

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

Singleton Horticulture Project

Fortune Agribusiness Funds Management Pty Ltd

Singleton Station, Barkly Region

August 2023

Proposal :	Singleton Horticulture Project
Proponent:	Fortune Agribusiness Funds Management Pty Ltd
NT EPA Reference:	NTEPA2022/0163
Location:	Singleton Station, Davenport, Northern Territory
Local Government Area:	Barkly Region
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: <http://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	22 August 2023 (for consultation)
TRM number	NTEPA2022/0163-012~0020

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1. Introduction

1.1. Overview

The *Singleton Horticulture Project* (the proposal) proposed by Fortune Agribusiness Funds Management Pty Ltd (FAFM) (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 \(NT EPA 2021\)](#).

A list of relevant guidance material and references is provided at Appendix A.

The proposal involves development of a large irrigated fruit and vegetable farm on Singleton Station, approximately 130 km south of Tennant Creek and about 35 km northeast of Ali Curung in the Barkly region.

The proposed activities, as outlined in the referral, include:

- clearing of 4,037 hectares of native vegetation on pastoral land
- development of 3,300 ha of irrigated crops
- groundwater extraction of up to 40,000 megalitres per year, from 144 bores, subject to development over four stages including gradual increase in extraction rates¹
- a services hub including:
 - accommodation for approximately 150 permanent staff and families, and up to 1,350 seasonal staff
 - packing facilities, cold storage and machinery workshops
 - telecommunications infrastructure
 - potential future power station
 - waste and water services
- access tracks, fences and fire breaks
- upgrade of power transmission from Tennant Creek.

The proponent has advised the NT EPA that the operational life of the farm is planned for 30 years¹.

Further details of the proposal and its assessment are on the [NT EPA's website](#). This includes:

- the referral, including extensive reporting on investigations already undertaken
- submissions received on the referral
- the notice of decision and statement of reasons for the NT EPA's decision for assessment by EIS.

¹ In accordance with groundwater extraction licence WDCP10358

1.2. Assessment context

Separate to the assessment under the EP Act, the proponent holds water extraction licence WDCP10358 for the proposal under the *Water Act 1992* and is progressing approvals for non-pastoral use and land clearing under the *Pastoral Land Act 1992*. This is in accordance with indicative [approvals mapping](#) by the Department of Environment, Parks and Water Security.

The proponent also holds authority certificate C2019/083, pursuant to the *Northern Territory Aboriginal Sacred Site Act 1989*, for proposed works associated with agricultural land use within Singleton Station. The authority certificate includes conditions stating no damage may occur to the sacred sites featured on the certificate. It does not cover areas and sacred sites outside of Singleton Station.

These TOR recognise the investigations undertaken to date, extensive information provided in the referral, and the existing regulatory instruments that apply to the proposal, and focus on the information required in the draft EIS to inform the NT EPA's assessment of potential significant impacts in accordance with the EP Act and EP Regulations.

Some of the information required by these TOR overlaps with information that the proponent is required to provide to meet conditions precedent of its water extraction licence. These are conditions that must be fulfilled prior to any water entitlement taking effect. For clarity, these overlaps are referenced throughout these TOR using footnotes pointing to Appendix B which provides further explanation on related condition precedent (CP).

1.3. Assessment period

The specified assessment period within which the draft EIS is to be submitted to the NT EPA, in line with regulation 99 of the EP Regulations, is two years from the date these TOR were issued. In determining this assessment period, the NT EPA has considered the matters listed under EP Regulation 99(3).

2. Matters to be addressed in the EIS

The EIS must address section 4 of the [NT EPA guidance: Preparing an environmental impact statement](#). Specific information requirements for this proposal are outlined below.

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 proponent, proposal lifespan, key components, development stages, activities, the potentially affected area, and appropriate map/s
- a summary of the key environmental values in the potentially affected area
- a summary of the potential environmental impacts of the proposal on the identified values
- a summary of measures to avoid, mitigate and offset (if applicable) potential impacts of the proposal, with a clear and measurable outcomes for environment protection
- a summary of the intended future use of the site and rehabilitation outcomes

- a summary of stakeholder engagement undertaken and commitments to future stakeholder engagement.

2.2. Proposal description

2.2.1. Operations

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

- summary table/s listing the key components of the proposal, and their maximum spatial extent or quantity, using appropriate parameters; including the matters outlined in Table 1
- any changes, amendments or refinements to the proposal or its components since submission of the referral²
- for any uncertainty in the detailed design, footprint, capacity or lifespan of the proposal or its components, a clear explanation of the approach to resolving this uncertainty.

Table 1 Minimum information requirements for the proposal description

Topic	Required information
Site layout maps	<p>Provide a high-quality contemporary aerial view of the proposal area to describe current site conditions including existing disturbance.</p> <p>Show the location and dimensions of the proposal components, clearly identifying the areas of:</p> <ul style="list-style-type: none"> • existing disturbance, infrastructure, roads/tracks, natural and modified landforms / landscape features • new disturbance and infrastructure, including: <ul style="list-style-type: none"> ○ all areas to be cleared and/or disturbed ○ designated horticultural plots ○ borefield ○ access roads and tracks ○ service corridors and firebreaks ○ windbreaks ○ accommodation village ○ services hub ○ other structures and facilities ○ stormwater drainage ○ wastewater management and disposal facilities ○ storage areas for chemicals and hazardous substances (including fuel) ○ waste storage and management facilities, including temporary stockpiles and permanent landfills

² Noting that the NT EPA must be formally notified of any significant variations under section 51 of the EP Act

Topic	Required information
Operation	<p>Describe all components and activities of the proposal, including:</p> <ul style="list-style-type: none"> • vegetation clearing and site preparation • infrastructure – location, size and type • facility functional design – 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 • chemicals and hazardous substances (including fuel) required - major types, quantities, and key hazards • proposal stages and timeframes, including the operational life of the farm
Water	<p>Describe all water requirements relevant to each proposal component and stage of development. Provide detailed information on demand/volume required, storage, and wastewater management. Demonstrate that the waste management hierarchy has been applied during the design of the proposal and will be applied to water management throughout the life of the proposal. Provide an overall site water balance for the proposal.</p>
Transport and traffic	<p>Provide a summary of traffic and transport activities, and their management, including any update on the information provided in the referral (section 7.6.1 and Appendix V).</p>
Energy	<p>Provide relevant information including:</p> <ul style="list-style-type: none"> • energy requirements, source/s, and upgrade of existing infrastructure • options for sourcing energy from renewable sources, with a preferred option and justification for the selected option
Waste	<p>Describe the overarching approach to waste management, confirming the key waste infrastructure that will be used³.</p> <p>Describe the proposed onsite waste management and storage facilities for all waste streams including waste horticultural produce. Include capacity, location, site-selection considerations, and measures to contain any leachate or gases.</p> <p>Demonstrate that the waste management hierarchy has been applied during the design of the proposal and will be applied to waste management throughout the life of the proposal.</p>
Workforce	<p>Provide a summary of the following, for each proposal stage:</p> <ul style="list-style-type: none"> • estimated number of permanent and seasonal employees and contractors • estimated number of people to be accommodated on site, including families of employees and contractors • skills base required • likely sources (local, regional, Australia-wide, overseas) • proposed on-site facilities for employees

³ Noting that Appendix B of the referral suggested consideration of a lined onsite landfill, a waste transfer station, and an onsite organics processing facility.

