



PROJECT OVERVIEW

SECTION 1

INTRODUCTION

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Jervois Base Metal Project

VOLUME 1 Project Overview

SECTION 1 | INTRODUCTION

This Environmental Impact Statement (EIS) has been prepared in accordance with the Terms of Reference (TOR) to inform decision makers, key stakeholders and the public about the potential environmental, social and economic impacts associated with the Jervois Base Metal Project (the Project). This EIS aims to provide the Northern Territory Government and any affected or interested parties with sufficient information about the existing environment and the potential risks and impacts that may occur as a result of the proposed operations and the mitigation and management measures that will be undertaken to manage any potentially adverse impacts.

1.1. Project Proponent

Project Title

Jervois Base Metal Project

Proponent Details

KGL Resources Limited
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Environmental Record of the Proponent

KGL Resources has not been involved in, or does not have any pending proceedings under Commonwealth, State or Territory law regarding environmental or conservation matters.

KGL has a Sustainability Policy (Health, Safety, Environment, Community) which forms part of their current Risk Management Plan. This policy will form part of the Environmental Management System (EMS) and the Environmental Management Plan (EM Plan) prepared as part of this EIS.

The Jervois Mine EMS has been designed in accordance with the ISO 14001 – Environmental Management System framework. The EMS forms part of the Jervois Mine Health and Safety Management System which requires the active participation of all employees and contractors. The draft EM Plan provides the framework utilised by KGL to actively manage their environmental performance. This draft EM Plan establishes clear goals, control strategies and provides mechanisms to measure environmental performance.

To date KGL has not received any awards or other recognitions for environmental performance.

1.2. Project Overview

KGL has built upon Jervois' extensive history by successfully implementing modern, cost efficient exploration methods over the past two years to improve the knowledge of the mineral resource and in particular, increase the average resource copper grade. Geological surveys have produced high-grade intersections and expanded zones of mineralization and improved continuity. KGL are continuing to investigate, using surveying methods, to improve their knowledge of the deposits at the Jervois Project.

The reopening of the Jervois Mine will involve the extraction of existing and expanded base metal reserves within the project area. The Project contains a significant and high-grade copper resource, as well as silver, gold, lead and zinc in several deposits. The ore would be mined by open cut and underground methods and processed to a concentrate on site. The concentrate would then be trucked via the Plenty and Stuart Highways to the current rail freight terminal in Alice Springs, and then onto Darwin and/or Adelaide by rail. An option to shorten the road haulage being investigated by KGL involves the construction of a rail siding adjacent to the Adelaide to Darwin rail line north of Alice Springs on the Ghan Railway Line where it crosses the Plenty highway.

The Project footprint is estimated at 970 hectares of which a significant portion has been disturbed by historic mining activities. The Project area is located within the boundaries of ML30180, ML30182 and ML30829.

This EIS has been based upon KGL's current understanding of the resource and an allowance for potential growth. Based upon this the initial operations will focus upon optimising the recovery of the currently estimated copper resource of 25.2 Mt. These operations are anticipated to produce approximately 87 Mt of waste rock and 20 Mt of tailings. The rate of mining is influenced by the processing plant capabilities which currently allows for Run of Mine feed of up to 1.6 Mtpa, producing 150,000 tonnes of base metal concentrate per annum (assuming a two percent copper grade).

Mining operations at the Project area will be split between three operational areas:

- Reward;
- Bellbird; and
- Rockface.

Mining at Reward and Bellbird is both open cut and underground, whilst Rockface is underground only. Ore from all three mining areas will be trucked to the ROM stockpile for processing at the plant.

Mine infrastructure will include pits, waste rock landforms, tailings storage facilities, topsoil stockpiles, haul roads, heavy vehicle parking areas, ROM pads and fuel storage areas. The processing plant will include associated water tanks, workshops, fuel facilities, concentrate load out facility, mobile equipment, power plant, air and water supply facilities and storage areas.

Other infrastructure associated with the project will include laydown areas, production and monitoring bores, a magazine and explosives store, an accommodation camp, administration buildings, new sediment catchment dams, access and haul roads, monitoring and supply bores, power generation and supply facilities, workshops, hardstands and laydown areas. Proposed infrastructure will be located over previously disturbed mine infrastructure areas wherever feasible.

