Northern Territory Environment Protection Authority

TERMS OF REFERENCE FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT

GRANTS LITHIUM PROJECT

CORE EXPLORATION LIMITED

August 2018

Abbreviations and Glossary

DSO	Direct Shipping Ore
DMS	Dense Media Separation
EA Act	*Environmental Assessment Act*
EAAP	Environmental Assessment Administrative Procedures
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
ESCP	Erosion and Sediment Control Plan
ISO	International Standards Organisation
ha	Hectare
km	Kilometre
MB	Megabyte
ML	Megalitre
NT EPA	Northern Territory Environment Protection Authority
QA/QC	Quality assurance and quality control
WRD	Waste Rock Dump

1 Introduction

Core Exploration Limited (the Proponent) proposes to develop the Grants Lithium Project (the Proposal) approximately 24 km south of Darwin and 22 km west of Berry Springs.

The Proposal is to develop and operate an open-cut lithium mine targeting a pegmatite deposit containing spodumene ore. The Proposal would produce Direct Shipping Ore (DSO) and may include additional processing to produce a higher lithium concentrate.

The proposed life of mine is two to three years with operations planned as follows; pre-strip (1-7 months), operation (8-25 months), external Waste Rock Dump (WRD) rehabilitation (within 12 months) and final rehabilitation and closure (26-30 months). The Proposal encompasses 117 hectares (ha) of the 770 ha mineral lease ML31726 located on vacant crown land.

The Proposal includes the following components and activities:

- open-cut mining of the pegmatite deposit using open cut drill and blast mining methods
- clearing of 117 ha of native vegetation and extraction of 1.8 Million tonnes (Mt) of ore and 18 Mt of waste materials
- establishment of a 14 ha, 150 m deep pit; a 55 ha, 25 m high waste rock dump; and 15 ha of temporary topsoil stockpiles
- either, or both of the following non chemical processing options:
  - crushing and screening to produce DSO at an estimated peak production rate of one million tonnes per annum
  - water-based Dense Media Separation (DMS) to produce a beneficiated product of higher lithium concentration
- construction of a 5 km access track and water pipeline to Observation Hill Dam with a total footprint of 10 ha
- establishment of mine support infrastructure, processing and waste facilities
- progressive rehabilitation of the external face of the WRD during operation
- containment of Tailings Storage Facility within the WRD if DMS processing is used
- transport of DSO and/or beneficiated product to East Arm Port by road for overseas export.

The Proposal has an estimated maximum annual water requirement of 300 megalitres (ML) to produce DSO or a maximum of 470 ML per year if DMS processing is used.

The Proponent submitted a Notice of Intent for the proposal on 8 November 2017. On 3 May 2018, the Northern Territory Environment Protection Authority (NT EPA) decided the Proposal requires assessment at the level of an Environmental Impact Statement (EIS). The NT EPA's decision is supported by the Statement of Reasons available on the NT EPA's website at: https://ntepa.nt.gov.au/environmental-assessments/current-projects.

The proposal has not been referred under the *Environment Protection and Biodiversity Conservation Act 1999*.

2 Description of the proposal

2.1 General information

The draft EIS should describe the Proposal, including, but not limited to, the following information:

- the title of the Proposal
- the full name, contact details and postal address of the Proponent
- a clear outline of the objective of the Proposal
- identification of areas under exploration that may be mined in future, or any other potential future activities being planned that would be subject to a separate referral
- description and maps of the location of the Proposal in the region and its proximity to:
    - landmark features
    - sites of cultural significance
    - sites of social significance
    - regional community centres
    - areas on the National Reserve System
    - police, fire and emergency services infrastructure
    - sensitive environments, such as major waterways or coastal waters; significant groundwater resources; significant natural features and conservation reserves
- description of the regional setting of the site, including:
    - current land use, including on adjacent areas
    - detailed background of previous, current and proposed developments in the area
    - a map showing how the proposal relates to any other proposals or actions, of which the Proponent should reasonably be aware, that have been or are being taken, or that have been approved in the region
- the location of all infrastructure (both existing and proposed) relating to any aspect of the construction, operation and decommissioning/rehabilitation of the Proposal
- the background to the development of the Proposal, including discussion of previous or other environmental impact assessment
- National, State and/or Territory standards, codes of practice and guidelines relevant to the Proposal
- the consequences both positive and negative of not proceeding with the Proposal.

2.2 Environmental history

The draft EIS must include details of the environmental record of the Proponent including:

- details of any proceedings under Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Proponent and details of systems and processes that have been subsequently upgraded

- any international or national accreditations (e.g. ISO 14001), environmental awards or other recognition for environmental performance
- if the Proponent is a corporation, details of the corporation's environmental policy and planning framework.

2.3 Proposal components

The draft EIS should identify all the processes and activities intended for the Proposal and associated ancillary activities, during the life of the Proposal. To provide background to discussion of specific components, the following should be included:

- an overview of the life-of-mine schedule for the Proposal phases:
  - construction
  - operations
  - rehabilitation
  - decommissioning and closure.

2.3.1 Infrastructure overview

Identify the Proposal footprint using eastings/northings. Provide a description of the whole of proposal footprint, using detailed maps and diagrams, including:

- the location and dimensions of any works to be undertaken, structures to be built or elements of the Proposal, including but not limited to:
  - existing infrastructure
  - mine pits
  - roads (new and existing)
  - hardstands
  - stockpiles
  - waste rock dumps
  - processing plant
  - water-related infrastructure, including:
    - existing and proposed construction or modifications to water supply sources
    - storage facilities
    - pipelines and access easements
- mineral resources to be explored, developed, mined and included in mine rehabilitation and closure activities
- all areas where native vegetation will be cleared or disturbed, both temporarily and for the life-of-mine.