2.2.2. Potentially affected area

Delineate the potentially affected area of the proposal, taking into account the area of proposed works plus all areas of potential impact from groundwater drawdown (maximum extent), potential increased salinity and potential downstream effects, with a suitable buffer to allow for uncertainty.

Provide maps showing:

- the extent of this potentially affected area alongside key regional features.
- current land tenure, land use, and native title in the potentially affected area
- other interests in land such as minerals and petroleum
- sensitive environment, including towns, communities, homesteads and residences and any sites of conservation significance within the potentially affected area.

2.2.3. Proponent

Provide information about the proponent including:

- experience in the agricultural industry
- any environmental history
- partnerships with other organisations or industries as part of the proposal
- notification/disclosure of offences, or any non-compliances with state/territory or Commonwealth environmental approval conditions.

2.2.4. Alternatives

Provide a discussion on alternative horticultural practices that have been considered, in the context of:

- addressing the principle of sustainable use including in relation to water-use
- addressing the environmental decision-making hierarchy
- accounting for uncertainty of securing increases in staged water entitlements.

2.2.5. Restoration

Describe actions that will be taken to manage land within Singleton Station and reduce existing threatening processes, as committed to in section 7.1.2.4 and relevant appendices of the referral, and with reference to section 2.4.2 of these TOR.

2.2.6. Transition to post-proposal land-use

Provide information on the transition to future land-use following cessation of the proposal. This is to include:

- intended future land-use/s in accordance with the *Pastoral Land Act 1992*
- arrangements for the transition to the new land-use in the cases of:
 - planned cessation of the proposal

- unplanned early cessation of the proposal, for any reason including inability to secure increases in staged water entitlements
- concept map/s indicating future land-use/s of the proposal area and any infrastructure that may remain
- a description of any legacy benefits of the proposal to the community such as renewable power and water supply
- a description of decommissioning and rehabilitation of the land, including any rehabilitation objectives
- where rehabilitation objectives do not include returning land to a natural and/or stable state, explanation of why and outline methods to identify and achieve best outcomes
- provisions to finance the transition to future land-use in the event of planned or unplanned proposal cessation.

2.3. Stakeholder engagement and consultation

The EIS is to document the following:

- the proponent's approach to stakeholder engagement and consultation for the life of the proposal⁴, including demonstration that this is consistent with the NT EPA's guidance for proponents: [Stakeholder Engagement and Consultation \(NT EPA 2021\)](#) and aligns with best-practice guidance⁵
- a summary of information presented in the referral on consultation undertaken up until mid-2022, including identified stakeholder groups, key issues raised, and adjustments made to the proposal as a result of consultation.
- details of further stakeholder engagement and consultation undertaken on the proposal, including with Aboriginal stakeholders as outlined in section 2.3.1 below, with detail on:
 - additional identified stakeholders
 - the manner in which information has been disseminated and communicated to stakeholders, and how stakeholder input was invited and incorporated
 - key issues raised in consultations
 - any adjustments to the proposal as a result of consultation

2.3.1. Aboriginal stakeholders

The EIS is to be informed by consultation with Aboriginal stakeholders. The EIS should set out the processes applied to identifying and determining Aboriginal stakeholders.

Aboriginal stakeholders must include:

⁴ Inclusion of a stakeholder engagement plan would be appropriate, noting that the referral indicated that the proponent intends to prepare a Community and Stakeholder Engagement Strategy for future consultation.

⁵ For example: [NSW Social Impact Assessment Guideline](#) (2021) that was used by the proponent in preparation of the social impact assessment included in the referral (Appendix I).

- native title holders of Singleton Station, whose prescribed body corporate is the Mpwerempwer Aboriginal Corporation
- native title holders of Neutral Junction Station, within whose prescribed body corporate is the Kaytetye Tywerate Arengge Aboriginal Corporation
- traditional Aboriginal owners whose lands are within the potentially affected area, including the Iliyarne, Warrabri and Karlantijpa South Aboriginal Land Trusts, administered by the Central Land Council
- other people or organisations determined to be Aboriginal stakeholders.

The EIS is to describe the Aboriginal stakeholders and demonstrate how the proponent has:

- recognised the role of Aboriginal people as stewards of their country
- recognised the rights and interests of Aboriginal stakeholders in the area of potential impact, and encouraged their participation in environmental decision-making in relation to the proposal
- engaged with Aboriginal stakeholders in a culturally appropriate manner, using specialist expertise where required
- provided Aboriginal stakeholders with information in appropriate detail, language and format⁶ for understanding of the proposal and its potential impacts and benefits
- promoted the cooperative use of Aboriginal knowledge of biodiversity and Aboriginal culture in environmental decision-making
- treated the views of Aboriginal stakeholders as the primary source of information on Aboriginal cultural values
- discussed options with, and obtained the views of, Aboriginal stakeholders in regards to environmental management
- adopted measures to protect the rights and interests of Aboriginal people in relation to the areas that may be impacted.

2.4. Environment protection and management requirements

Provide information that demonstrates, in accordance with section 42(b) of the EP Act, that the proposal is assessed, planned and will be carried out taking into account the following:

2.4.1. Principles of ecologically sustainable development

Substantiate predicted outcomes in relation to the principles of ecologically sustainable development as set out in Part 2, Division 1, of the EP Act.

2.4.2. Management hierarchies

Summarise how the environmental decision-making hierarchy (section 26 of the EP Act) and the waste management hierarchy (section 27 of the EP Act) have been applied in the design of the proposal and will

⁶ Provide descriptions and possibly examples of any specialist materials used

continue to be applied in the development and operation of the proposed action. Draw on details reported in response to Table 1, and in the assessment of environmental factors in section 2.5, of these TOR.

2.4.3. Ecosystem-based management

Describe how ecosystem-based management⁷ has been taken into account in the design of all components of the proposal and the proposed mitigation and management measures. Include consideration of residual impacts (section 2.5) and justification for whether they are acceptable.

2.4.4. The impacts of a changing climate

Provide a summary of the projected climate changes in the region, referring to relevant publications.

