

**TERMS OF REFERENCE FOR THE PREPARATION OF
AN ENVIRONMENTAL IMPACT STATEMENT**

**JERVOIS BASE METAL PROJECT
KGL RESOURCES**

May 2014
Version 1.0

1	Introduction.....	1
2	General Advice on the Environmental Impact Statement	2
2.1	General Content.....	2
2.2	Structure, Format and Style.....	2
2.3	Referencing and Information Sources	3
2.4	Administration	4
2.5	Public Exhibition.....	4
3	Description of the Proposed Action	5
3.1	General Information.....	5
3.2	Approvals and Conditions.....	6
3.3	Project Components.....	6
3.4	Alternatives	11
4	Risk Assessment	12
4.1	Risk Assessment Approach.....	12
4.2	Information Requirements	13
4.3	Cumulative Impacts.....	13
4.4	Water	13
4.5	Biodiversity.....	16
4.6	Human Health and Safety	19
4.7	Socio-economic.....	20
4.8	Historic and Cultural Heritage.....	22
4.9	Rehabilitation and Closure	24
4.10	Other Risks	26
5	Environmental Management	27

1 Introduction

The Proponent, KGL Resources, proposes to commence open pit and underground mining and ore processing at the Jervois Base Metal Project (the Project), located approximately 270km east-north-east of Alice Springs, NT. The Project tenements have been the subject of historic exploration and mining by various operators since 1929. The current proposal is to mine copper, and other base metals, from four new and existing open pits and three new underground mines. Ore would be processed onsite using standard flotation methods to produce copper sulphide concentrate. The concentrate would be transported in truck containers to the Alice Spring rail terminal via a haul road and the Plenty and Stuart Highways. Concentrate would be subsequently transported by rail to Darwin for export.

The Project infrastructure would include workshops, laydown areas, an explosive magazine, offices, warehouses, a laboratory, haul roads, sewage treatment systems, 12MW diesel and/or gas fired power station, powerlines, water storages, an airstrip and accommodation camp. It is estimated that the workforce would peak at approximately 110 staff during full production of the underground and open cut operations, and would operate on a fly-in fly-out basis.

The Proponent predicts that the Project would have a mine life of approximately 7 years. This estimate is based on an extraction rate of approximately 2Mt of ore per annum.

The Notice of Intent for the Project was referred from the Department of Mines and Energy to the Northern Territory Environment Protection Authority (NT EPA) on 25 November 2013 for consideration under the *Environmental Assessment Act* (EA Act). On 25 February 2014, the NT EPA decided that the Project required assessment under the EA Act at the level of an Environmental Impact Statement (EIS).

The NT EPA decision was based on the following potential environmental risks and potential impacts:

- Potential impacts on biodiversity from land clearing and mining activities proposed for the Project. Risks and mitigation measures have yet to be adequately addressed, especially in relation to the identification and protection of threatened species yet to be surveyed by the Proponent, and in the control of declared weeds;
- Risk to the value status and condition of the Jervois Range Site of Bioregional Significance from the proposed development;
- Risks to the quality of and accessibility/availability to shared regional surface and groundwater resources from the development, operation and closure of the Project;
- Uncertainties with regards to the extraction and processing of the ore and associated management of water, tailings and waste streams, including potentially acid forming material. Any disturbance to or contribution of materials to the existing mine components has the potential to impact on the geotechnical and geochemical integrity of the existing mine features;
- Increased risk of soil erosion and dust generation from the Project. Soils of the Jervois Ranges are highly sensitive to disturbance and have poor recovery potential once disturbed;
- Increased demand and/or impact on existing services and infrastructure, including road, railway and air transport networks;
- Potential for disturbance to heritage places and objects; and

- Potential social, cultural and economic impacts, including the risks of the Project not realising its projected economic and social benefits.

On 27 February 2014, a delegate for the Australian Government Minister for the Environment decided that the Project (EPBC 2014/7111) was not a controlled action and did not require assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

These Terms of Reference have been developed to assist the Proponent in preparing an EIS for the Project, in accordance with Clause 8 of the Environmental Assessment Administrative Procedures.

2 General Advice on the Environmental Impact Statement

2.1 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 Project. Information provided in the EIS should be objective, clear, succinct and easily understood by the general reader. 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 level of analysis and detail in the EIS should reflect the level of significance of the potential impacts 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 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. All known and unknown variables, limitations or assumptions made in the EIS must be clearly stated and discussed.

Information materials summarising and highlighting risks of the Project 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.

2.2 Structure, Format and Style

The EIS should comprise of three elements:

1. Executive summary

The executive summary must include a brief outline of the Project 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 stand-alone 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 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:

- 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; and
- 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.

2.3 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; and
- What uncertainties (if any) are in the information.

All known and unknown variables 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 Project, 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 Project, any documented response to, or result of, the consultation;
- Proposed consultation about relevant impacts of the Project; and
- 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 Project. It is essential that the Proponent demonstrates how any public concerns were identified and will influence the design and delivery of the Project. 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.

2.4 Administration

The Proponent should lodge ten 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 NT News; and
- The Centralian Advocate.

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.

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.

2.5 Public Exhibition

Sufficient copies of the EIS should be provided to and be made available for public exhibition at:

- NT EPA, 2nd Floor, Darwin Plaza, 41 Smith Street Mall, Darwin;
- Department of Lands, Planning and the Environment, Floor 1, Alice Plaza Building, Todd Street Mall, Alice Springs;
- Mines and Energy Information Centre, Department of Mines and Energy, 3rd Floor, Paspalis Centrepoin, 48 Smith Street Mall, Darwin;
- Northern Territory Library, Parliament House, Darwin;
- Alice Springs Public Library, Gregory Terrace, Alice Springs;
- Central Land Council, 27 Stuart Hwy, Alice Springs;
- Arid Lands Environment Centre, 18 Warburton St, Alice Springs; and
- Environment Centre Northern Territory, Unit 3, 98 Woods St, Darwin.

The public exhibition period for the draft EIS will be six (6) weeks. The EIS exhibition period should not occur in late December or January in any year to ensure optimal opportunity for public and Government viewing of the EIS document. Additional time will be added to the EIS exhibition period if the EIS exhibition overlaps any Christmas and January periods.