Once approved, it is anticipated that construction will commence in 2019, with mining and commissioning occurring in approximately 2020. It is currently anticipated that there will be up to 360 people employed to facilitate the construction requirements and up to 300 for the proposed project operations.

1.2.1. Location of the Project

The Jervois Project is located approximately 383 kilometres (km) by road (270 km as the crow flies) north-east of Alice Springs in the Northern Territory of Australia. Road access to the Project from Alice Springs is via the Stuart and Plenty highways, this being 68 km north along the Stuart Highway, 296 km east on the Plenty Highway to the Lucy Creek property turnoff and 19 km down road number 194 to the mine access. Of the 383 km, the Stuart Highway is sealed to full width, 97 kilometres is sealed along the first section of the Plenty Highway with all the other parts of the route being unsealed.

The Jervois Project is located approximately 375 km as the crow flies and almost 450 km by road west of Boulia being 201 km along the Plenty Highway to the Queensland border, 239 km along the Donohue Highway and 7.5 km along the Boulia Mt Isa Highway.

The Project is located within the 273,600 hectare (ha) Jervois Pastoral Lease owned by Jervois Pastoral Company Pty Ltd. The 970 ha Project footprint equates to approximately 0.35% of the Jervois Pastoral Lease. The Lucy Creek and Jervois homesteads are located approximately 24km north and 35km south of the Project respectively.

The Project is located within Exploration Licence (EL) 25429 and several Mineral Leases held by Jinka Minerals Limited, a 100% owned subsidiary of KGL Resources as detailed in Table 1-1.

Table 1-1 Project Tenure Details

Tenure No.	Status	Grant Date	Expiry Date	Holder	Area (Ha)
ML 30180	Granted	28/01/2014	27/01/2024	Jinka Minerals Limited	33.21
ML 30182	Granted	26/03/2014	25/03/2030	Jinka Minerals Limited	482.8
ML 30829	Granted	18/08/2017	17/08/2032	Jinka Minerals Limited	1,438
EL 25429				Jinka Minerals Limited	Approximately 3,800