Describe how adaptation to a changing climate has been considered in the design of the proposal.

In assessing the environmental factors (section 2.5 of these TOR, and applying relevant references – see Appendix A), include the effect of projected climate changes on identified environmental values, and on mitigation measures.

2.5. Information requirements for environmental factors

Table 2 identifies the environmental factors⁸ that must be addressed in the EIS.

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

THEME	FACTOR	ENVIRONMENTAL OBJECTIVE
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.
	Inland water environmental quality	Protect the quality of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained.
Land	Terrestrial environmental quality	Protect the quality and integrity of land and soils so that environmental values are supported and maintained.
	Terrestrial ecosystems	Protect terrestrial habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.
Air	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	Community and economy	Enhance communities and the economy for the welfare, amenity and benefit of current and future generations of Territorians.
	Culture and Heritage	Protect culture and heritage.

⁷ As defined in section 4 of the EP Act

⁸ NT EPA's [Environmental factors and objectives – Environmental impact assessment guidance](#)

For each of the factors listed in Table 2, the draft EIS should identify and examine:

- potential impacts of the proposal with reference to section 10 of the EP Act, including cumulative impacts in consideration of other known or proposed activities in the region, potential natural disasters such as fire, flood or drought, and the influence of a changing climate
- the significance of the identified potential impacts with reference to section 11 of the EP Act⁹, including consideration of non-standard operations.

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 outline the information to be addressed in the draft EIS for the preliminary environmental factors (Table 2). For each environmental factor addressed, the draft EIS is to include (as applicable) appropriately detailed maps and figures to support the descriptions and findings, with any technical assessment reports as appendices.

2.5.1. Hydrological processes

The context for this factor assessment is the potential for the proposal to significantly impact environmental values associated with this and other factors, due to groundwater extraction and associated changes in the hydrological regime of groundwater.

The draft EIS is to cover all matters in Table 3 for addressing the NT EPA objective for this factor: 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.

Table 3 Minimum information required for the assessment of Hydrological processes

Aspect	Specific information required
Environmental values	<p>Describe the existing groundwater regime in the potentially affected area. This is to expand on section 5.8.1 of the referral and include reference to field investigations on aquifer characteristics¹⁰. Include:</p> <ul style="list-style-type: none"> • map/s of depth to groundwater (of the source aquifer of water extraction) over the area of potential impact, including an indication of short- and long-term variability • information on groundwater flow direction and rates • information on hydrological connectivity, including with the ground surface via springs, swamps, groundwater dependent ecosystems, or other • information on recharge zones, rates and variability. <p>Report on the occurrence of stygofauna, classified into taxonomic groups, based on field sampling and assessment of existing bores and new bores associated with the water resource assessment outlined below.</p>

⁹ Having regard to the context and intensity of the impact; and the sensitivity, value and quality of the environment impacted on and the duration, magnitude and geographic extent of the impact.

¹⁰ See Appendix B – CP 9

Aspect	Specific information required
<p>Potential significant impacts and risks</p>	<p>Update the groundwater model¹¹ taking into account results of field investigations and any update to the borefield design. Report on assumptions and parameters used in the model, and justification for their use, referring to relevant literature.</p> <p>Discuss the drawdown predictions derived from the groundwater model and how these may change in the event critical assumptions (including transmissivity, hydraulic conductivity and porosity) were found to be incorrect.</p> <p>Document the predicted effects of groundwater extraction on the groundwater hydrological regime. Quantify the significance and extent of impacts at the proposal level and cumulatively with other approved and proposed water extraction in the Western Davenport Water Control District.</p> <p>Predictions are to address the following across the proposal area and drawdown area:</p> <ul style="list-style-type: none"> • changes to groundwater levels, including spatial and temporal variation • groundwater flow direction and rates • groundwater level recovery-time following the cessation of water extraction <p>Predictions should consider the maximum expected water extraction and account for variability in the natural system, based on available data and including scenarios for extended periods of dry, average, and wet conditions, represented by ten, fifty and ninety percent probabilities of rainfall. The methodology for doing this is to be developed in consultation with the Water Resources Division of the Department of Environment, Parks and Water Security (DEPWS).</p> <p>Provide the following predictive outputs for maximum water extraction compared with the natural system:</p> <ul style="list-style-type: none"> • maps of groundwater drawdown contours at 5-yearly intervals • drawdown levels at key receptors. <p>Provide an independent peer review of the groundwater model and predictions derived from it and detail any changes made to the proposal as a result of the peer review.</p> <p>Discuss the potential impacts from groundwater extraction on the occurrence of stygofauna.</p> <p>Describe any uncertainties and further work required to increase understanding of the changes to the hydrological regime and potential impacts to the occurrence of stygofauna.</p>
<p>Avoidance, mitigation and management</p>	<p>Conduct a robust analysis of the impacts of new alternative borefield designs including expanding the area of the borefield or splitting the borefield into multiple smaller fields. Report on the borefield designs considered and demonstrate how the selected option is preferable on environmental impact grounds, or justify why the lowest impact option was not selected.</p> <p>Provide an updated adaptive management plan¹² that is detailed, specific and comprehensive, in accordance with NT EPA's guidance on adaptive management and addressing potential impacts from alterations to the hydrological regime on environmental values identified in the draft EIS.</p>

¹¹ Expected to be class II model in accordance with: Barnett et al, 2012, [Australian groundwater modelling guidelines](#), Waterlines report, National Water Commission, Canberra.

¹² See Appendix B – CP 7

Aspect	Specific information required
	<p>Demonstrate that mitigation measures align with best-practice and advice from relevant government advisory authorities.</p> <p>Provide an independent peer review of the updated adaptive management plan, and detail any changes made to the plan as a result of the peer review.</p>
Monitoring and reporting	<p>Provide a robust monitoring and reporting plan¹³ relating to changes to the hydrological regime. This may be part of, or linked with, the adaptive management plan, and must:</p> <ul style="list-style-type: none"> • specify monitoring parameters, locations, and frequency of monitoring across proposal stages • demonstrate that the proposed monitoring locations are appropriately sited for access by the proponent and for monitoring potentially significant impacts • demonstrate that monitoring and reporting activities align with best practice and advice from relevant government advisory agencies.
Residual impact	<p>Explain how the NT EPA's objective, to 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, will be met.</p> <p>Identify any significant residual impact of the proposal on the hydrological regime and dependent environmental values.</p>

2.5.2. Inland water environmental quality and terrestrial environmental quality

The context for the assessment of these factors is the potential for the proposal to significantly impact inland water environmental quality and terrestrial environmental quality through irrigation salinity, changes to the hydrological regime, earth disturbance, erosion, and the release of agricultural chemicals.