3 Description of the Proposed Action

3.1 General Information

Provide the background and context of the Project, including:

- The title of the Project;
- The full name and postal address of the Proponent;
- The location of the Project 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; and
 - sensitive environments, such as major waterways, significant groundwater resources, significant natural features and conservation reserves.
- Climate and atmospheric characteristics relevant to the Project, e.g. air quality, seasonal temperatures, humidity, wind, evaporation, extreme events and rainfall;
- The background to the development of the Project, including discussion of previous environmental impact assessment and overview of historic mining activities;
- An explanation and outline of the objectives, benefits and justification for the Project;
- Identification of areas under exploration that may be mined in future, or any other potential future activities being planned;
- How the Project 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;
- Details of the Proponent's environmental record, including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Proponent, and details of systems and processes that have been subsequently upgraded;
- National, State and/or Territory standards, codes of practice and guidelines relevant to the Project; and
- The consequences, both positive and negative, of not proceeding with the Project.

3.2 Approvals and Conditions

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

- A description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority;
- A summary of current agreements between the Proponent and the Northern Territory Government, and/or the Australian Government, and/or other stakeholders, including Traditional Owners and/or land managers;
- A statement identifying additional approvals that are required; and
- A description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the Project.

When identifying the individual approval(s), certificates, permits etc. the Proponent must include details of the approval(s), certificates, permits etc., including any conditions imposed. Consideration should be given, but limited to, the following legislations:

- *Environment Protection and Biodiversity Conservation Act 1999;*
- *Territory Parks and Wildlife Conservation Act;*
- *Water Act;*
- *Waste Management and Pollution Control Act;*
- *Mining Management Act;* and
- *Public and Environmental Health Act & Regulations.*

3.3 Project Components

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

- The current status of the Project;
- An overview of the life-of-mine schedule for the Project phases:
 - construction;
 - operations;
 - rehabilitation; and
 - decommissioning and closure.
- An outline of the geology of the area, including:
 - major geological units and properties of the Project area; and
 - the extent and characterisation of:
 - the mineral resource;
 - orebody; and
 - waste rock.

- Delineation of the Project footprint using detailed maps and diagrams, including:
 - locations of existing infrastructure and mine components;
 - locations of existing water extraction points and storage facilities;
 - location of the mineral resources to be explored, developed, mined and included in mine rehabilitation and closure activities;
 - all areas to be cleared or disturbed, both temporarily and for the life-of-mine; and
 - the location of any works to be undertaken, structures to be built or elements of the Project, including but not limited to:
 - the open pit and underground mines;
 - roads;
 - airfield;
 - accommodation village and construction camps;
 - hard stands;
 - stockpiles;
 - pipeline corridors;
 - rail siding;
 - product export or transshipment facilities; and
 - water-related infrastructure, including:
 - water extraction points; and
 - storage facilities.

3.3.1 Mine

Provide specific details of the following aspects of mine construction:

- Methods for open pit and underground mine construction;
- Methods for portal and decline construction to access the proposed underground mining areas, if required;
- Volumes of materials required to support the construction of the mine, including, but not limited to, consumables, such as bulk chemicals and fuel; and
- Plant and machinery required.

Provide specific details of the following aspects of mine operation:

- Mining types and methods, including the major equipment to be used in the various components of the operation;
- Type (e.g. cut-off grades), storage and management of the stockpiled materials (e.g. top soil, waste rock etc.);
- Quantity of material to be mined annually, including any proposed ramping up of production or staging of development; and

- Design details, dimensions and design concepts for the:
 - open pits;
 - underground mines;
 - waste rock dump(s);
 - tailings storage facility;
 - run of mine pad;
 - mine access and haul roads;
 - explosives and detonator magazines;
 - product and other stockpiles; and
 - other significant mine infrastructure.

The specifications should include details of the location, layout (with and without capping), factor of safety rating, expected design life, permeability and liner and capping design, where relevant.

3.3.2 Processing

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

- Transport of materials to the processing circuit;
- Processing methods, including the major equipment to be used in the various components of the processing operation;
- Volumes of materials required, including, but not limited to, consumables such as bulk chemicals and fuel; and
- Water requirements, treatment and sources.

3.3.3 Waste Management

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

- Descriptions of predicted waste streams, both industrial and domestic, including solid and liquid wastes at the mine site, accommodation facilities and other relevant locations;
- 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);
- The proposed size and construction details for landfill, and a list of wastes likely to be deposited in landfill;
- Legislation, guidelines, and standards applicable to the Project's landfill, sewage treatment and waste disposal facility; and
- An inventory of any waste streams requiring management during the Project.

A brief discuss of proposed waste management strategies, including reduction, reuse, recycling, storage, transport and disposal of waste should be included in a relevant section of the EIS.

3.3.4 Tailings Management

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

- Methods for managing tailings and associated process water, including volumes; and
- The anticipated quantity of tailings that would be produced and managed from the Project.

3.3.5 Transport

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

- Maximum width of road corridors required for construction and operation;
- Plant and machinery required;
- Vegetation clearing methods and disposal of plant matter following clearing;
- Timeframes for access track and haul road construction and upgrade;
- Methods for crossing sensitive areas, such as waterways and/or land units with poor soil recovery potential;
- Methods for intersecting linear infrastructure and major roads;
- Source of construction inputs and materials for bulk earth works; and
- Ongoing provisions for road and access track maintenance, including source and extraction of maintenance inputs and materials.

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

- Type, size and number of vehicles required during all phases of the Project;
- Quantities of materials to be transported to the mine (e.g. heavy machinery, equipment, diesel, hazardous materials, such as sulfuric acid);
- Estimated frequency of Project-related vehicle use on public roads; and
- Hours of operation, including peak user times.

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

- Product handling requirements;
- Storage and laydown areas;
- Road, rail and port networks to be utilised by the Project; and
- A discussion of the facilities purposes and capability (e.g. East Arm Wharf, Alice Springs Rail Terminal, etc.) to meet the transporting and exporting requirements of the Project.