2.3.2 Mining construction and operation

Provide details of the following aspects of mine construction and operation:

- a schedule and procedures for clearing and preparation of the site, including handling/stockpiling/management/ disposal of vegetation and topsoil
- methods for open pit construction
- volumes, sources and characterisation of materials required to support the operation, closure and rehabilitation of the mine (e.g. fill, clays)

- plant and machinery required
- design details and dimensions or design concepts for:
  - open pits
  - waste rock dumps
  - run of mine pad
  - mine access and haul roads
  - explosives and detonator magazines
  - product and other stockpiles
  - other significant mine infrastructure.
- type (e.g. cut-off grades), storage and management of the stockpiled materials (e.g. top soil, waste rock)
- quantity of material to be mined annually, including any proposed ramping up of production or staging of development
- how target resource grades will be produced
- product handling requirements
- timetable for mining operations, including staging of progressive rehabilitation activities.

2.3.3 Ore processing

Provide relevant information with respect to processing, including but not limited to:

- transport of materials to and from the processing facility
- processing methods, including the major equipment to be used in the various ore processing unit operations
- volumes and storage of materials required, including, if applicable, any chemicals, reagents and fuel
- water requirements, sources and treatment
- storage requirements for process water
- details of the two processing options (DSO and DMS), the hazards of each option and by-products of processing at the site. In addition, the EIS should outline how the two processing options impact the following:
  - mine schedule and life-of-mine
  - potential impacts to water quality and use
  - final landform, rehabilitation and closure planning
  - potential socio-economic impacts

2.3.4 Non-mineral waste and hazardous materials

Describe the potential sources and proposed methods for storage and disposal of non-mineral waste and the management of hazardous materials, including:

- descriptions of predicted waste streams, both industrial and domestic, including solid and liquid wastes at the mine site and other relevant locations and information on any wastes likely to be disposed in landfill

- information on potentially hazardous materials to be used or produced and methods for storage, transport, handling, containment, disposal and emergency management of these materials (including fuel)
- legislation, guidelines, and standards applicable to the Proposal's landfill, sewage treatment and any other waste disposal facilities, such as the NT EPA's *Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the NT*, the Code of practice for on-site wastewater management.

2.3.5 Transport

Describe the proposed methods and routes for transporting and exporting product, including:

- product handling requirements
- storage and laydown areas
- transport and export alternatives, and justification for the proposed option.

Provide relevant information with respect to any changes to the existing road network and access track construction, including:

- the sections of road proposed to be upgraded
- methods for crossing sensitive areas, such as waterways and/or land units with poor soil recovery potential and if there will be any alteration to local water flow patterns (e.g. pipeline easement)
- methods for intersecting linear infrastructure and major roads
- source of construction inputs and materials for bulk earth works
- ongoing provisions for road and access track repairs and maintenance, including source and extraction of maintenance inputs and materials.

Details of road use associated with the Proposal should be provided, including:

- estimated frequency of Proposal-related vehicle use on public roads
- the annual or seasonal operational period
- hours of operation, including peak user times.

2.3.6 Water

Describe water requirements for the Proposal and outline the options for sources of supply. The description should be in accordance with the Northern Territory Department of Primary Industry and Resources *Template for the Preparation of a Mining Management Plan* (Section 6 – Water Management)[1], including:

- weather and climate summary and patterns, which may influence water management during operation and/or rehabilitation
- Proposal water balance and account. Predictions should include rainfall over wet, dry and average years. Water account should be based on the Minerals Council of Australia Water Accounting Framework[2]

[1] https://minerals.nt.gov.au/__data/assets/word_doc/0019/256060/AA7-030-Template-for-the-Preparation-of-a-Mining-Management-Plan.docx.

[2] http://www.minerals.org.au/file_upload/files/resources/water_accounting/WAF_UserGuide_v1.2.pdf

- water demand requirements for each aspect of the Proposal (including dust suppression, drinking water, ablutions and sewage treatment, mine water, processing of low grade ore and any other uses)
- any requirements for additional clean water in the Dry season and Wet season discharge options for excess contaminated water
- pit dewatering requirements
- management of process waters
- diversion of surface waters
- water efficiency and recycling.

2.3.7 Energy

Provide relevant information with respect to energy, including but not limited to:

- details of energy infrastructure requirements, for all components of the Proposal, including fuel storage
- consideration of alternative (renewable) sources of energy and justification of selected option
- any initiatives to improve energy efficiency
- estimates of the greenhouse gases emitted during the Proposal (scope 1 and scope 2), including from land clearing as well as construction and operation.
- details of the Proponent's reporting obligations for greenhouse gas emissions under the *National Greenhouse and Energy Reporting Act 2007*.

2.3.8 Workforce

Provide relevant information with respect to the workforce and any requirements for employee accommodation, including but not limited to:

- details of the estimated number of people to be employed, skills base required, and likely sources (local, regional, overseas) for the workforce during construction, operation and decommissioning and closure phases
- the Proponent's proposed organisation chart
- arrangements for transport of workers to and from Proposal areas, including air and road services if required.