The EIS is to cover all matters in Table 4 for addressing the NT EPA objectives for this factor to protect:

- the quality of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained
- the quality and integrity of land and soils so that environmental values are supported and maintained.

Table 4 Minimum information required for the assessment of Inland water environmental quality and terrestrial environmental quality

Aspect	Specific information required
Environmental values	<p>Provide a map/s showing groundwater and surface water systems in the potentially affected area.</p> <p>Document the following, using appropriate parameters for physical, chemical and biological characteristics:</p> <ul style="list-style-type: none"> • soil types and quality (including salinity) based on field observations in the proposal area

¹³ See Appendix B – CP 8

Aspect	Specific information required
	<ul style="list-style-type: none"> • groundwater quality, based on field observations in the potentially affected area • surface water quality in the potentially affected area. <p>Appropriately reference and analyse the field studies and other information used in the assessment.</p>
<p>Potential significant impacts and risks</p>	<p>Update the salinity assessment reported in Appendix L of the referral¹⁴. The update is to:</p> <ul style="list-style-type: none"> • incorporate field observations • take into account salts in the leached irrigation water • assess the cumulative impacts of accumulated salts over the life of the proposal • account for how regional groundwater flow may be affected by climate fluctuations. <p>Determine the rate and direction of movement of the salt plume using a 3-D solute transport model.</p> <p>Quantify predicted changes to salinity that may result from the proposal. Discuss the likelihood and extent of salinity impacts. Include maps and/or diagrams illustrating any substantial predicted increase in salinity, with a focus on areas where vegetation may access the water and/or soil.</p> <p>Assess the potential significant impacts from the proposal on soil, surface water and groundwater quality from earth disturbance, erosion, and the release of agricultural chemicals via infiltration or runoff. This assessment is to take into consideration:</p> <ul style="list-style-type: none"> • spatial and temporal trends in climate, including predicted climate change • the chemical characteristics of agricultural chemicals • baseline conditions and identified environmental values • current stressors and cumulative impacts with other proposals or activities in the region. • site specific water quality data and any relevant guideline thresholds including ANZECC & ARM CANZ 2018 • reversibility of potential impacts. <p>Discuss potential significant impacts on the occurrence of stygofauna from any alteration of water quality, including salinity, and provide an assessment of the significance of these impacts.</p> <p>Describe a process for identifying future unanticipated significant impacts. Refer to any relevant sections and content of an updated adaptive management plan.</p>
<p>Avoidance, mitigation and management</p>	<p>Describe the measures for avoiding, mitigating and managing impacts on land and water environmental quality.</p> <p>Include consideration of measures to prevent the accumulation of salts in soil and water beneath the irrigation area.</p> <p>Demonstrate the application of the environmental decision-making hierarchy to avoid and minimise impacts on land and water environmental quality.</p> <p>Demonstrate that mitigation measures align with best practice and advice from relevant</p>

¹⁴ See Appendix B – CP 6

Aspect	Specific information required
	<p>government advisory agencies.</p> <p>Where avoidance, mitigation and management measures form part of the adaptive management approach, refer to any relevant sections and content of an updated adaptive management plan.</p> <p>To take account of any uncertainty on the existence of values or potential impacts on known values, demonstrate how management measures meet the precautionary principle (section 19 of EP Act).</p>
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential significant impacts to land and water environmental quality, and measures for their mitigation and management.</p> <p>Demonstrate that monitoring and reporting activities align with best practice, and are consistent with advice from relevant government advisory agencies.</p> <p>Where monitoring and reporting activities form part of the adaptive management approach, refer to any relevant sections and content of an updated adaptive management plan.</p>
Residual impact	<p>Explain how the NT EPA's objective, to protect the quality of groundwater and surface water and to protect the quality and integrity of land and soils so that environmental values are maintained, will be met.</p> <p>Identify any significant residual impact of the proposal to land, soil and water quality values.</p>

2.5.3. Terrestrial ecosystems

The context for this assessment is largely the anticipated changes to the hydrological regime as a result of the proposal, as addressed in section 2.5.1 of these TOR. In addition, potential impacts on inland water environmental quality and terrestrial environmental quality have the potential to values associated with this factor.

The EIS is to cover all matters in 5 for addressing the NT EPA objective for this factor: to protect the NT's flora and fauna so that environmental values including biological diversity and ecological integrity are maintained.

Table 5 Minimum information required for the assessment of Terrestrial ecosystems

Aspect	Specific information required
Environmental values	<p>Provide updated information on groundwater dependent ecosystems (GDEs)¹⁵. The update is to:</p> <ul style="list-style-type: none"> • be informed by on-ground surveys • be prepared by a suitably qualified professional • draw on studies of the groundwater system • include information on:

¹⁵ See Appendix B – CP 5

Aspect	Specific information required
	<ul style="list-style-type: none"> ○ spatial extent of GDEs in the potentially affected area ○ the source of water sustaining the GDEs ○ metrics indicating the condition and value of GDEs¹⁶ <p>Document the location of any sensitive and significant vegetation and wetlands¹⁷ within the potentially affected area.</p>
Potential significant impacts and risks	<p>Provide a summary of all pathways of potential significant impact on the identified terrestrial ecosystem values including:</p> <ul style="list-style-type: none"> • drawdown of the water table – effects on GDEs • potentially increased groundwater salinity – effects on GDEs, sensitive and significant vegetation, and wetlands <p>Using appropriate studies, investigations and relevant information, quantify the extent of potential impacts and their significance locally and regionally.</p> <p>Describe a process for identifying future unanticipated impacts. If this forms part of the adaptive management approach, refer to any relevant sections and content of an updated adaptive management plan.</p>
Avoidance, mitigation and management	<p>Provide an updated adaptive management plan¹⁸ that includes measures for avoiding, mitigating and managing impacts on GDEs, sensitive and significant vegetation, and wetlands.</p> <p>Demonstrate the application of the environmental decision-making hierarchy to avoid and minimise impacts on GDEs. This should include consideration of alternative borefield designs and consideration of alternative cropping.</p> <p>Demonstrate that mitigation measures align with best practice and advice from relevant government advisory agencies.</p>
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential significant impacts to terrestrial ecosystem values, and measures for their mitigation and management. Specify monitoring (parameters, methodology and frequency) and reporting activities.</p> <p>Demonstrate that monitoring and reporting activities align with best practice, and are consistent with advice from relevant government advisory agencies.</p> <p>Where monitoring and reporting activities form part of the adaptive management approach, refer to any relevant sections and content of the updated adaptive management plan.</p> <p>Describe clear and measurable outcomes and commitments that will ensure the environmental objective is met and impacts of implementing the proposal will be acceptable.</p>
Residual impact	<p>Explain how the NT EPA’s objective, to protect the NT’s flora and fauna so that environmental values including biological diversity and ecological integrity are maintained, will be met.</p> <p>Identify any significant residual impact of the proposal to terrestrial ecosystem values.</p>
Offsets	<p>Where a significant residual impact may remain after applying the environmental decision-making hierarchy, identify offsets such as measures to enhance or restore</p>

¹⁶ To be used as a baseline for detecting potential impacts from groundwater drawdown

¹⁷ Refer to NT Land Clearing Guidelines (DENR 2019).