Describe the intended use and capacity of the airfield to service the Project. Detail any upgrades, area of disturbance and commitments to meet aviation legislative obligations (e.g. Civil Aviation Safety Authority).

3.3.6 Water

Provide information on the quantity, quality, source (groundwater and/or surface water), storage, and infrastructure requirements for water use, including a water balance, for both construction and operation phases of the Project, considering:

- Dust suppression;
- Drinking water;
- Ablutions and sewage treatment;
- Mine water;
- Waterway diversion works;
- Processing circuit; and
- Any other uses.

Anticipated extraction rates, usage and volumes of water should be provided, where relevant.

3.3.7 Energy

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

- Information on the Project's energy requirements, including mining fleet fuels and electricity demand for mine operations and the accommodation facilities;
- Details of energy infrastructure requirements, for all components of the Project, including fuel storage; and
- Describe any initiatives proposed to improve energy efficiency and/or reduce emissions to air.

3.3.8 Noise

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

- The expected noise levels associated with the Project construction and operation, including timing and duration;
- Location of nearest sensitive receptors; and
- Nominated noise criteria and standards.

3.3.9 Air

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

- A description of the sources and projected quantities of greenhouse gases and particulates (i.e. dust) emitted by the Project;
- Reporting requirements and compliance with relevant health and/or environmental standards;
- Air quality target thresholds with reference to regulatory industry-standard, health-related safe-limits, or aspirational parameter levels; and
- An inventory of any emissions to air resulting from the Project.

3.3.10 Workforce and Accommodation

Provide relevant information with respect to the workforce and 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 operational and decommissioning and closure phases;
- The number of people that may be employed to manage or undertake environmental duties on the site, including the specific qualifications and the level of experience with mining or other related activities;
- Discuss arrangements for transport of workers to and from project areas, including air services required;
- Layout of the construction camp and accommodation village with respect to the work sites and mining and processing operations; and
- Requirements for licensing, food preparation and storage.

3.3.11 Ancillary Infrastructure

Provide construction and operational information regarding ancillary infrastructure, including, but not limited to:

- Telecommunications;
- Airstrip; and
- Any existing ancillary infrastructure that could be utilised by the Project.

3.4 Alternatives

The EIS should describe any feasible alternatives to carrying out the Project. The choice of the preferred option(s) should be clearly explained, including how it complies with the principles and objectives of ecologically sustainable development.

Alternatives should include:

- Not proceeding with the Project;
- Site selection for mine and processing components;
- Mining and processing methods;
- Management of wastes;
- Water management;
- Rehabilitation methods;
- Methods of product treatment, storage, transport and export;
- Energy sources for power generation, including renewable energy sources;
- Alternative lifecycle; and
- Consideration of alternative environmental management measures for key risks.

Discussion should include:

- Sufficient detail to make clear why a particular alternative is preferred to another;

- Adverse and beneficial effects (direct and indirect) of alternatives at national, Territory, regional and local levels and their distributional impact; and
- The comparison of short (whilst operational), medium (post closure) and relevant long term advantages and disadvantages of the options.

4 Risk Assessment

4.1 Risk Assessment Approach

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

- Identify and discuss the full range of risks presented by the Project, including those of special concern to the public;
- Identify relevant impacts;
- Quantify and rank risks so that the reasons for proposed management responses are clear;
- Identify levels of any uncertainty about estimates of risk and the effectiveness of risk controls in mitigating risk;
- Explicitly identify those members of the community expected to accept residual risks and their consequences, providing better understanding of equity issues; and
- Demonstrate that the Project represents best practicable technology.

A number of key risks have been identified through a preliminary assessment of the Project. Each of the identified risks should be addressed by the Proponent in the risk assessment and management process. It is expected that further risks will be identified through the comprehensive risk assessment process required for the EIS. These should be addressed and appropriate management initiatives developed to demonstrate that:

- The Proponent is fully aware of risks associated with all predictable aspects of the Project;
- The prevention and mitigation of risks are properly addressed in the design specifications; and
- The risks can and will be managed effectively during the construction, operation, decommissioning, closure and post-closure phase of the Project.

Information provided should permit the reader to understand the likelihood and potential severity of each risk presented by the Project, and any uncertainty around these risks, as well as any uncertainty about the effectiveness of controls. Levels of uncertainty that preclude robust quantification of risk should be clearly acknowledged.

Risk rankings assigned should be fully justified. Where a risk score associated with the likelihood or consequence of an impact is reduced as a result of proposed mitigation measures, clear justification should be provided for the reduction in score. The adequacy and feasibility of mitigation measures must be demonstrable.

Sufficient quantitative analysis should be provided to indicate whether risks 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.

4.2 Information Requirements

The NT EPA has prepared a series of Environmental Assessment Guidelines to assist in the preparation of EIS documents. Environmental Assessment Guidelines are developed and updated periodically, and should be referenced and referred to when addressing the information requirements in an appropriate section of EIS. Environmental Assessment Guidelines, current at the time of publication of these Terms of Reference, include:

- *Environmental Assessment Guidelines on Acid and Metalliferous Drainage;*
- *Guidelines for Assessment of Impacts on Terrestrial Biodiversity;*
- *Guidelines for the Preparation of an Economic and Social Impact Assessment;* and
- *Guidelines on Environmental Offsets and Associated Approval.*

4.3 Cumulative Impacts

Cumulative impacts can arise from compounding activities of a single operation or multiple mining and processing operations, as well as the aggregation and interaction of mining impacts with other past, current and future activities that may not be related to mining.

An assessment of cumulative environmental impacts should be undertaken that considers the potential impact of the Project in the context of existing developments, and reasonably foreseeable future developments, to ensure that any potential environmental impacts are not considered in isolation. The extent of cumulative impacts to be considered depends on the nature of the environmental issue. The risk assessment should consider and discuss cumulative assessment, where relevant, and account for impacts on an appropriate scale, such 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; and
- 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 the accumulation of time.