2.4 Approvals and conditions

The draft EIS must provide information on requirements for approval or conditions that apply, or that the Proponent reasonably believes are likely to apply, to the Proposal, including, but not limited to:

- a description of any approval(s) certificate(s), permit(s) etc. that has been obtained from a State, Territory or Australian Government agency or authority including any conditions imposed
- a summary of current agreements between the Proponent and the Northern Territory Government; and/or the Australian Government; and/or other stakeholders (e.g. Traditional Owners, land occupiers, land managers)
- a statement identifying additional approvals that are required
- relevant legislation that may apply to the proposal

- a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the Proposal.

3 Impact assessment

The EIS should be undertaken with specific emphasis on the identification, analysis and mitigation of potential environmental impacts and risks through a whole-of-Proposal impact analysis and risk assessment. Through this process, the EIS should:

- Identify any potentially significant environmental impacts (direct, indirect and cumulative impacts) associated with the Proposal analyse the likelihood and consequence of predicted significant impacts to the environment
- evaluate the significance of the potential impacts and risks in a local and regional context
- identify management measures to avoid and mitigate environmental impacts and risks, and monitoring measures to demonstrate effectiveness in achieving predicted outcomes
- identify levels of uncertainty about the assessment and the effectiveness of controls in minimising/mitigating potential impacts
- identify the stakeholders that may be expected to accept the residual significant impacts of the Proposal
- demonstrate that the Proposal represents best practicable technology
- demonstrate that the Proposal is consistent with ecologically sustainable development principles contained in the Intergovernmental Agreement on the Environment[3]

A number of environmental factors that could potentially be impacted have been identified through a preliminary assessment of the Proposal. Further potential environmental impacts and risks may be identified during the course of the EIS process that were not apparent at the time these Terms of Reference were prepared. If relevant, these potential impacts and risks should be outlined and appropriate management initiatives developed to demonstrate that:

- the Proponent is fully aware of the potential environmental impacts and risks associated with all predictable aspects of the Proposal
- the prevention and mitigation of potential impacts and risks is properly addressed in the design specifications
- the potential impacts and risks can and will be managed effectively during the construction, operation, decommissioning, closure and post-closure phases of the Proposal.

Information provided should permit the general reader to understand the likelihood and consequence of each potentially significant environmental impact and risk presented by the Proposal, as well as any uncertainty about the effectiveness of proposed controls. Levels of uncertainty that preclude robust quantification of impact should be clearly acknowledged. Where adaptive management is proposed, the EIS should define clear, appropriate and measurable management objectives and outcomes, identify potential areas of uncertainty and impacts, describe appropriate monitoring programs, specify quantitative triggers for intervention and describe proposed management actions in

[3] http://www.environment.gov.au/about-us/esd/publications/intergovernmental-agreement

response to those triggers. Ongoing monitoring and feedback loops should also be described.

Sufficient quantitative analysis should be provided to indicate the Proponent's views about whether impacts are likely to be acceptable or tolerable. A comparison can be made with similar ventures in Australia and internationally. Assumptions used in the analyses should be explained.

The EIS should include appropriate consideration of the impacts on the general environment, important ecosystems and matters of national environmental significance and discuss whether those impacts are irreversible. If the impacts are reversible, include an indication of the potential timeframe expected to achieve recovery from any impacts and identify what level of restoration of habitat could be achieved to reinstate a high level of ecosystem function.

Cumulative impacts

An assessment of cumulative environmental impacts should be undertaken that considers the potential impact of the Proposal in the context of existing developments, and reasonably foreseeable future developments. The impact and risk assessment should consider and discuss cumulative impacts, where relevant, and account for impacts on an appropriate scale, recognising that:

- landscape change originates not only from single projects and management actions, but also from complex and dynamic interactions of multiple past, present and future management actions
- biophysical, social and economic change accumulates through additive or interactive (or synergistic) processes. The aggregate impact of multiple actions on the environment can be complex and may result in impacts that are more significant because of interactive processes
- any given action does not operate in isolation. The most significant changes are often not the result of the direct effects of an individual action, but from the combination of multiple minor effects over time.

4 Preliminary key environmental factors

The NT EPA has identified the following preliminary environmental factors that may be impacted by the Proposal:

1. Terrestrial Flora and Fauna
2. Terrestrial Environmental Quality
3. Inland Water Environmental Quality
4. Hydrological Processes
5. Social, Economic and Cultural Surroundings.

The EIS is to provide sufficient information regarding the potential impacts and risks arising from the Proposal and the proposed management and mitigation measures to be implemented to meet the NT EPA's environmental objectives relating to each of the factors as detailed below. A short assessment for any other relevant environmental factors should be provided where they are found to be relevant to the Proposal.

4.1 Land

4.1.1 Terrestrial flora and fauna

4.1.1.1 NT EPA objective

NT EPA's objective related to Terrestrial flora and fauna is to:

- protect the NT's flora and fauna so that biological diversity and ecological integrity are maintained.

This objective recognises the value of maintaining ecosystem services to ensure that the diversity, distribution and productivity of flora and fauna from species to ecosystem levels are maintained. The importance and value of sensitive and significant vegetation communities are also recognised here. This objective is supported by the protection of listed threatened species, migratory species and ecological communities under the *Territory Parks and Wildlife Conservation Act* through minimising impacts on these values.