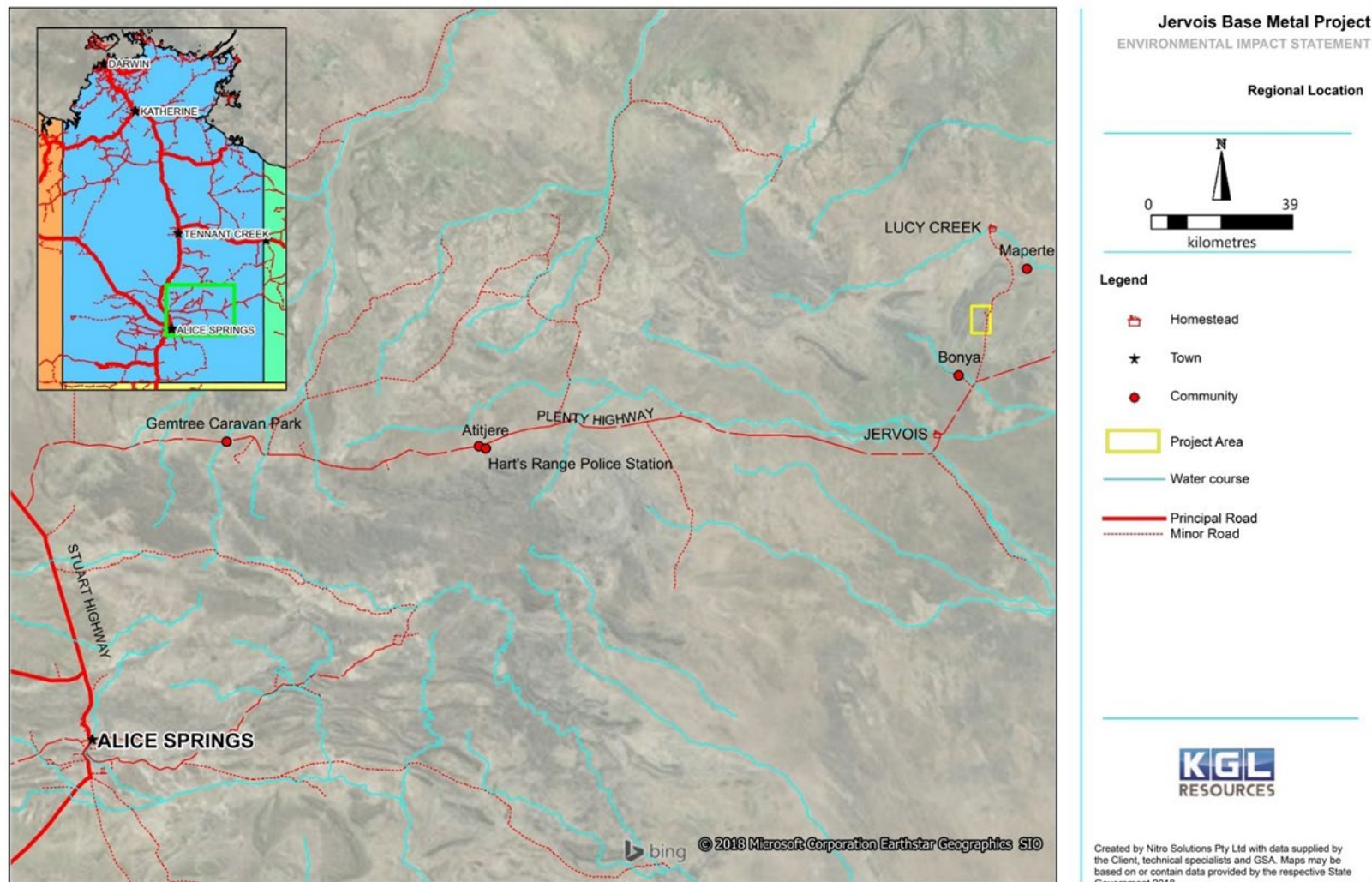


Figure 1-1 Jervois Project Regional Location

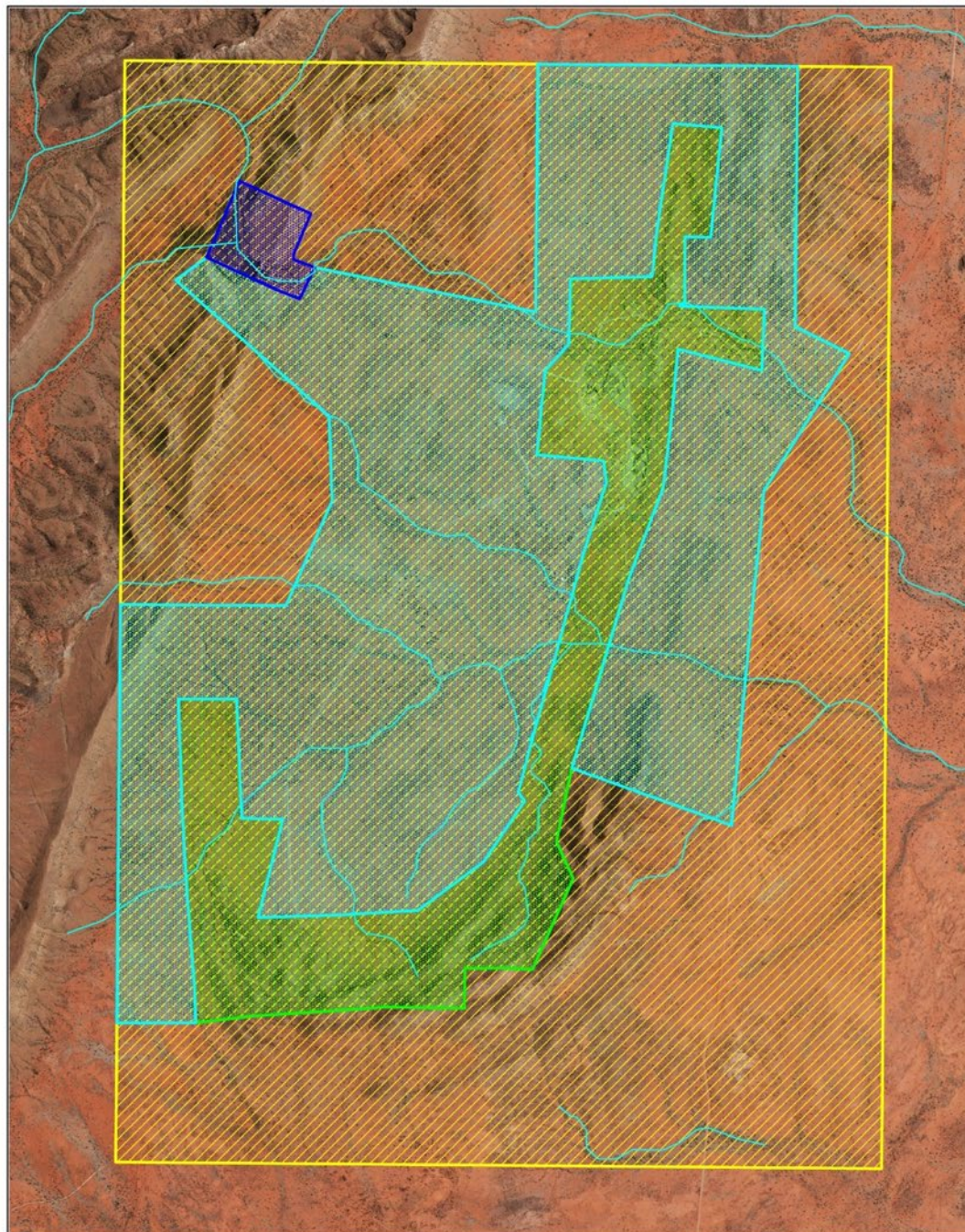


Figure 1-2 Jervois Project Tenures

1.3. Regional Context

1.3.1. Landmark Features and Infrastructure

The Jervois Project is named after Jervois Range, a generally north-south trending range about 250 metres high which separates the shield of Central Australia from the plains to the east. The Project area lies at the south edge of the Channel Country bioregion and is located almost entirely within the Jervois Range Site of Botanical Significance (SoBS) which is of bioregional significance.

Sites of Cultural and Historic Significance

The Project area has been surveyed several times by both the Central Land Council, incorporating assistance from the Traditional Owners and more recently by Archaeologists for the purposes of the technical requirements associated with the EIS process. During a 2018 survey, five archaeological sites, four background scatters and 41 isolated artefacts of Aboriginal origin were recorded within the Project. Of the five archaeological sites, three were classified as minor quarries, one was described as a quarry site and one a minor lithic scatter. Another site was classified as a quarry site and the last site was classified as a low density lithic scatter. Field surveys also recorded 62 historical features which relate to the previous mining, exploration and possibly pastoral activities (Earthsea, 2018). The majority of these sites are considered to have a relatively low heritage significance with one considered to be of low to medium significance.

These cultural and historic sites are described in detail in Section 3.3.

Sites of Social Significance

There are two Aboriginal communities within 20 km of the Project. The Bonya Community is approximately 17 km to the southwest and the Maperte Community is approximately 16 km to the northeast. Bonya currently has approximately 20 residents and has accommodation for approximately 80 people. The Maperte Community consists of only two abandoned houses. Other regional community centres include the Atitjere Community, also known as Harts Range, which is located along the Plenty Highway approximately 160 km west of the Project and the Gemtree Caravan Park which is located along the sealed section of the Plenty Highway. The major regional community centre of Alice Springs is located approximately 380 km south west of the Project.

Further details on these sites of social significance are provided in Section 3.4.

Sensitive environments

The Jervois Project area is in the upper catchment of the Hay River Basin, which ultimately feeds into Lake Eyre in the north of South Australia. The drainage lines that intersect the project area feed into the Marshall River to the south and Arthur Creek to the north, which in turn converge into the Hay River, approximately 60 kilometres south-east of the project area. The only watercourse of note in the Project area is Unca Creek, which is ephemeral. The largest and most permanent surface water body in the Jervois region is Jervois Dam.