4.4 Water

4.4.1 Key Risks

The EIS should consider risks to surface and groundwater, and potential impacts on regional hydrology and dependent ecosystems from the Project. The EIS should include a detailed assessment of the risks to demonstrate that the Proponent is aware of and has provided appropriate mitigation for the following environmental objectives:

- Available water supplies will be sufficient to fulfil the Project needs over the predicted life-of-mine, without causing environmental or social impacts; and
- Water resources are protected both now and in the future, such that ecological health and land uses, and the health, welfare and amenity of people are maintained.

4.4.2 Information Requirements

- Details relating to existing water resource conditions and monitoring should be provided, including discussion and data relating to:
 - local and regional aquifer properties;
 - connectivity between groundwater and surface water;
 - results from baseline water quality and hydrology monitoring programs, where available and relevant; and
 - changes to surface and groundwater systems (hydrology, quality and quantity) as a result of previous mining and mining-related activities.
- Provide a detailed description of site and regional surface water catchments, waterways, springs, wetlands and regional groundwater resources;
- Describe the environmental values of the surface waterways and groundwater potentially affected;
- Describe water quality and flows, and existing water users potentially impacted by the Project;
- Discuss how the Project will impact on the current water management practices, such as for pastoral uses;
- Details of proposed groundwater extraction, including treatment, storage, reuse and disposal options and impacts to the overall mine water balance;
- Type, size and location of water treatment facilities;
- Describe the geochemical characterisation of mined rock and tailings to allow an assessment of the likely quality and quantity of potential seepage water (e.g. testworks to identify potentially acid forming materials); and
- Describe site and, if relevant, regional hydrogeology to enable the prediction of potential impacts of the Project on water resources and their features adjacent to mining areas, including drawdown cones and pollution pathways.

4.4.3 Assessment of Risks

The EIS should include an assessment of risks to surface and/or groundwater resources at an appropriate spatial scale as a result of the Project. In particular, the EIS should identify and assess the risks:

- To existing surface and groundwater quality and quantity as a result of the Project, with specific reference to components identified in Section 3.3.6;
- Of potential uncontrolled release or passive discharge of contaminants, such as metalliferous drainage and hydrocarbons, to surface and/or groundwater resources as a result of the Project components identified in Section 3.3;
- Of potential impacts to adjacent areas and vegetation, including surface waterways, from the drawdown of groundwater, including the volume of groundwater expected to be intercepted and/or extracted during the Project;
- Of potential impacts to surface and/or groundwater quality from the unsuccessful rehabilitation of tailings, waste rock or other rehabilitation and containment works;
- Associated with the new infrastructure or disturbance of soils altering the hydrology and rates of erosion and sedimentation of waterways;

- Of groundwater inflow to underground mining works is of a large quantity and/or poor quality;
- Associated with slope or erosion stability;
- Of impact of major weather events (e.g. 5 to 100 year average recurrence interval [ARI]) and extreme weather events (e.g. 100 year ARI, or greater) on water management and infrastructure, including contingency management; and
- Of any additional impacts to surface and/or groundwater resulting from changes to the Project.

The influence of seasonality should be discussed, where relevant. The risk assessment should give consideration to the short (whilst operational), medium (post closure and under institutional control) and long term (post-institutional control) timeframes of the Project.

A conceptual site model describing potential sources, pathways, receptors, and fate of any potentially contaminated waters from the Project, and Project components (Section 3.3), is to be provided in the EIS. The model should be of sufficient detail for the general reader to understand the source(s) of potential contaminants, the mechanism(s) of their release, the pathway(s) for transport, and the potential for human and ecological exposure to these potential contaminants.

The minimum data required to support the model should include, but should not be limited to:

- Laboratory (e.g. static and/or kinetic tests) and field testing (at appropriate survey effort) to characterise the acid generation, acid neutralisation and metal leaching potential of mine products and infrastructure (e.g. faces, ore, waste, etc.);
- Material volume and mass of potential contaminant sources;
- Hydrogeological characterisation (e.g. groundwater occurrence, direction and rate of flow, etc.);
- Hydrologic characterisation (e.g. surface water flow, seasonality etc.);
- Baseline water quality (i.e., major cations and anions, metals, metalloids, acidity/alkalinity, etc.) of receiving waters;
- Biological receptors and their habitats; and
- Other complementary technical studies, at an appropriate temporal and spatial scale, used to develop the model, such as:
 - geology;
 - hydrology;
 - hydrogeology;
 - geochemistry;
 - biology;
 - meteorology; and
 - engineering/geotechnical.

An appropriately qualified and experienced person should be involved with the supervision and interpretation of test results and the development of the model.

Appropriate statistical design details including the number of samples, sampling site selection procedures and QA/QC protocols to support the development of the model should be provided and justified.

4.4.4 Mitigation

The EIS should contain a draft Water Management Plan (WMP) that outlines clear and concise measures to mitigate likely impacts of the Project on water resources. All mitigation and monitoring measures in the WMP should be adequately detailed to demonstrate best practice management and that environmental values of receiving waters will be maintained. The WMP must include but not be limited to measures that:

- Avoid contamination of surface or groundwater resources;
- Ensure the protection and resilience of water dependent ecosystems;
- Protect water quality and levels for existing users of bores and/or surface waterways;
- Avoid the exposure of livestock to salt or other toxicants which may be harmful; and
- Treat and manage domestic wastewater and sewage.

The WMP should be closely related to but separate from an Erosion and Sediment Control Plan (ESCP) for the Project. Measures to be addressed in both the WMP and the ESCP should include options for minimising water use, management and treatment of clean and contaminated water, including site stormwater, erosion and sediment control measures, and appropriate management of any potentially acid forming material excavated or exposed through mining. It is essential that appropriate consideration of potential contaminant sources and the management is provided, such that the environment is protected from pollution in short (whilst operational), medium (post closure and under institutional control) or long term (post-institutional control).

4.4.5 Monitoring

The WMP and ESCP should outline details of monitoring programs that will be implemented throughout the life of the Project to determine the effectiveness of the mitigation measures. The monitoring programs should identify clear thresholds and contingency measures should operational activities affect water resources.