4.1.1.2 Relevant policy and guidelines

Guidelines for Assessment of Impacts on Terrestrial Biodiversity[4]

Significant Impact Guidelines 1.1 – Matters of National Environmental Significance[5]

4.1.1.3 Assessment of impacts

The draft EIS should describe, quantify and map, where relevant:

- The area of habitat and the results of targeted surveys for *Stylidium ensatum.* The surveys should be undertaken at an appropriate time of year by a suitably qualified person that has demonstrated experience in surveying for and the identification of threatened species in the Northern Territory. If targeted surveys find *S. ensatum,* potential impacts should be evaluated using the Significant Impact Guidelines[5]
- A comprehensive assessment of the regional status of *Typhonium praetermissum.* The assessment should include the known number of individual plants and patches. The assessment should consider the potential habitat (in ha) and the percentage of habitat that would be impacted by the proposal. The assessment should use the most recent habitat modelling for the species and the NT Flora and Fauna Atlas (via NR Maps[6])
- The location of threatened flora species and significant and sensitive vegetation with respect to waterways, indicative surface water flow directions and location of all proposed infrastructure, including the alignment of the pipeline easement, alternative water sources and diversion bunds including at post closure
- The presence, or likely occurrence, of introduced and invasive species (both flora and fauna) within and adjacent to the Proposal area, and regionally, including weed species declared under the *Weeds Management Act*.

[4] https://ntepa.nt.gov.au/__data/assets/pdf_file/0004/287428/guideline_assessment_terrestrial_biodiversity.pdf

[5] http://www.environment.gov.au/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance

[6] http://nrmaps.nt.gov.au

4.1.1.4 Mitigation and management

The draft EIS should include an Environmental Management Plan (EMP) which outlines the measures for minimising and managing the potential impacts and risks to terrestrial flora and fauna including native vegetation that is to be maintained onsite. The EMP should include the following:

- Vegetation Clearing Management Procedure
- Weed Management Plan, including:
  - weed hygiene protocols and measures to prevent the introduction and spread of weeds during mining activities
  - measures for maintaining weed free stockpiles throughout the life of the Proposal
  - rehabilitation and weed control of the site, access routes and surrounding bushland for a minimum of two years post mining.

In the event that threatened species are identified during targeted surveys, the Proponent shall prepare a Threatened Species Management Plan as part of the EMP. The Threatened Species Management Plan should contain clear and concise methods outlining how the Proponent intends to mitigate the potential impacts and risks to threatened species. All mitigation and monitoring measures should be substantiated and in accordance with best practice advice from relevant Northern Territory advisory agencies.

Where suitable habitat for threatened species occurs on/adjacent to mining related infrastructure, the Proponent should demonstrate in the draft EIS that it has considered all feasible alternatives with the aim or avoiding/reducing impacts to those areas including exclusion of clearing from areas of suitable habitat.

4.1.1.5 Monitoring and reporting

Provide detailed program(s) to monitor the potential impacts identified from the proposed actions. The draft EIS should:

- identify the methods for monitoring the impacts to biodiversity values
- identify effective control sites and clear thresholds to inform remedial action and ensure early identification of potential negative impact
- provide sufficient detail in monitoring programs to assess their effectiveness to inform management plans for all stages of the development.

4.1.1.6 Statement of residual impact

The draft EIS should provide a statement of residual impact detailing the extent to which mitigation and management measures will address potential impacts to ensure that the objective of this environmental factor is met or highly likely to be met.

4.1.2 Terrestrial environmental quality

4.1.2.1 NT EPA objective

NT EPA's objective related to terrestrial environmental quality is to:

- maintain the quality of land and soils so that environmental values are maintained.

The objective recognises the essential link between soil quality and protection of the ecological and social values that soil quality supports.

4.1.2.2 Relevant policy and guidelines

- Department of Mines and Petroleum, Western Australia Guidelines for Preparing Mine Closure Plans, 2015
- International Council for Mining and Metals Planning for Integrated Mine Closure: Toolkit.

4.1.2.3 Assessment of impacts

The draft EIS should describe, quantify and map, where relevant, the existing

- soil types and land unit(s)
- properties of the soils and substrate types/land units within the proposal footprint.

4.1.2.4 Mitigation and management

To mitigate and manage the potential impacts and risks to the environmental values related to land and soils, the draft EIS should include a draft Mine Closure Plan. Given the short duration of the proposal, it is the NT EPA's expectation that through the EIA process the draft Mine Closure Plan will be finalised. The draft Mine Closure Plan should identify all closure objectives (including those associated with stakeholder expectations) and outline how those objectives would be achieved. The draft Mine Closure Plan should include a description of:

- proposed closure objectives, standards and criteria and future land tenure and land-use arrangements
- proposed approach for securing a safe, stable and non-polluting mine-site
- proposed staging and timing of rehabilitation and closure
- removal of plant, equipment, infrastructure and water storages, and methods proposed for stabilisation of affected areas
- proposed methods for topsoil management and soil profile reconstruction, with demonstration of their effectiveness for rehabilitating disturbed areas
- proposed revegetation objectives, criteria and strategies, including seed collection and storage and any research and investigations that may be required
- measures to stabilise soils to erosion levels similar to comparable landforms in surrounding undisturbed areas
- contingencies to make landforms and mine components secure and non-polluting in the long term
- proposed funding and management arrangements for closure (both planned and unexpected), including responsibilities for post-closure management.

While it is the NT EPA's preference that open pits or voids are progressively backfilled and rehabilitated, it recognises that a final decision on a closure option needs to be informed by an adequate and transparent evaluation of the benefits, risks and costs of all options. The draft Mine Closure Plan should therefore evaluate all closure and rehabilitation options for the site including progressive backfilling of the pit.