There are no Sites of Conservation Significance within 20 km of the Project area. No communities or flora species listed under the EPBC Act located in the Project area.

Hydrogeology of the area can be divided into two distinct groundwater systems: the Georgina Basin and the Arunta Region (which hosts the Jervois Mine ore bodies). Groundwater from the Georgina Basin Carbonate Aquifer does not discharge to surface within the study area and the water table ranges from 20 to 80m below ground surface. Groundwater resources in the Jervois Mine area are very poor due to the limited open fracturing and lack of primary porosity of the Proterozoic rock.

Sensitive environments related to the Project are discussed in detail in Section 3.1.

Discussion of the location of public and private infrastructure is provided in Section 2 Project Description. Where relevant, detailed discussion and assessment of this infrastructure is provided within the Volume 3 Existing Environment and Volume 4 Impact Assessment. Components considered as part of the EIS process are wide ranging and include but are not limited to the following elements:

- Transport infrastructure, such as airstrips, road, rail and port
- Communication networks
- Health services infrastructure
- Community infrastructure
- Water infrastructure; and
- Power infrastructure.

1.3.2. Relationship to Other Projects and Actions

The Northern Territory Government has identified five significant resource projects in the Central Australian and Barkly Regions which have received NT major project status and have expected commencement dates in the coming two to five years. They have estimated that these projects have a capital expenditure of \$2.2 billion and the potential to create over 2,000 jobs throughout their construction and operational phases. The purpose of this “Five Mines Project” is to design a coordinated program which will ensure businesses and individuals have appropriate skill levels, capabilities and knowledge to enable them to benefit from opportunities created by these projects. The Jervois Base Metal Project has been identified by the Northern Territory Government as one of these “Five Mines” and as such, a link to other projects in the NT has been created.

Northern Territory Government reporting as at September 2018 indicates that the other major projects are unlikely to commence within the Projects construction timetable.

Other than the Northern Territory Government Five Mines Project, the Jervois Base Metal Project does not directly relate to any other third party proposals or actions that have been or are being undertaken or approved in the region (current as at June 2018). KGL Resources may instigate relationships with other projects in the region should they proceed with their investigations into an option to construct a rail siding on the Ghan Railway Line where it crosses the Plenty highway north of Alice Springs. The construction of this proposed rail siding would be dependent on the development of agreements with other third party users in the region.

In June 2018, the NT Department for Infrastructure, Planning and Logistics released an announcement on the approval of funding toward the upgrade of the Plenty Highway. These works are to include approximately 20 km of sealing and flood resilience works to be completed on a priority section of the highway. This project is part of the plan to target high-priority roads essential to the movement of people and freight which supports the development of the North. At the time of preparation of this EIS, the timeframe for these works is not known.

The closest mine in the region is The Granites Gold Mine which is operated by Newmont Tanami Pty Ltd located approximately 550 km north west of Alice Springs. The Nolans Bore rare earths Project 135 km north of Alice Springs is operated by Arafura Resources Limited. The NT EPA has recently completed their assessment of the Nolans Project EIS and has provided advice to the NT Government for consideration of an environmental approval decision.

Numerous exploration sites are also located in the region, including those listed in Table 1-2.

Table 1-2 Exploration Sites in the Region

Site	Operator	Resources	Approximate Location
Bonya Project	Rox Resources Limited	Copper	Jervois Station via Alice Springs
Dulcie Project	Oates Tom	Copper, Lead, Zinc	240km north east of Alice Springs
Inkheart Project	Core Exploration Ltd	Silver, Copper, Lead, Zinc	270km north east of Alice Springs
Jervois Project	Core Exploration Ltd	Silver, Base Metals, Copper	270km north east of Alice Springs
Molyhil Mine	Thor Mining PLC	Tungsten/Wolfram, Molybdenum	240km north east of Alice Springs
Ooratippra Project	CKA Resources Pty Limited	Gold, Base Metals, Copper	300km north east of Alice Springs

Source: Northern Territory Government Department of Primary Industries and Resources Authorised Mine, Extractive and Mineral Exploration Sites, 2018

1.4. Project History

The Jervois Project has a rich history and is well known within the region with exploration and mining activities occurring for almost 90 years. Since KGL have owned the Jervois Project they have formed a good working relationship with the local pastoralists and the Bonya community. The KGL Executive Chairman has a longstanding reputation for working closely with local communities and as a result, a strong link has been developed which KGL is committed to maintaining into the future.