A summary of the surface and groundwater quantity and quality reporting requirements and monitoring programs used to evaluate and report on the effectiveness of the mitigation measures (Section 4.4.4) should consider:

- Methods to monitor the impacts of the Project on surface and groundwater quality; and
- Monitoring for leaks or spills of materials from pipelines, storage facilities (including tailings storage facilities) and transport operations to ensure protection of local soils, aquifers, environments, workers and the general public.

Provisions to notify and respond to environmental and human health risks associated with water quality, or other water related emergency, should be discussed and provided in the draft EIS.

4.5 Biodiversity

4.5.1 Key Risks

The Project is of a size and scale that biodiversity values, conservation status, diversity, geographic distribution or productivity of local native flora or fauna species or

ecosystems may be degraded by Project actions. The Project may result in one or more of the following significant impacts to species or communities listed as threatened under the EPBC Act and/or *Territory Parks and Wildlife Conservation Act*:

- Long-term decrease in the size of an important population of a listed threatened species or community;
- Adverse effects on habitat critical to the survival of a species or community;
- Fragmentation of an existing important population into two or more populations;
- Reduced area of occupancy of an important population or community; and/or
- Modification, destruction, removal or isolation of the availability or quality of habitat, to the extent that a threatened species or community is likely to decline.

4.5.2 Information Requirements

- Details of vegetation community types occurring on and adjacent to the Project location;
- Details of soils and topography on and adjacent to the Project area;
- Details of the area and location of any land to be cleared as a result of the proposal, including, but not limited to, descriptions of:
 - all vegetation communities to be cleared of native vegetation; and
 - drainage lines, waterways, and sensitive or significant vegetation communities that have the potential to be impacted by the Project.
- Details of listed threatened species and communities that are likely to be present in the vicinity of the site, including detail of the scope, timing (survey season/s) and methodology for studies or surveys used to provide information on the listed threatened species and their habitat at the site (and in areas that may be impacted by the proposal);
- Details of the significance, presence and extent of *Eremophila cordatisepela*; and
- Description of the presence, or likely occurrence, of introduced and invasive species (both flora and fauna) in the region.

Vegetation community and habitat mapping should be undertaken across the Project footprint. The mapping should be of a standard that sufficiently identifies any areas that have already been subject to clearing activities or disturbance previously (if any) and to identify areas of vegetation that are proposed to be cleared. Mapping should include identification of any significant or sensitive vegetation types, at a scale appropriate to the assessment of risk to their biodiversity values.

The EIS should include the results of targeted surveys for listed threatened species and communities undertaken on the site. The EIS should include details of the survey methodology, sampling effort and qualifications of the survey team.

4.5.3 Assessment of Risk

Provide a detailed risk assessment outlining the risks to biodiversity values as a result of the Project. The EIS should include references to relevant research and relevant statutory plans, such as action plans, recovery plans and threat abatement plans, when assessing the risks.

- Identification of all situations where construction and/or operation activities could potentially interact with listed threatened species and/or communities. Where a

risk has been identified, the EIS should include a discussion of the severity of those risks to individuals and regional populations;

- Analysis of the presence and potential impacts upon threatened fauna including consideration, where relevant, of vegetation clearance, habitat fragmentation, altered hydrology, water quality impacts, erosion and sedimentation impacting on creeks and wetlands, soil compaction, inappropriate/ineffective rehabilitation, groundwater contamination, impacts on surface and groundwater systems, waste material, risks associated with the transport or storage of hazardous chemicals, weed and pest invasion, noise and dust impacts;
- Analysis of any likely impact that the proposal may facilitate on listed threatened species at the local, regional, state, and national scale;
- Analysis of the potential impact of the Project to vegetation at a local and regional scale, including the potential for ongoing indirect impacts as a result of edge effects, weed incursion or other processes exacerbated through construction or operation of the Project; and
- Analysis of the potential risks associated with the accidental introduction or spread of weed species onto or throughout the site and offsite. The discussion should consider relevant weeds of national significance and those listed under the *Weed Management Act*.

4.5.4 Mitigation

The EIS should contain a detailed Biodiversity Management Plan that outlines clear and concise methods to mitigate likely impacts to biodiversity. All mitigation and monitoring measures should be in accordance with best practice advice from relevant Northern Territory and Australian Government advisory agencies and focus on:

- Potential significant impacts to biodiversity as a whole;
- Weed control measures and hygiene protocols as required under the *Weed Management Act*;
- Potential significant impacts to vegetation types, short-range endemic, rare or threatened flora or fauna; and
- Sites of conservation significance, including the Jervois Ranges.

The EIS must provide information on proposed safeguards and mitigation measures to deal with the relevant potential impacts of the action on listed threatened species. Detail preventative, management and treatment strategies used to minimise the impacts of the Project on native flora and fauna including, but not limited to, the risks identified above.

Specific and detailed descriptions of proposed measures must be provided and substantiated, based on best available practices for each threatened species that may be impacted by the proposal and must include the following elements:

- A description of proposed safeguards and mitigation measures to deal with relevant potential impacts of the action, including mitigation measures that are currently or to be taken by the Territory government or the proponent;
- Assessment of the expected or predicted effectiveness of the mitigation measures; and
- Any statutory or policy basis for the mitigation measures.

Proposed mitigation measures must be incorporated in the Environmental Management Plan (EMP) (see Section 5).

4.5.5 Monitoring

The Biodiversity Management Plan should include details of a Fauna and Flora Monitoring Program which is designed to monitor the effectiveness of the mitigation measures proposed. The Flora and Fauna Monitoring Program should identify the methodology for monitoring the impacts to biodiversity and identify clear thresholds and contingency measures which will be implemented in the event that the mitigation measures appear ineffective. Detail reporting and monitoring programs of flora and fauna that will be used to evaluate and report on the effectiveness of the mitigation measures (Section 4.5.4).

4.6 Human Health and Safety

4.6.1 Key Risks

The EIS should include an assessment of the risks to human health and safety associated with the construction, operation and decommissioning and closure of the various components of the Project, and the storage and transport of materials to and from the mine site. Service requirements, disruptions to services, potential risks to the safety of transport network users and the capacity of current infrastructure to meet the demands of the Project are currently unknown risks.