The draft Mine Closure Plan should identify risks to the successful rehabilitation and closure of the Proposal, including:

- closure timeframes and objectives
- risks that the Proposal may create an ongoing environmental, social and/or economic legacy if operations are required to cease ahead of schedule due to unforeseen circumstances, prior to the planned closure and rehabilitation of the site
- the post-closure risk assessment should include a discussion of the effects of:
  - changes in the assumptions used as a basis for the post-closure risk assessment
  - natural events, including earthquakes, rainfall events, fire and flood.

The draft Mine Closure Plan should identify the factors that could influence unanticipated or early closure or care and maintenance of the mine and the impacts to rehabilitation objectives.

Given the short term life of mine, the following should be provided in the draft Mine Closure Plan:

- agreed closure objectives and agreed post mining land use
- qualitative development of completion criteria
- detailed closure-based risk assessment and mitigation measures
- well advanced closure and monitoring plans
- commitment to addressing knowledge gaps relating to informing closure specific information
- details of closure objectives with regard to final dimensions of landforms and topography for disturbed areas and availability, quantity and quality of materials (including cover material) required for closure.

4.1.2.5 Statement of residual impact

The draft EIS should provide a statement of residual impact detailing the extent to which mitigation and management measures will address potential impacts to ensure that the objective of this environmental factor is met.

4.2 Water

4.2.1 Inland water environmental quality

4.2.1.1 NT EPA objective

NT EPA's objective related to Inland water environmental quality is to:

- maintain the quality of groundwater and surface water so that environmental values including ecological health, land uses, and the welfare and amenity of people are protected.

This objective recognises the integral link between water quality and the environmental values supported by good water quality. Water quality can be impacted by direct discharge of waste and diffuse sources of pollution (both natural and artificial) associated with land uses.

4.2.1.2 Relevant policy and guidelines

- NT EPA's Environmental Assessment Guideline on Acid and Metalliferous Drainage
- GARD Guide – Best practices and technology to address AMD issues (INAP, 2009)[7]
- Preventing Acid and Metalliferous Drainage – Leading Practice Sustainable Development Program
- Department of Mines and Petroleum, Western Australia Guidelines for Preparing Mine Closure Plans, 2015
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality
- Darwin Harbour Water Quality Protection Plan
- Water Quality Objectives for the Darwin Harbour Region
- Water Management Plan – Chapter 6 of the Mining Management Plan Structure Guide for Mining Operations - Department of Primary Industry and Resources (2017)
- Water stewardship framework - International Council on Metal and Minerals (2014)

4.2.1.3 Assessment of impacts

The draft EIS should provide, quantify and map, where relevant:

- the rivers/drainage lines that would be receiving surface runoff and groundwater from the Proposal area
- declared beneficial use areas of receiving waters downstream of the Proposal
- the results of baseline water quality (major cations and anions, metals, metalloids, acidity/alkalinity, etc.) of receiving waters (surface and groundwater)
- predicted long term water quality levels of the final mine pit lake
- existing users of surface and/or groundwater resources.

4.2.1.4 Mitigation and monitoring

To manage the potential impacts to surface and groundwater quality in receiving waters the draft EIS should include a Water Management Plan. The Water Management Plan should include, but not be limited to, the following information:

- prediction of expected long term water quality and management of the final pit lake
- strategies for avoiding and/or managing possible discharges of contamination, pollutants and toxicants into receiving waters
- strategies and controls for avoiding and/or managing the risks associated with the transportation and spills of hazardous materials
- provide a Water Quality Monitoring Program which includes the following:
    - baseline water quality and site specific trigger values for all relevant analytes

[7] http://www.gardguide.com/index.php?title=Main_Page

- the timing of sampling as well as the methods and parameters for the collection of surface and groundwater quality information
- contingency measures that would be implemented in the event that the identified water quality triggers are exceeded during mining activities and until the site is rehabilitated.

All mitigation measures in the Water Management Plan should be adequately detailed to demonstrate best practicable management to ensure that the environmental values of receiving waters are maintained. The Water Management Plan is to be peer reviewed by an independent, third party. The NT EPA expects the peer reviewer to be recognised by industry as a senior practitioner and be independent from the Proponent/principal consultant and the proposal. The reviewer should demonstrate independence by acting objectively, disclose interests as appropriate and be free from conflicts of interest that may arise in relation to the engagement.

The Water Management Plan should link closely with an Erosion and Sediment Control Plan (ESCP). The ESCP should be prepared by a Certified Practitioner in Erosion and Sediment Control. The ESCP should clearly identify areas that are vulnerable to erosion, receiving waters and outline the measures that would be implemented to manage the movement of sediment across the site.

The draft EIS should include a waste rock characterisation program that includes the results of investigations to identify the presence of sulfides and other potential contaminants in material to be mined. The investigation should characterise individual lithologies and the level of homogeneity for each. Mined volumes of each lithology should be identified and characterisations should include analysis for chemical concentration of naturally occurring radioactive material and potentially acid-forming material. Spatial distribution and density should be designed to define waste and not limited to sampling from locations intended for ore definition. The waste rock characterisation program should be undertaken to the satisfaction of the Department of Primary Industry and Resources.

The draft EIS should include details of how the Proponent intends to avoid, manage and treat waste rock that is identified during investigations as being non-benign.