Whilst the history has been checkered by sporadic exploration and mining activity since 1929 the common feature is that of a rich deposit that offers new discoveries and potential with each fresh perspective. KGL has built upon these findings to establish a base metal mining project which encompasses the full diversity of this geological deposit whilst focusing upon delivering copper product demanded by the global markets. This focused approach upon copper as the main product paired with technological advancement in mining and processing methods has enabled KGL to create an economically feasible project.

Base metals were first discovered in the Jervois Range area in 1929 during the mustering of stray cattle on a track leading from Tobermorey on the Northern Territory/Queensland border. Small scale mining commenced and a small mining settlement was located at Jervois in the 1930s (Hodge-Smith 1932). In the 1950's, leases covering the area were acquired by Kurt Johannsen, who mined copper carbonate on a small scale for the fertiliser industry and later as a flux in the smelting process at Mount Isa. Since then, numerous companies have owned the Project and conducted exploration and mining activities.

Table 1-3 Project History

Project History	
1929 – 1950	Tom Hanlon and others Base metals discovered Early prospecting and small scale mining activities Resource potential assessed by BHP geologist
1952 - 1962	Kurt Johannsen Small scale mining, construction of processing plants and pits
1961 – 1965	New Consolidated Goldfields (Australasia) Pty Ltd New Consolidated Goldfields undertook the first modern systematic exploration program.
1963 – 1977	Jervois Mining Limited Jervois Mining Limited operated a small scale copper mine.
1969 – 1973	Petrocarb Mineral Exploration

	Petrocarb Mineral Exploration (SA) Pty Ltd acquired certain key leases in 1969 – 1970. During 1971 and 1972 intensive diamond drilling and lesser percussion drilling took place to test the known mineralised horizons. Approximately 110 holes were drilled on the Reward, Marshall and Green Parrot Prospects.
1973 – 1974	Petrocarb Joint Venture A joint venture agreement between Petrocarb Exploration NL, Wilstone Pty Ltd and Union Corporation (Australia) Pty Ltd was negotiated in late 1973, whereby Union Corporation would undertake exploration in the Jervois area.
1980 – 1983	Plenty River Mining The Jervois area remained inactive between 1975 and 1980 when Plenty River Mining Company NT Limited negotiated a tribute agreement with Petrocarb, whereby Plenty River would be assigned the leases in return for payment of a royalty on production. A treatment plant designed to treat Green Parrot lead-zinc-copper-silver ore at a rate of 125,000 tpa was completed in early 1982, together with township and services, at a cost of AUD15 M. Open pit mining at Green Parrot using company equipment commenced in 1982, and the plant was successfully commissioned in April 1982. It was then placed on care and maintenance in June 1982 after having produced about 500 t of concentrate. The plant was again commissioned in August 1983 and operated on Green Parrot oxidised ore for five months, treating 25,000 t. Due to a sharp decline in metal prices the plant was placed on care and maintenance in December 1983 and has not operated since.
1983 – 1984	Plenty River Mining – Anaconda Joint Venture With the objective of discovering a large stratiform base metals orebody of the Broken Hill type, Anaconda Australia Inc. negotiated a joint venture agreement with Plenty River Mining in September 1983.
1984 - 1987	Regional Drilling Some diamond drilling was completed including holes to test airborne magnetic anomalies in the Bellbird and Green Parrot South areas. No significant mineralisation was intersected and the targeting of further magnetic anomalies was abandoned. Core holes were also drilled at Van Gils Prospect on the Outer J line of mineralisation which were not encouraging. Diamond drill holes were also completed at Killeen yielding zinc/lead intersections.
1991 – 1996	Plenty River Mining – Normandy Poseidon Joint Venture Plenty River Mining reached an agreement with Normandy Poseidon in October 1991, whereby Poseidon Exploration Limited would extend their exploration program.
1997 – 1999	Britannia Exploration In 1997 Britannia Gold NL carried out a survey and RC drilling program following acquisition of the tenements from Tyson Resources who held an option to purchase from Plenty River Mining.