4.6.2 Information Requirements

- Identify all hazards, including physical hazards, noise, emissions and radiation, as a consequence of the Project; and
- Identify workers and any members of the general public, including their location and patterns of activity and occupation, with the potential for exposure to these hazards as a consequence of the Project.

4.6.3 Assessment of Risks

Aspects to be discussed include:

- Health and safety risks for the workforce and the general public for the duration of the Project including post-closure;
- Safety risks associated with the fire, including combustible materials and bushfire;
- Potential risks relating to the environment and public safety from the transportation of concentrate, explosives (bulk emulsion) and consumables, including dangerous goods, on public roads; and
- General health and safety risks associated with the Project including, but not limited to:
 - open pit or underground mine collapse; and
 - hazardous materials exposure.

4.6.4 Mitigation and Monitoring

Detail preventative, management, treatment and monitoring strategies used to minimise the impacts of the Project on human health and safety. Outline environmental (including health and safety) management strategies necessary for human health and safety, and describe how these strategies will be incorporated into the EMP (Section 5).

The hazard and risk analysis will identify critical areas that need to be addressed in management plans, monitoring programs, and contingency and emergency plans and should include:

- Mitigation measures to address safety risks identified in Section 4.6.3;
- Measures to prevent third party interference with the project;
- Safeguards for minimising the likelihood of bushfire, and fire response plans;
- Safeguards, management and monitoring strategies to be implemented to minimise potential aircraft impacts, including:
 - measures to reduce extraneous noise and lighting, considering:
 - proximity of the airfield to communities and pastoral stations;
 - confusion for pilots; and
 - visibility from increased brightness or glare.
 - measures to reduce dust related issues, with specific reference to transport-, aviation- and communication-related dusts.
- Safeguards, management and monitoring strategies to be implemented to minimise potential transport impacts:
 - safety measures to be used to reduce transport risks (e.g. safety awareness measures);
 - methods for complying with any relevant road vehicle axle limits;
 - methods for securing loads;
 - consultation with local communities affected by transport impacts;
 - traffic management;
 - measures to reduce any road traffic nuisance impacts (e.g. noise, dust, light); and
 - management of driver fatigue.

4.7 Socio-economic

4.7.1 Key Risks

The Project has the potential to cause positive and/or negative impacts on the regional, Territory and national economies, and the social well-being of the population. Operations and activities associated with the life of the Project have the potential to change social demographic, cultural and economic elements. As a result potential economic and social benefits may not be optimised and costs may not be fully understood and taken into consideration.

4.7.2 Information Requirements

The EIS should include a balanced summary of the Project's economic value (positive and negative) to the regional, Territory and national economies, in terms of direct and indirect effects on employment, income and production. The following are suggestions that may assist with highlighting the economic value of the Project and are not intended to result in the inappropriate disclosure of confidential information. It should be noted in the EIS if data are not available or unsuitable.

- A summary of the Project's economic feasibility;
- Details of the financial capacity to implement the Project, the significance of potential risks to project implementation and associated proposed mitigation

measures, including the capacity to cost for mine closure and care and maintenance activities;

- Estimated total project revenue for the duration of the Project (to provide the economic scale of the Project);
- Total contribution to Gross State Product and Gross Domestic Product over the economic life of the Project;
- Opportunities available to regional centres based on the activity generated by the Project (construction, rehabilitation and operation);
- Estimated overall tax;
- Estimated capital and annual operational expenditure;
- Estimated workforce and contractor numbers by occupational classification;
- Overall employment training proposed during commencement, construction and operations;
- Planned Indigenous employment, training and other project participation;
- Expected level of overseas recruitment;
- Availability of goods and services;
- Estimates of the quantity and value of production/exports relating to the Project, including expected reduction in revenue should the Project not proceed;
- Community and economic value of any residual infrastructure, such as roads, following the life of the Project; and
- Other contributions to local communities, including traditional owners.

The EIS should include a balanced summary of the Project's social value (positive and negative) on a regional, Territory, national and international scale. A brief description of the current population, demography and social aspects of the region affected by the Project should be provided in the EIS. This should be done through community consultation, historic research and field survey. No information of a confidential nature, particularly related to anthropological matters relevant to Indigenous people or groups is to be disclosed in the EIS. The EIS should include information on:

- Key stakeholders;
- Regional community structures and vitality (e.g. demography, health, education and social well-being, access to services, housing);
- Social amenity; and
- The number and capacity of existing human services to support the Project:
 - skills audit of affected communities;
 - workforce characteristics; and
 - accommodation type and quantity.

4.7.3 Assessment of Risks

An Economic and Social Impact Assessment (ESIA) should be conducted. The ESIA should:

- Document the economic and social impacts of the Project on the region and more broadly, where relevant;
- Encourage development of new and/or expansion of existing businesses in the locality;
- Foster sustainable development and community wellbeing; and
- Discuss the risks of the Project, related infrastructure and associated workforce negatively impacting on identified economic and social issues in the region.

4.7.4 Mitigation and Monitoring

An Economic and Social Impact Management Plan (ESIMP) should be prepared to address any risks identified in the ESIA. The ESIMP should:

- Describe how the Proponent proposes to manage any identified economic, social, cultural or tourism risks from the Project, or its associated workforce;
- Describe how potential local and regional business and employment opportunities related to the Project will be identified and managed;
- Include a mechanism for monitoring and reporting any identified potential socio-economic and cultural impacts;
- Include measures to mitigate negative economic and social impacts on the locality and region;
- Provide outcome and assessment criteria that will give early warning that management and mitigation measures are not achieving the outcomes and benefits expected and identified by the Proponent; and
- 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 EIS.

4.8 Historic and Cultural Heritage

4.8.1 Key Risks

The EIS should consider the risk of damage to or degradation of sites or items which have historic or cultural heritage values caused by Project activities.