The draft Mine Closure Plan required in section 4.1.2.4 should outline a plan for mine closure that takes into account the results of materials characterisation, data on the local environmental and climatic conditions, and consideration of potential impacts through contaminant pathways and environmental receptors. The Plan should:

- describe post-mining management, monitoring and reporting for potential impacts and risks to downstream water quality following mine closure including evaluation of rehabilitation success and progress toward achieving closure objectives
- provide detail on the impacts and risks of the final mine pit lake with focus on appropriate water sampling, monitoring programs, risk avoidance measures and mitigation actions, in consideration of Appendix H of the Western Australia Guidelines for Preparing Mine Closure Plans (Interim guidance on pit lake assessment through a risk-based approach)
- include contingency measures to be implemented in the event that monitoring demonstrates that rehabilitation closure objectives are not being met

While it is the NT EPA's preference that open pits or voids are progressively backfilled and rehabilitated, it recognises that a final decision on a closure option needs to be informed by an adequate and transparent evaluation of the benefits, risks and costs of all options. The draft Mine Closure Plan should provide details on the potential impacts of those alternative rehabilitation and closure options with respect to contaminant pathways and environmental receptors.

4.2.1.5 Statement of residual impact

The draft EIS should provide a statement of residual impact detailing the extent to which mitigation and management measures will address potential impacts to ensure that the objectives of this environmental factor are met.

4.2.2 Hydrological processes

4.2.2.1 NT EPA objective

NT EPA's objective related to Hydrological processes is to:

- maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.

This objective recognises the fundamental link between hydrological regimes and the environmental values they support. Values include water dependent ecosystems, amenity, cultural values, recreational, public drinking water and agricultural and industrial use of water. The emphasis of this factor and associated objective is on how any modification to hydrological regimes may significantly impact these values supported by both ground and surface waters.

4.2.2.2 Relevant policy and guidelines

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality
- Darwin Harbour Water Quality Protection Plan
- Water Quality Objectives for the Darwin Harbour Region.

4.2.2.3 Assessment of impacts

The draft EIS should describe, quantify and map, where relevant:

- the surface water hydrology of the site, including:
  - major and minor rivers and drainage lines (permanent and ephemeral)
  - surface water flow directions and rates
  - water reservoirs (natural and artificial)
  - wetlands
  - beneficial uses
- groundwater aquifers and hydrogeological properties, including:
  - groundwater flows and volumes considering seasonal variation (of mine site and surrounding area of influence)
  - surface connections via springs or recharge zones
  - local and regional aquifers
  - depth to water tables, including temporal variation.
- water demand requirements of the Proposal (a water balance and account)
- proposed and existing water supply source(s), volumes and sustainability
- proposed changes to surface and groundwater flows
- estimated dimensions of stabilised water depth and pit edge of the mine pit lake
- predicted hydrological classification of the mine pit lake in accordance with the WA closure guidelines (Appendix H)

- potential impacts to other water users including local communities, groundwater dependent ecosystems, waterways and the environment.

4.2.2.4 Mitigation and management

To manage the potential impacts to the local surface and groundwater hydrology the Water Management Plan should outline how impacts to surface and groundwater hydrology would be managed for all mine-life stages and seasons including post mining, according to its source, quality, volume, end use or other parameters, including (but not limited to):

- measures to quantify, record and report volumes of water extracted from surface and groundwater
- options to safeguard surface and groundwater resources and their environmental values, including options for minimising water use
- measures for ensuring the protection and resilience of water dependent ecosystems, including wetlands downstream of the mine.

The draft EIS should include a sampling program for baseline surface hydrology. The sampling program should include a commitment to undertake further hydrological modelling for any proposed new water supply sources or modifications to existing water supply sources and a risk assessment of the flood diversion bund design for closure.

The draft Mine Closure Plan that is required in section 4.1.2.4 should include a final site-plan. The site plan should identify the final landform post rehabilitation and closure of the site. The site-plan should identify the final structures that are designed to divert, capture, retain and/or treat surface runoff from the site.

4.2.2.5 Monitoring and reporting

Provide a detailed program(s) to monitor the potential impacts identified from the Proposal. The draft EIS should:

- identify the methods for monitoring the impacts to hydrological regimes
- identify effective control sites and clear thresholds/triggers to ensure early identification of potential negative impacts and subsequent management /remedial action
- provide sufficient detail in monitoring programs to assess their effectiveness to inform management plans for all stages.

4.2.2.6 Statement of residual impact

The draft EIS should provide a statement of residual impact detailing the extent to which mitigation and management measures will address potential impacts to ensure that the objective of this environmental factor is met.

4.3 People and communities

4.3.1 Social, economic and cultural surroundings

4.3.1.1 NT EPA objective

NT EPA's objective related to social, economic and cultural surroundings is to:

- protect the rich social, economic, cultural and heritage values of the Northern Territory.

This objective recognises the importance of ensuring that social, economic and cultural values are considered in line with the principles of ecologically sustainable development.