1999 – 2001	MIM Exploration Pty Ltd In early 1999, Britannia Gold NL offered the exploration lease and mine leases as part of a Joint Venture package to MIM Exploration Pty Ltd. MIM Exploration entered the Joint Venture agreement as manager and operator in August 1999 and conducted several surveys, studies and test work.
2004	Reward Minerals When Reward Minerals assumed control of the Project in April 2004, they began the first of a series of drilling campaigns aimed at investigating the established prospects in detail, as well as extending exploration to other parts of the large tenement holding to identify additional prospects. Drilling focused on the Bellbird, Green Parrot, Reward and Marshall deposits. Intense mining activity in Australia hampered the drilling program due to difficulties in sourcing suitable drilling contractors willing to work in such a remote location.
2009	Jinka Minerals Jinka Minerals was spun out of Reward Minerals. Jinka Minerals acquired the tenements in 2009 (Jinka Minerals 2011).
2011	KGL Resources Kentor Gold Ltd (now KGL Resources Ltd) acquired Jervois through acquisition of Jinka Minerals Ltd. KGL has conducted drilling programs each year since the acquisition and has steadily increased the size and confidence of the resource.

Source: Lycopodium Minerals Pty Ltd. (2014). Pre-Feasibility Study Report, Jervois Copper Project. Earthsea Pty Ltd. (2018). Archaeological Desktop Assessment and Survey Report: KGL Resources Jervois Base Metals Project, EL25429 Plenty Highway, Northern Territory.

1.4.1. Historical Disturbance

There is a substantial amount of existing disturbance for the Jervois Project site a result of the historical activities within the area. As indicated in Figure 1-3 historic mining disturbance includes tailings storage facilities, waste rock dumps, decommissioned processing plants and equipment, pits, prospecting trenches, ROMs, water storages and evaporation ponds, an exploration camp, exploration disturbances, roads and tracks. The existing disturbance covers an area of 163.15 ha which equates to approximately 16.8% of the proposed Project footprint area of 970 ha as categorised in Table 1-4. The total disturbance area calculation of 389.45 ha includes 32.46 ha of new infrastructure being located over existing disturbance areas. These will include the camp, processing plant, administration and workshop infrastructure, some haul and access roads and part of the tailings dam.