4.8.2 Information Requirements

The EIS should outline the cultural and heritage significance of any sites located during archaeological investigations on or near the Project area or that could be impacted by the Project activities. The EIS should include the results of searches on the Northern Territory Government database and identify any sites or places protected or nominated for protection under the following legislations:

- *Aboriginal and Torres Strait Island Heritage Protection Act 1984;*
- *Environment Protection and Biodiversity Conservation Act 1999.*
- *Heritage Act,* and
- *Northern Territory Aboriginal Sacred Sites Act.*

Baseline information should be provided regarding historic or cultural heritage in the region, including:

- A description and location of Indigenous and non-Indigenous sites, places or objects of historic or cultural heritage significance;
- Survey(s) used to identify sites, places or objects of historic or cultural heritage significance (e.g. archaeology);
- Areas nominated for listing or listed on Commonwealth and Northern Territory Heritage registers and Commonwealth and Northern Territory registers of Indigenous cultural heritage; and
- Provision of evidence of an Aboriginal Areas Protection Authority (AAPA) Authority Certificate under the *Northern Territory Aboriginal Sacred Sites Act*.

The EIS should provide a summary outlining the survey effort and level of confidence that all items of heritage or cultural significance at risk have been identified. The EIS should provide information on the current status of any approvals, permits or clearances in relation to the protection of heritage items or places.

The EIS must outline consultations with Indigenous stakeholders and traditional owners for all areas potentially affected by the Project. Determination and details should be provided of current traditional owner utilisation of Project areas, and spiritual/cultural significance of potentially affected areas.

4.8.3 Assessment of Risks

- An assessment of the Project's potential impacts on sacred sites, heritage places, cultural sites and any potential impacts on Indigenous culture generally;
- Details of the Project's requirements to apply to, or applications already made to, the NT Minister for Lands, Planning and the Environment to disturb or destroy a prescribed archaeological place and/or object under the *Heritage Act*; and
- An assessment of risk to significant cultural sites from vibration and dust.

Advice and permits on the conduct of heritage surveys should be sought from the responsible authorities. Independent qualified professionals, in consultation with the traditional owners, or their representative bodies in the relevant area, must conduct surveys. Research and surveys are to be carried out using an appropriate methodology which provides for involvement of Indigenous people and which is acceptable to the traditional owners concerned with the relevant areas. Relevant Indigenous groups should be consulted in relation to the nature and scope of surveys and the appointment of the people to undertake them. Consultation with historical organisations should also be undertaken.

4.8.4 Mitigation

The Proponent should describe the prevention and mitigation of potential risks to existing sites or items of historic and cultural heritage in a Heritage Management Plan (HMP). The HMP should include:

- Procedures to avoid significant sites;
- Protection of key sites during construction, operation and decommissioning work;
- Measures to enable the Proponent, or contractor to the Proponent, to meet its duty of care to protect the cultural and heritage values of any places or items of significance; and
- Procedures for the discovery of surface or sub-surface items during the course of the Project.

4.8.5 Monitoring

The HMP should include details of a monitoring and reporting program to determine the effectiveness of mitigation measures (Section 4.8.4). The monitoring and reporting program should identify when further action is required and outline contingency measures should the proposed mitigation measures result in degradation to the values of items with heritage or cultural significance.

4.9 Rehabilitation and Closure

4.9.1 Key Risks

The EIS should consider all potential environmental impacts associated with the rehabilitation, decommissioning and closure of the Project. The risk assessment should demonstrate that rehabilitation achieves a stable and functioning landform, which is consistent with the surrounding landscape and other environmental values. The prevention and mitigation of risks associated with closure and rehabilitation of the open pit and underground mines and the potential impact on the environment and/or associated communities are required to be adequately addressed.

Risk that the Project will 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.

4.9.2 Information Requirements

Discuss the various aspects of proposed progressive and final rehabilitation of disturbed areas and decommissioning and closure associated with the Project, including:

- Proposed staging and timing;
- Removal of plant, equipment, structures, hardstand and concrete footings, buildings, water storages, and methods proposed for stabilisation of affected areas;
- Reinstatement of surface waterways, where diversion of waterways are proposed during operations;
- Final landform design, including the design approach and methodology used, and any voids or landscape depressions to be left at cessation of mining;
- Closure criteria and future land tenure arrangements;
- Describe proposed post-mining land uses which have been identified and agreed upon through consultation with stakeholders;
- Availability, sources and volumes of materials required for rehabilitation, revegetation and mine closure (e.g. clay, capping materials);
- Proposed revegetation program, with selection and collection of local native species e.g. native grasses and other vegetation;
- Methods to decommission and close water bores;
- Protocols for the safe and stable securing of the underground mines, declines and portals;
- Other preparations required for rehabilitation (e.g. seed harvesting, seedling generation); and
- Provide the results of investigation into the physical, geo-mechanical and chemical properties of the ore body and host rock with respect to rehabilitation outcomes;

4.9.3 Assessment of Risks

Closure planning should be risk-based taking into account results of materials characterisation, data on the local environmental and climatic conditions, and consideration of potential impacts through contaminant pathways and environmental receptors. Identify risks to the successful closure of the Project, including risks to prescribed closure timeframes, including:

- The method for and location of the placement tailings and waste rocks areas;
- Closure timeframes and objectives and the Project not realising its projected outcomes (i.e. delays, unexpected or forced closure, etc.);
- Identification and management of potentially acid forming materials and alkaline materials; and
- The post-closure risk assessment should include a discussion of the effects of:
 - changes in the assumptions used as a basis for the assessment; and
 - natural events, including earthquakes, rain depressions, fire and flood.

4.9.4 Mitigation

A draft Mine Closure Plan (MCP), specific to the Project, should be prepared to address identified risks associated with rehabilitation, decommissioning and closure. The MCP must provide an outline of the issues that require management at closure and demonstrate that all relevant issues and appropriate management measures have been identified. The MCP should demonstrate that ecologically sustainable mine closure can be achieved consistent with agreed post-mining outcomes and land uses, and without unacceptable liability to the State.