4.3.1.2 Relevant policy and guidelines

Guidelines for the Preparation of an Economic and Social Impact Assessment[8]

4.3.1.3 Assessment of impacts

The draft EIS should include a balanced summary of the social and economic value and potential impacts (positive and negative) of the Proposal on a regional, state and national scale. The following are suggestions that may assist with identifying and assessing the social and economic value/impacts of the Proposal:

- current population, demography and key stakeholders
- a summary of the economic feasibility of the Proposal
- estimated capital and annual operational expenditure and estimated total revenue for the duration of the Proposal (to provide the economic scale of the Proposal)
- estimated overall tax and estimated total contribution to Gross Territory Product and Gross Domestic Product over the economic life of the Proposal
- opportunities available to regional centres based on the activity generated by the Proposal (construction, operation and rehabilitation)
- estimated workforce and contractor numbers by occupational classification and overall employment training proposed during construction, operation and rehabilitation
- planned Aboriginal employment, training, participation and other potential benefits
- availability of goods and services and other contributions to local communities.

The information provided in the draft EIS should not be limited to the social impacts identified in the Terms of Reference. Where additional social impacts are identified, through operations and closure, these should be assessed and mitigated as they become apparent.

4.3.1.4 Mitigation and management

The EMP should describe measures to avoid or mitigate potential impacts and risks to social, economic and cultural values identified through the SIA and should include:

- strategies for engaging with local Aboriginal communities to facilitate employment on the Proposal. This should include the delivery of training, the identification of suitable roles, and a discussion of how cultural values will be accommodated
- measures for mitigating/managing and monitoring any potential negative economic and social impacts on the locality and region
- provide outcome and assessment criteria that will give early warning in the event that management and mitigation measures are not achieving the outcomes and benefits identified and expected by the Proponent
- provide a stakeholder communications strategy including identification of, and ongoing consultation and negotiations with, all relevant stakeholders, ensuring the full range of community viewpoints are sought and included in the draft EIS

[8] https://ntepa.nt.gov.au/__data/assets/pdf_file/0006/287430/guideline_assessment_economic_social_impact.pdf

- procedures that would be implemented in the event that surface or sub-surface items of heritage and/or cultural significance are identified.

When preparing the EMP, the Proponent should consult with local communities and relevant stakeholders that may be affected by the Proposal. The outcome of these consultations should be included in the draft EIS.

The draft EIS should outline plans for rehabilitation and closure that ensures risks to social parameters, including Aboriginal stakeholders will be as low as is reasonably achievable. This should include mechanisms for evaluating rehabilitation success and progress toward achieving closure objectives associated with community expectations and agreements.

The draft Mine Closure Plan required in section 4.1.2.4 should demonstrate that ecologically sustainable mine closure can be achieved, consistent with proposed post-mining outcomes and agreed stakeholder land uses, without unacceptable liability to the Territory, and how this will be monitored in the long term. The draft Mine Closure Plan should outline the final landform including measures for managing unauthorised access by people post rehabilitation.

To manage the risks and potential impacts from construction traffic, the draft EIS should include a Traffic Impact Assessment which is prepared in accordance with the *Guide to Traffic Management Part 12: Traffic Impacts of Development* (AUSTROADS)[9]. The Traffic Impact Assessment is required to assess the impact of mining related traffic on existing road users and sensitive receptors. The draft EIS should include measures to avoid/manage the risks and potential impacts to existing road users and sensitive receptors.

4.3.1.5 Statement of residual impact

The draft EIS should provide a statement of residual impact detailing the extent to which mitigation and management measures will address potential impacts to ensure that the objective of this environmental factor is met.

5 Environmental management

The specific safeguards and controls proposed to be employed to minimise or mitigate potential impacts and risks identified in the impact assessment process are to be included in an EMP. The EMP should be strategic, describing a framework for continuing management, mitigation and monitoring programs for the significant potential environmental impacts and risks of the Proposal.

The scope, content and structure of the EMP will be a function of the outcomes of the environmental impact assessment and determined by the significance of the potential environmental impacts and risks. The EMP should not be prepared in isolation but should be consistent and integrated with the principles of an environmental management system. The EMP should include specialised management plans where it is necessary to provide a high level of operational detail. As much detail as is practicable should be provided to enable adequate assessment of the proposed environmental management policies, practices and procedures.

The EMP needs to address the Proposal phases (e.g. construction, operation and decommissioning/rehabilitation) separately. It must state the environmental objectives, performance criteria, monitoring, reporting, corrective action, necessary resourcing, responsibility and timing for addressing each environmental matter.

[9] https://www.onlinepublications.austroads.com.au/items/AGTM12-16

Further information on the development of an EMP is available in the NT EPA's *Guidelines for the Preparation of an Environmental Management Plan*[10].

6 General advice on the EIS

6.1 General content

The EIS should be a stand-alone document. It should contain sufficient information to avoid the need to search out previous or additional, unattached reports.

The EIS should enable interested stakeholders and the NT EPA to understand the environmental consequences of the Proposal. Information provided in the EIS should be objective, clear, succinct and easy to understand for the general reader. Spatially-referenced maps (using an appropriate scale, resolution and clarity), plans, diagrams and other descriptive detail should be included. Technical jargon should be avoided or accompanied by a clear explanation so that it is readily understandable. Cross-referencing should be used to avoid unnecessary duplication of text.

The EIS should describe and compare any feasible alternatives to carrying out the Proposal including, if relevant, the alternative of taking no action. The choice of the preferred option(s) should be clearly explained and justified, including how it complies with the principles of ecologically sustainable development. Sufficient details should be provided to justify the preferred Proposal scope and components.

The level of analysis and detail in the EIS should reflect the level of significance of the potential impacts and risks on the environment, as determined through adequate technical studies. Consideration of appropriate spatial, temporal and analytical scales should be used to clearly communicate the potential impacts and risks to the environment. Reliability of the data and an explanation of the sampling criteria and approach should be provided where data are used to support statements, studies and claims in the EIS.