¹⁸ See Appendix B – CP 7

Aspect	Specific information required
	ecosystems. Describe how any proposed offset is consistent with the NT Offsets Framework , where relevant.

2.5.4. Atmospheric processes

The context for this factor assessment is the potential for the proposal to significantly affect greenhouse gas emissions in the Territory through land clearing, energy consumption, fuel combustion, growing crops, impacts to GDEs, and restoration activities.

The EIS is to cover all matters in Table 6 for addressing the NT EPA objective for this factor: Minimise greenhouse gas emissions so as to contribute to the NT Government's target of achieving net zero greenhouse gas emissions by 2050.

Table 6 Minimum information required for the assessment of atmospheric processes

Aspect	Specific information required
Environmental values	Describe the current and projected greenhouse gas emissions profile from cropland and horticultural production in the NT.
Potential impacts and risks	Provide details on the projected emissions intensity from the proposal (emissions for each activity type) and benchmarking against other comparable projects, industry standards and best practice.
Avoidance, mitigation and management	Outline any proposal-specific greenhouse gas reduction targets. Outline the measures proposed for reducing greenhouse gas emissions from the proposal so as to contribute to the Northern Territory's target of net zero by 2050. Describe the proposal's contribution to meeting NT renewable energy targets. Demonstrate that proposed measures are in accordance with best-practice and capable of achieving stated emissions reductions, in accordance with the Northern Territory's Climate Change Response. This is to address any local conditions or circumstances that might influence the choice of technologies or measures to mitigate emissions.
Monitoring and reporting	Outline any proposed monitoring and reporting of greenhouse gas emissions.
Residual impact	Describe the net contribution to the NT's greenhouse gas emissions over the life of the proposal. Explain how the proposal will contribute to the NT EPA's objective to minimise greenhouse gas emissions so as to contribute to the NT Government's target of achieving net zero greenhouse gas emissions by 2050.

2.5.5. Community and economy

The context for this factor assessment is the potential for the proposal to significantly affect the welfare and amenity of people in the region due to community and economic changes through new infrastructure, groundwater drawdown, social and physical interactions, employment opportunities, and increased economic activity.

The EIS is to cover all matters in Table 7 for addressing the NT EPA objective for this factor: Enhance communities and the economy for the welfare, amenity and benefit of current and future generations of Territorians.

Table 7 Minimum information required for the assessment of community and economy

Aspect	Specific information required
Environmental values	Provide a summary of the community and economic values that could be affected by the proposal, referring to the social impact assessment and the economic assessment provided in the referral (appendices I and J respectively), and including any additional community and economic values identified through stakeholder engagement undertaken for the draft EIS.
Potential significant impacts and risks	Provide a summary of the assessment of the potential significant impacts and risks, along with the social and economic benefits to the local and NT community and economy from the proposal, referring to the relevant assessments provided in the referral.
Avoidance, mitigation and management	<p>Provide a social impact management plan (SIMP) that:</p> <ul style="list-style-type: none"> • includes management measures to avoid, mitigate and manage potential significant social and economic impacts and enhance benefits • outlines the roles and responsibilities of the proponent, its contractors and other stakeholders for implementation of the identified social and economic mitigation and management measures throughout the life of the proposal • includes a framework for monitoring the effectiveness of the proposed avoidance, mitigation and management measures, and • addresses the following: <ul style="list-style-type: none"> ○ community benefit plan ○ local and Indigenous employment and procurement plan ○ workforce management plan and accommodation strategy, informed by an analysis of social needs¹⁹ of the workforce ○ emergency management plan ○ traffic management plan ○ transition to future land-use/s: management of impacts on workers and the local community. <p>Demonstrate that proposed mitigation and management measures are in accordance with best-practice, including advice from relevant NT Government authorities.</p> <p>Demonstrate that the assessment of the impacts and benefits of the proposal on potentially affected community is informed by an inclusive and collaborative community and stakeholder engagement and consultation process that is iterative throughout preparation of the EIS.</p> <p>Where avoidance, mitigation and management measures form part of the adaptive management approach, refer to any relevant sections and content of an updated adaptive management plan.</p>

¹⁹ E.g. built-environment, education, health, safety, recreation and community connection

Aspect	Specific information required
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential significant impacts and risks to community and economy, and measures for their mitigation and management.</p> <p>Demonstrate that monitoring activities align with community expectations and are in accordance with best-practice, including advice from relevant NT Government authorities.</p>
Residual impact	<p>Explain how the NT EPA's objective, to enhance communities and the economy for the welfare, amenity and benefit of current and future generations of Territorians, will be met.</p> <p>Identify any significant residual impact of the proposal to social and economic values.</p>

2.5.6. Culture and heritage

The context of this factor assessment is the potential for significant impacts to cultural values from the proposal as a result of changes to hydrological processes, inland water environmental quality, terrestrial environmental quality, and community and economy.

The EIS is to cover all matters in Table 7 for addressing the NT EPA objective for this factor: to protect culture and heritage.

Table 8: Information required for assessment of Culture and heritage.

Aspect	Specific information required
Environmental values	<p>Describe the characteristics and current condition of Aboriginal cultural values²⁰ which could be impacted by the proposal within the potentially affected area. This must include (at a minimum) descriptive information²¹ for the following:</p> <ul style="list-style-type: none"> Aboriginal stakeholders' connection to land and waters, in terms of traditional laws and customs sites, places or objects of Aboriginal cultural significance land use by Aboriginal stakeholders importance of amenity (e.g., visual, noise) to maintaining Aboriginal cultural values importance of terrestrial ecosystems (including groundwater dependent ecosystems) and biodiversity to maintaining Aboriginal cultural values <p>Information must be based on engagement with Aboriginal stakeholders²² and the Central Land Council, published archaeological and anthropological information, site surveys, respective registers, and other research.</p> <p>Presentation of information must accord with the wishes of Aboriginal stakeholders regarding the confidentiality of cultural information, noting that the proponent may</p>

²⁰ See Appendix B – CP 10

²¹ Including spatial information where relevant

²² Undertaken by suitably qualified professionals or organisations.