The MCP should include:

- Mitigation measures to address risks identified in Section 4.9.3;
- Measures required to prevent contamination of surface and groundwater resources, including cross contamination of aquifers, if required;
- Measures to ensure that placement of tailings and waste rock will be physically isolated from the environment and that any contaminants arising from the tailings and waste rock will not result in any short (whilst operational), medium (post closure and under institutional control) or long term (post-institutional control) detrimental environmental impacts;
- Contingencies to make landforms secure and non-polluting in the event of unexpected or temporary closure;
- Measures to minimise the long term introduction and control of weeds;
- Revegetation strategies for disturbed sites to utilise local native plant species similar in type, density and abundance to those existing in adjacent areas; and
- Measures to ensure the stabilisation of erosion, to a level similar to comparable landforms in surrounding undisturbed areas.

The EIS should also include details of a Care and Maintenance Plan, which should include measures which outline how the Proponent will maintain its environmental obligations should the Project be temporarily closed or suspended.

4.9.5 Monitoring

- Describe the post-mining monitoring and reporting to be used to evaluate and report on the effectiveness and performance of the mitigation measures (Section 4.9.4);
- Describe the contingency measures to be implemented in the event that monitoring demonstrates that management measures have not been effective; and

Provide outcome and assessment criteria that will give early warning that management and mitigation measures are not achieving the outcomes and benefits expected and identified by the Proponent.

4.10 Other Risks

Other environmental risks should be identified and management strategies proposed, including, but not limited to:

4.10.1 Bushfires

The Proponent should be aware of sections of the *Bushfires Act* and Regulations that apply to the Project and address risk and management of bushfires in relation to Sections 4.4 and 4.5. The development of the Fire Management Plan should be in consultation with traditional owners, pastoralists and their representative organisations, including the Central Land Council, that have specialist knowledge in fire management.

4.10.2 Noise and Vibration

The potential sensitivity of receptors to noise and vibration and mitigation measures should be discussed in a relevant section of the EIS. The Proponent should address the impact of noise and vibration resulting from the project on residents and the community in a relevant section of the EIS. A Noise Management Plan should outline methods for communicating with, and reducing the impact on, residents within the vicinity of the Project who may be affected by the project.

Risk assessment for the Project should occur with respect to noise and vibrations from Project components. Potential sensitive receptors, expected impacts and proposed management should be identified with regard to Project-generated noise and vibrations.

A Noise Management and Monitoring Plan should outline proposed management to mitigate identified risks from the Project with regard to noise and vibration emissions. Cross reference should be made with a Project Public Consultation Plan facilitating communication with, and reducing the impact on, residents and communities who may be affected by the Project.

4.10.3 Air

The potential nuisance and human health issues associated with air quality, including dust, and mitigation measures should be discussed in Section 4.4 and 4.5. Consideration should be given to the acute and chronic exposure and pathways, such as inhalation, ingestion and dermal contact. The potential sensitivity of receptors to air quality, including dust, and mitigation measures should be discussed in relevant sections of the EIS. The Proponent should also assess the impacts of the Project on air, more broadly, including:

- Possible impacts of the following air quality issues resulting from the Project:
 - ambient air quality (in particular the PM10 fraction);
 - dust;
 - odour;

- gaseous emissions including carbon monoxide and oxides of nitrogen; and
- accidental and planned gas releases.
- Dust suppression strategies and monitoring of dust impacts; and
- Meteorological information applicable to air quality in the project area.

Risks to air quality may arise from emissions of chemicals, particulates or biological materials from:

- Drilling, blasting and materials handling;
- Crushing and processing;
- Chemical and mechanical processing;
- General site movements over unsealed surfaces; and
- Wind erosion mobilising dust from exposed surfaces, such as from waste dumps, laydown areas, stockpiles, and sites of vegetation clearing.

A discussion of existing variability in air quality target parameters, such as the impact of seasonal smoke haze, should be included in a relevant section of the EIS. Details of the proposed air monitoring, including technique, location, frequency and details of laboratory undertaking analysis, and target parameters, and proposed reactive management that are tied to monitoring thresholds, should be provided.

4.10.4 Visual Amenity

The extent and significance of the changed landscape on visual amenity during all stages of the Project should be discussed in a relevant section of the EIS. Aspects of the project that would be visible from key vantage points, publicly accessible areas and areas of significance, should be discussed.

4.10.5 Mosquito Breeding

Despite the Project being in an arid area, there is potential for mine sites to create mosquito breeding sites. The Proponent should be aware of sections of the *Public and Environmental Health Act* that apply to the Project and address risk and management of biting insects in a relevant section of the EIS. In particular, the EIS should identify:

- Measures to ensure water pond (i.e. sediment pond) is designed with minimal mosquito breeding potential (i.e. steep sides, deep open water); and
- Information on appropriate personal protection measures that could be utilised by workers during periods of elevated mosquito abundance.

5 Environmental Management

Specific safeguards and controls proposed to be employed to minimise or remedy environmental impacts identified in previous sections are to be included in an EMP, which would become part of the Mining Management Plan.

The EMP should be strategic, describing a framework for continuing management, mitigation and monitoring programs for the relevant impacts of the Project, including any provisions for independent environmental auditing of the Project. As much detail as is practicable should be provided to enable adequate assessment of the proposed environmental management practices and procedures.

The EMP needs to address the Project phases (construction, operation, decommissioning, closure and post-closure) separately. It must state the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue.

The EMP should include:

- The proposed management structure of the operation and its relationship to the environmental management of the site;
- Management targets and objectives for relevant environmental factors;
- The proposed measures to minimise adverse impacts and maximise opportunities, including environmental protection outcomes;
- Performance indicators by which all anticipated and potential impacts can be measured;
- Proposed monitoring programs to allow early detection of adverse impacts;
- Proposed reporting procedures consistent with Territory and Australian Government legislative requirements;
- Contingencies for emergency events, such as hydrocarbon and other hazardous chemical spills or natural disasters;
- The name of the agency responsible for endorsing, approving and/or overseeing each mitigation measure or monitoring program;
- A summary table listing the commitments made in the EIS, including clear timelines for key commitments and performance indicators, with cross-references to the text of the EIS; and
- Provision for the periodic review of the EMP.

The EMP would continue to be developed and refined following the conclusion of the assessment process, taking into consideration the proposed timing of development activities, comments on the EIS and incorporating the Assessment Report recommendations and conclusions.