Information materials summarising and highlighting the potential impacts and risks of the Proposal should be provided in a culturally appropriate format and language, accompanied by graphics and illustrations that assist with interpretation, where relevant.

It is an offence under the *Northern Territory Environment Protection Authority Act* to give information to the NT EPA that the person knows is misleading or contains misleading information.

6.2 Information requirements

The NT EPA has prepared Guidelines to assist in the preparation of EIS documents. The Guidelines are developed and updated periodically, and should be referenced and referred to when addressing the information requirements in an appropriate section of EIS.

6.3 Structure, format and style

The EIS should comprise of three elements:

1. Executive summary

The executive summary must include a brief outline of the Proposal and each chapter of the EIS, allowing the reader to obtain a clear understanding of the proposed action, its environmental implications and management objectives. It must be written as a

[10] https://ntepa.nt.gov.au/__data/assets/pdf_file/0006/284883/guideline_prep_emp.pdf

standalone document, able to be reproduced on request by interested parties who may not wish to read the EIS as a whole.

2. Main text of the document

The main text of the EIS should include a list of abbreviations, a glossary to define technical terms, acronyms, abbreviations, and colloquialisms. The document should consist of a series of chapters detailing the level of significance and management of the expected and potential impacts and risks on the environment from the proposed action.

3. Appendices

The appendices must include detailed technical information, studies or investigations necessary to support the main text. These will be made publicly available and should include at a minimum:

- a table listing how these Terms of Reference have been addressed in the EIS, cross-referenced to chapters, page numbers and/or appendices
- the name of, work done by and the qualifications and experience of the persons involved in preparing the EIS
- a table listing commitments made by the Proponent
- detailed technical information, studies or investigations necessary to support the main text.

The EIS should be produced on A4 size paper capable of being photocopied, with any maps, diagrams or plans on A4 or A3 size paper, and in colour, if possible.

6.4 Referencing and information sources

All sources must be appropriately referenced using the Harvard Standard. The reference list should include the address of any internet pages used as data sources. All referenced supporting documentation and data, or documents cited in the EIS must be available upon request. For information given in the EIS, the EIS must state:

- the source of the information
- how recent the information is
- how the reliability of the information was tested
- what uncertainties (if any) are in the information.

All variables used or assumptions made in the EIS must be clearly stated and discussed. Confidence levels must be specific, as well as the sources from which they were obtained. The extent to which a limitation, if any, of available information may influence the conclusions of the environmental assessment should be discussed. The results of quality control and quality assurance (QA/QC) testing are to be provided where data are used to support statements or findings in the EIS. Sufficient discussion should accompany the data to demonstrate that the QA/QC and data are suitable and fit for purpose. The EIS must include information on any consultation about the Proposal, including:

- any consultation that has already taken place
- a list of persons and agencies consulted during the EIS
- if there has been consultation about the Proposal, any documented response to, or result of, the consultation
- proposed consultation about relevant impacts of the Proposal

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

The EIS has an important role in informing the public about this Proposal. It is essential that the Proponent demonstrates how any public concerns were identified and will influence the design and delivery of the Proposal. Public involvement and the role of government organisations should be clearly identified. The outcomes of any surveys, public meetings and liaison with interested groups should be discussed including any changes made to the proposal as a result of consultation. Details of any ongoing liaison should also be discussed.

6.5 Administration

The Proponent should lodge three bound hardcopies and an electronic (Adobe PDF format) copy of the EIS with the NT EPA. The electronic copies should be provided both as a single file of the entire document and separate files of the document components. A Microsoft Word copy of the EIS should be provided to facilitate the production of the Assessment Report.

The Proponent should consider the file size, format and style of the document appropriate for publication on the NT EPA website. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.

The Proponent is to advertise that the draft EIS is available for review and comment in the Northern Territory News. The NT EPA requires the complete EIS document and a draft of the advertisement at least one week prior to advertising the draft EIS, to arrange web upload of the document and review and comment on advertising text. Each file needs to be no larger than 35 MB in size.

If it is necessary to make use of material that is considered to be of a confidential nature, the Proponent should consult with the NT EPA on the preferred presentation of that material, before submitting it to the NT EPA for consideration.

Spatial data should be provided to the NT EPA as importable Geographic Information System shape files, with relevant features and areas geospatially referenced and marked as polygons, lines and points.

The Proponent will be required to attend a meeting with staff of the Department of Environment and Natural Resources (Environment Division) prior to lodgement of the draft EIS. The purpose of the meeting will be to provide an update on the administrative requirements for review of the draft EIS, including file sizes, transmission of electronic files, numbers of hard copies to be printed and to identify the start and end date of public exhibition.

6.6 Public exhibition

The NT EPA proposes a minimum six week public exhibition period for the draft EIS and will confirm the duration of the period in writing after the pre-lodgement meeting. The public exhibition period may be varied at that time in consideration of the complexity of the draft EIS and to allow adequate opportunity for the community and Government to access the draft EIS (for example, a longer exhibition period may be required if submission occurs in late December or January in any year).

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

- NT EPA, Level 1, Arnhemica House, 16 Parap Road, Parap
- Department of Primary Industry and Resources, 3rd Floor, Paspalis Centrepoint, 48 Smith Street Mall, Darwin

- Northern Territory Library, Parliament House, Darwin
- Environment Centre Northern Territory, Unit 3, 98 Woods St, Darwin.