Aspect	Specific information required
	<p>request that identified information not be made public in accordance with section 281(2)(b) of the EP Act.</p> <p>Explain the suitability of the methodologies, surveys or processes used to provide information about Aboriginal cultural values. Detail any information gaps or uncertainties in relation to Aboriginal cultural values, including any further studies or measures required to address these gaps.</p>
<p>Potential significant impacts and risks</p>	<p>Describe potential significant impacts on Aboriginal cultural values, including those arising from:</p> <ul style="list-style-type: none"> • disturbance to sites, places or objects of cultural significance²³ due to construction and operation activities (including proposed mitigation or management activities) • changes to amenity due to construction and operation activities • temporary or permanent land access or use restrictions in areas of proposal infrastructure and operations • changes to terrestrial ecosystems and biodiversity due to construction and operation activities, including groundwater drawdown or salinity. <p>This is to be based on engagement with Aboriginal stakeholders and informed by scientific studies of the biophysical environment and the potential impacts to it from this proposal.</p> <p>The assessment must:</p> <ul style="list-style-type: none"> • document the nature and significance of the impacts • consider the reversibility of potential impacts • assess the potential cumulative impacts from the proposal and other reasonably related past, present and reasonably foreseeable future activities in the region, combined with the potential impacts of a changing climate. <p>Describe a process for identifying future unanticipated impacts. If this forms part of the adaptive management approach, refer to any relevant sections and content of an updated adaptive management plan.</p>
<p>Avoidance, mitigation and management</p>	<p>Describe the measures for avoiding, mitigating and managing potential significant impacts on Aboriginal cultural values.</p> <p>Demonstrate the application of the environmental decision-making hierarchy to avoid and minimise impacts on Aboriginal cultural values.</p> <p>Demonstrate that mitigation measures align with best practice, including advice from relevant government advisory agencies and Aboriginal stakeholders and/or their representatives. Where avoidance, mitigation and management measures form part of the adaptive management approach, refer to any relevant sections and content of an updated adaptive management plan.</p> <p>To take account of any uncertainty on the existence of values or potential impacts on known values, demonstrate how management measures meet the precautionary principle (section 19 of EP Act).</p>

²³ Including, but not limited to, sacred sites

Aspect	Specific information required
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential significant impacts and risks to Aboriginal cultural values, and measures for their mitigation and management. Where relevant, specify monitoring and reporting activities for various proposal stages.</p> <p>Demonstrate that monitoring and reporting activities align with best practice, and are consistent with advice from Aboriginal stakeholders and relevant government advisory agencies.</p> <p>Where monitoring and reporting activities form part of the adaptive management approach, refer to any relevant sections and content of an updated adaptive management plan.</p>
Residual impact	<p>Explain how the NT EPA's objective to protect culture and heritage will be met.</p> <p>Identify any significant residual impact of the proposal to Aboriginal cultural values.</p>

3. 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.

3.1. 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.

3.2. Manner in which to publish

The draft EIS must be provided as:

- accessible PDF files that do not exceed 20MB
- nine (9) printed copies for display at the locations in section 4.4 below.

The draft EIS must:

- be divided into 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](#).

3.3. Advertising

An advertisement must be placed in the NT News 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.

3.4. Public consultation locations

The draft EIS should be provided to and be made available for public consultation at:

- Mirrirri Store, 5 Jungarrayi Street, Ali Curung, NT 0872
- Tennant Creek Public Library, Barkly Regional Council, 41 Peko Road, Tennant Creek NT 0860
- Central Land Council, 27 Stuart Highway, Alice Springs NT 0870
- Alice Springs Public Library, Gregory Terrace, Alice Springs NT 0870
- Arid Lands Environment Centre, 90 Gap Road, The Gap, NT 0870
- Northern Territory Library, Parliament House, Darwin, NT 0800
- Primary Industries office, Arid Zone Research Institute (AZRI) Main Building, 519 South Stuart Highway, Alice Springs NT 0870
- Primary Industries office, Ground Floor, John England Building, 29 Makagon Road, Berrimah Farm Science Precinct, Berrimah NT 0828
- NT EPA, Level 1, Arnhemica House, 16 Parap Road, Parap, NT 0820

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.

- ANZECC & ARMCANZ 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. <https://www.waterquality.gov.au/anz-guidelines>
- 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
- 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
- DEPWS, 2021. Northern Territory Offsets Framework. <https://depws.nt.gov.au/environment-information/northern-territory-offsets-framework/northern-territory-offsets-framework>
- DEPWS, 2023. Biodiversity Offsets Policy. https://depws.nt.gov.au/_data/assets/pdf_file/0003/1182450/biodiversity-offsets-policy.pdf
- Donaldson, S.D. 2021. Singleton water licence Aboriginal cultural values assessment – public report. Appendix L of the Central Land Council submission to the NT EPA on the Singleton Horticulture Project referral. <https://www.clc.org.au/submission-to-the-northern-territoryenvironmental-protection-agencysingleton-horticulture-projectreferral-of-proposed-action-submitted-by-fortune-agribusinessfunds-management-pty-ltd-andpublished-by-t/>
- Donaldson, S.D. 2023. Addendum: Aboriginal cultural values impact assessment – Singleton water licence drawdown area. Appendix M of the Central Land Council submission to the NT EPA on the Singleton Horticulture Project referral. <https://www.clc.org.au/submission-to-the-northern-territoryenvironmental-protection-agencysingleton-horticulture-projectreferral-of-proposed-action-submitted-by-fortune-agribusinessfunds-management-pty-ltd-andpublished-by-t/>
- 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/>
- 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 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, 2017. Guideline: Recommended Land Use Separation Distances. https://ntepa.nt.gov.au/_data/assets/pdf_file/0006/453192/guideline_recommended_land_separation_distances_oct.pdf
- NT EPA, 2018. Guidance on Adaptive Management. https://ntepa.nt.gov.au/_data/assets/pdf_file/0003/622092/guideline_adaptive_management.pdf
- 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, 2022. Waste. <https://ntepa.nt.gov.au/your-environment/waste>
- NT EPA, 2023. Singleton Horticulture Project. Northern Territory Environment Protection Authority: https://ntepa.nt.gov.au/_data/assets/pdf_file/0017/1214441/notice-of-decision-and-statement-of-reasons-singleton-referral.pdf

Appendix B – Information requirements of the water extraction licence compared with these TOR

The proponent holds water extraction licence WDCP10358 for the proposal under the *Water Act 1992*. This licence contains ten 'conditions precedent' that must be fulfilled prior to any water entitlement taking effect. Six of these conditions precedent require information to be provided to, and/or approved by, the Controller of Water Resources (the Controller), and much of this overlaps with information required in the draft EIS, as specified in these TOR. For clarity, Table 9 replicates the six relevant conditions precedent of the water extraction licence and, for each, identifies the related information required by these TOR, noting any differences.

Table 9: Comparison of information requirements in relevant conditions precedent of water extraction licence WDCP10358 and these TOR

Condition Precedent (CP) replicated from water extraction licence WDCP10358 ²⁴	Relevant section of TOR	Relationship between information requirements
CP 5 The licence holder must prepare for approval by the Controller:	Various, as below	As outlined below
(a) A map (and spatial data), verified through suitable on-ground surveys, of: (i) Aboriginal cultural values identified in CP 10 (as appropriate); and	2.5.6 Table 8 Environmental values	This map and spatial data would address part of the requirement for a description of Aboriginal cultural values. The TOR has further information requirements; as mentioned below in relation to CP 10.
(ii) groundwater dependent ecosystems in each landform on Singleton Station (NT Portion 653) in the Aeolian sandplain and alluvial plain areas shown in Figure 7.2 provided in Attachment A of this licence. The spatial data must be provided as a shapefile. The guideline: <i>Spatial data minimum requirements for clearing of native vegetation</i> should be used for guidance on the minimum requirements and attributes for the shapefile.	2.5.3 Table 5 Environmental values	This map and spatial data would address part of the requirement for updated information on GDEs. The TOR has further information requirements for information relating to terrestrial ecosystems.
(b) Maps (and shapefiles) demonstrating the modelled spatial extent of predicted impact on groundwater levels and to the Aboriginal cultural values identified at CP 10 and groundwater dependent ecosystems mapped in CP 5(a) at 5 yearly intervals for a minimum of 40 years. (c) Should the extent of predicted impact mapped in CP 5(b) exceed the limits established under	2.5.1 Table 3 Potential significant impacts and risks	At (b), (c)(ii), and/or (c)(iv), the required maps would address the requirement for predictive maps and drawdown levels at key receptors. The TOR has further information requirements for assessing the potential significant impacts and risks related to hydrological

²⁴ As amended 1 June 2023; originally issued 15 November 2021 and commenced 1 December 2021

Condition Precedent (CP) replicated from water extraction licence WDCP10358 ²⁴	Relevant section of TOR	Relationship between information requirements
<p>CP 10(d) or the limits outlined in the Guideline the licence holder must either submit:</p>		<p>processes.</p>
<p>(i) a revision of the bore field design (Figure 5.3 provided in Attachment B of this licence) and model pump file (pumping schedule) for the revised bore field design; and</p>	<p>2.5.3 Table 5 Potential significant impacts and risks</p>	<p>At (b), (c)(ii), and/or (c)(iv), the required maps would address part of the requirement for quantifying the extent of impacts on GDEs via drawdown of the water table.</p>
<p>(ii) maps (and shapefiles) based on the revised bore field design in CP 5(c)(i), demonstrating the modelled spatial extent of predicted impact to the Aboriginal cultural values identified at CP 10 and the groundwater dependent ecosystems mapped in CP 5(a) at 5 yearly intervals for a minimum of 40 years meet the protection limits outlined in the Guideline. This map replaces the maps prepared under CP 5(b).</p>	<p>2.5.6 Table 8 Potential significant impacts and risks</p>	<p>At (b), (c)(ii), and/or (c)(iv), the required maps would address part of the requirements to describe and document the potential significant impacts and risks to Aboriginal cultural values.</p>
<p>OR</p>	<p>2.4.2 Management hierarchies</p>	<p>At (c)(i) or (c)(iii) a revision of the borefield design or a revised pumping schedule would help demonstrate application of the environmental decision-making hierarchy.</p>
<p>(iii) a revised pumping schedule and model pumping file for the existing bore field design (Figure 5.3 provided in Attachment B of this licence); and</p>	<p>2.5.1 Table 3 avoidance, mitigation and management</p>	<p>At (c)(i) a revision of the bore field design would also contribute to demonstrating that the chosen borefield layout presents a lower risk of significant impacts than other alternatives considered.</p>
<p>(iv) maps (and shapefiles) based on the revised pumping schedule in CP 5(c)(iii), demonstrating the modelled spatial extent of predicted impact to the Aboriginal cultural values identified at CP 10 and the groundwater dependent ecosystems mapped in CP 5(a) at 5 yearly intervals for a minimum of 40 years meet the protection limits outlined in the Guideline. This map replaces the maps prepared under CP 5(b).</p>	<p>CP 6 2.5.4 Table 4 Potential significant impacts and risks</p>	<p>The assessment of the potential salinity impacts would address the requirement for an update of the salinity assessment.</p>
<p>The assessment and report must include:</p> <p>(a) a detailed characterisation of the soil and unsaturated zone properties including permeability, hydraulic conductivity and vertical salt loads;</p>	<p>2.5.2 Table 4 Environmental values</p>	<p>This would address at least part of the requirement for documenting the characteristics of soil, if based on field observations.</p> <p>These TOR have additional requirements for documenting groundwater quality and surface</p>

Condition Precedent (CP) replicated from water extraction licence WDCP10358 ²⁴	Relevant section of TOR	Relationship between information requirements
		water quality in the potentially affected area.
(b) a detailed investigation of site specific environmental factors, such as evapotranspiration and rainfall, which includes salt transport in the unsaturated zone;	Table 4 Potential significant impacts and risks	This would contribute to addressing requirements for the salinity assessment.
(c) the development and application of a solute transport model that assesses and demonstrates the likelihood and extent of salinity impacts on the Land and Water Resource; (d) a description of the solute transport model with modelling data and attributes;	Table 4 Potential significant impacts and risks	These would contribute to addressing requirements for determining the rate and direction of movement of the salt plume.
(e) a discussion about the likelihood and extent of salinity impacts on the Land and Water Resource; and	2.5.2 Table 4 Potential significant impacts and risks	This could partly address the requirement to quantify predicted changes to salinity that may result from the proposal. These TOR also require an assessment of potential significant impacts on soil, surface water and groundwater quality from earth disturbance, erosion, and the release of agricultural chemicals via infiltration or runoff.
(f) how salinity impacts will be managed to maintain groundwater quality in accordance with the water quality objectives declared under section 73 of the Act and prevent or minimise adverse effects on the potential use of any other land.	2.5.2 Table 4 Avoidance, mitigation and management	This could partly address the requirements for describing the measures for avoiding, mitigating and managing impacts on land and water quality.
CP 7 The licence holder must develop and submit for approval by the Controller, an adaptive management plan. The adaptive management plan must:	2.5.1 Table 3 Avoidance, mitigation and management Also: All other references to an adaptive management plan.	This would also address the TOR requirement for an adaptive management plan, if it is done in accordance with these TOR and the NT EPA Guidance on adaptive management (NT EPA 2018).
(a) include clear and measurable objectives that: (i) achieve (or reduce) the predicted impact on groundwater levels as determined	As above	Similarly, the NT EPA Guidance on adaptive management requires that the plan include

Condition Precedent (CP) replicated from water extraction licence WDCP10358 ²⁴	Relevant section of TOR	Relationship between information requirements
<p>under CP 5;</p> <p>(ii) maintain groundwater quality in accordance with water quality objectives declared under section 73 of the Act;</p> <p>(iii) protect 70% or more of the groundwater dependent ecosystems in each of the two major land form classes (Aeolian sandplain and alluvial plain) on the Land as determined under CP 5; and</p> <p>(iv) supports the Aboriginal cultural values identified under CP 10;</p>		<p>specific, measurable management objectives relevant to all potential significant environmental impacts and risks.</p> <p>The potential significant environmental impacts and risks to address in accordance with these TOR may be broader than the items specified at (a).</p>
(b) be prepared in consultation with the department;	nil	nil
(c) specify the monitoring parameters that will be used to demonstrate that the objectives under CP 7(a) are being met;	As above	Similarly, the NT EPA Guidance on adaptive management requires that the plan include quantitative performance indicators to assess progress towards objectives.
<p>(d) include the trigger values and limits identified under CP 10(d) for initiating adaptive management actions;</p> <p>(e) include quantitative triggers and limits which can be used to initiate adaptive management actions when:</p> <p>(i) groundwater level response to water taken under this licence deviates from the predictions mapped in CP 5;</p> <p>(ii) groundwater quality objectives are likely to be impacted; or</p> <p>(iii) impact on the health of groundwater dependent ecosystems is measured or predicted to exceed 30% of the extent of groundwater dependent ecosystems in each of the two major land form classes (Aeolian sandplain and alluvial plain) on the Land as determined under CP 5;</p>	As above	Similarly, the NT EPA Guidance on adaptive management requires that the plan include pre-determined triggers for initiating actions if performance deviates from objectives. This applies to all objectives.
(f) define management actions that are capable of being implemented in a timely way to meet environmental objectives;	As above	Similarly, the NT EPA Guidance on adaptive management requires that the plan include contingency interventions and clearly defined management measures or actions.
(g) establish who in the licence holder's organisation makes the decision to implement management actions under the plan in	nil	nil

Condition Precedent (CP) replicated from water extraction licence WDCP10358 ²⁴	Relevant section of TOR	Relationship between information requirements
response to triggers and the evidence on which such decisions must be made;		
(h) incorporate a feedback system to ensure appropriate actions are initiated when triggered and environmental objectives are always being met; and	As above	Similarly, the NT EPA Guidance on adaptive management requires that the plan includes a feedback system to ensure appropriate actions are initiated when triggered and environmental objectives are being met.
(i) include a review process to ensure management actions are updated as knowledge and technology improves.	As above	Similarly, the NT EPA Guidance on adaptive management requires that the plan include iterative development of new management actions as required.
<p>CP 8</p> <p>The licence holder must develop and submit for approval by the Controller a monitoring program to assess the impact of water taken under this licence on groundwater levels in the Water Resource, the health of groundwater dependent ecosystems mapped in CP 5 and other users of the Water Resource.</p> <p>The monitoring program must:</p>	2.5.1 Table 3 Monitoring and reporting	This could address the requirement for a robust monitoring and reporting relating to changes in the hydrological regime and other dependent environmental factors, if the matters in these TOR are also taken into account.
<p>(a) be prepared by a suitably qualified professional;</p> <p>(b) include the monitoring parameters, methodology and frequency for monitoring impacts attributable to water taken under this licence on:</p> <ul style="list-style-type: none"> (i) groundwater level; (ii) groundwater quality (including salinity); (iii) the health of groundwater dependent ecosystems.; and (iv) the Aboriginal cultural values identified under CP 10; <p>(c) include multi-level monitoring bores for defining stratification of groundwater quality parameters;</p> <p>(d) include a review process to ensure continuous improvement of the monitoring program; and</p> <p>(e) be implemented immediately following the Controller's approval.</p>	Table 3 Monitoring and reporting Table 4 Monitoring and reporting Table 5 Monitoring and reporting Table 8 Monitoring and reporting	As above
<p>CP 9</p>	2.5.1 Table 3 Environmental	This program would assist in addressing the requirement to describe the existing groundwater regime in the

Condition Precedent (CP) replicated from water extraction licence WDCP10358 ²⁴	Relevant section of TOR	Relationship between information requirements
The licence holder must develop and submit for approval by the Controller a program to assess the Water Resource on the Land. The program must:	values	potentially affected area.
<ul style="list-style-type: none"> (a) be prepared by a suitably qualified person; (b) incorporate a drilling program including both production and monitoring bores; (c) verify the stratigraphy of the subsurface of the Land; (d) identify the aquifers; (e) verify the aquifer properties; (f) determine the interconnectivity between the aquifers; (g) quantify the aquifer yields by undertaking pumping tests of at least 48 hrs constant discharge with a recovery period of 24 hrs or 95% recovery to initial groundwater levels; (h) conclude with a report on the assessment submitted to the Controller; and (i) be implemented following the Controller's approval. 	As above	As above
<p>CP 10</p> <p>The licence holder must develop and submit to the Controller a groundwater dependent Aboriginal cultural values impact assessment. The assessment must:</p>	2.5.6 Table 8	<p>This would partly address the requirements for the culture and heritage factor.</p> <p>These TOR require an assessment of broader Aboriginal cultural values across the potentially affected area. These are not restricted to groundwater dependent values.</p>
(a) be prepared by a suitably qualified professional;	Table 8 Environmental values	Similarly, these TOR require that the assessment is by a suitably qualified professional or organization.
(b) identify, map and document (as appropriate) the cultural values of Aboriginal people that will be impacted by groundwater extraction under this licence;	Table 8 Environmental values	These TOR require information on a broad range of Aboriginal cultural values in the potentially affected area, not only those that could be impacted by groundwater extraction.
(c) identify reference points to be used in modelling the impacts of groundwater extraction under this licence on the identified Aboriginal cultural values; and	Table 8 Monitoring and reporting	This could partly address the requirement for outlining proposed monitoring and reporting activities related to

Condition Precedent (CP) replicated from water extraction licence WDCP10358 ²⁴	Relevant section of TOR	Relationship between information requirements
<p>(d) specify monitoring parameters, trigger values and limits for the reference points which can be used to initiate actions under an adaptive management framework.</p>		<p>Aboriginal cultural values.</p> <p>It would be appropriate for these matters to be addressed in the adaptive management plan.</p> <p>These TOR have broader requirements for addressing the culture and heritage factor.</p>

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