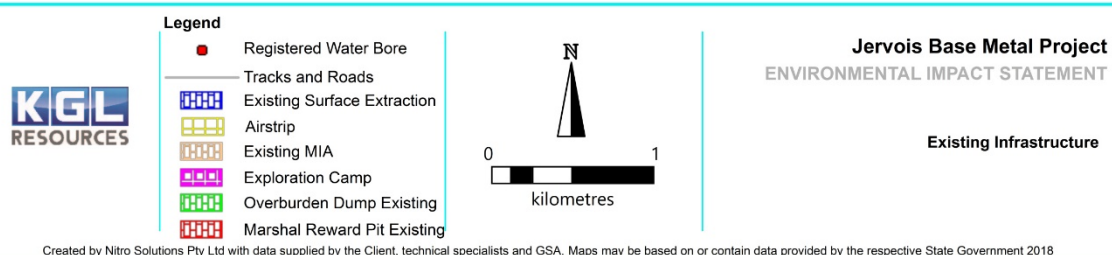
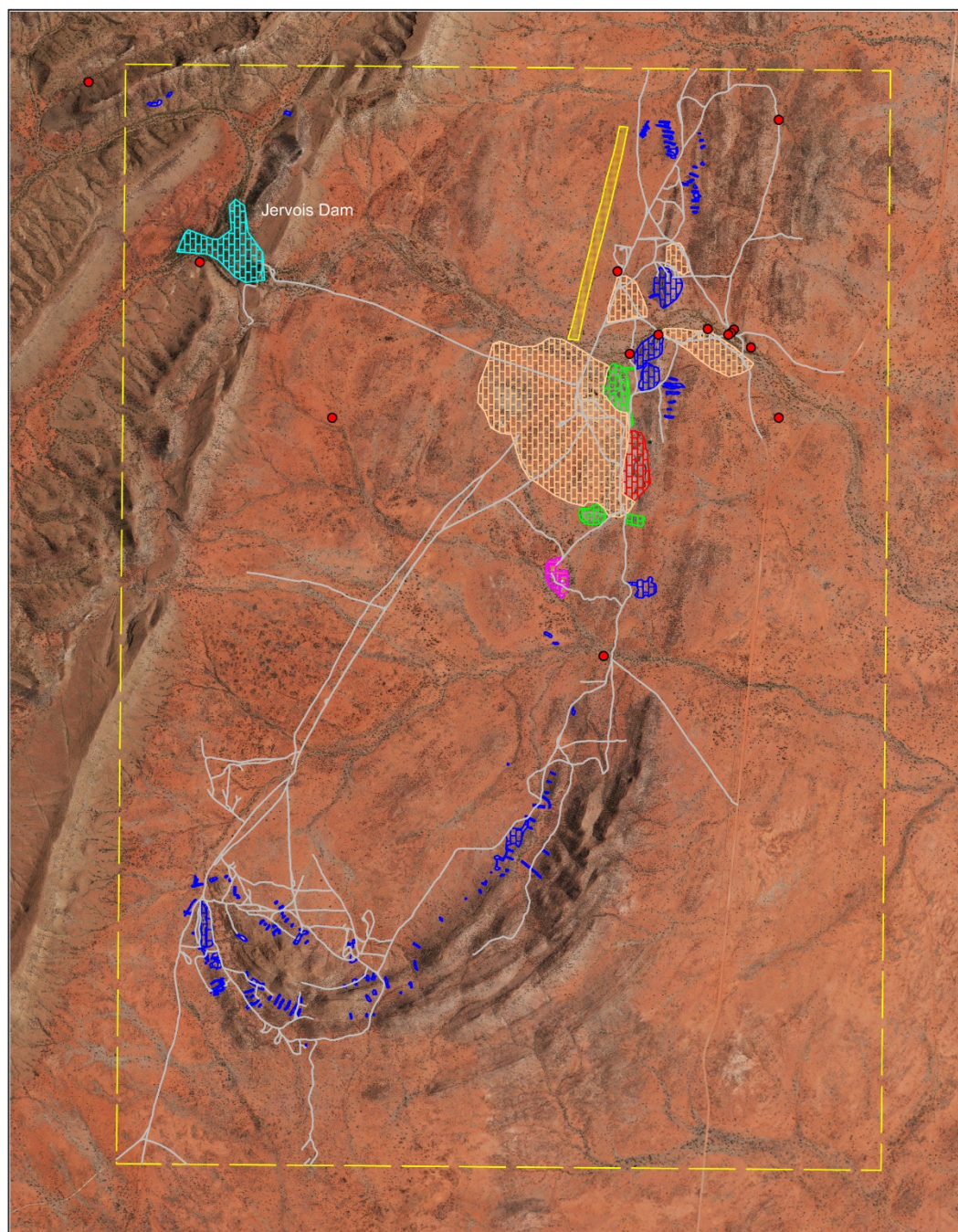


Figure 1-3 Historic Mining Disturbance

Table 1-4 Project Disturbance Area Estimates

Description	Existing Disturbance Area (ha)	Additional Disturbance Area (ha)	Total Disturbance Area (ha)
Mine Pits	25.83	23.84	49.67
Infrastructure	94.61	19.98	114.59
Jervois Mine Dam	6.68	0.00	6.68
Dams and Reservoirs	2.46	12	14.46
Tailings Dams	4.98	119.68	114.70
Stockpiles and Waste Rock Dumps	7.24	59.36	66.60
Exploration Areas	2.63	0.50	3.13
Roads and Tracks	18.72	8.40	24.60
Total	163.15	236.26	389.45

1.5. Project Objectives, Benefits and Justification

1.5.1. Ecologically Sustainable Development

This section considers the concepts of ecologically sustainable development (ESD) which form an integral part of the EIS process. Part (Section 3) *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* provides the principles of ESD as:

- Decision-making processes should effectively integrate long-term and short-term economic, environmental, social and equitable considerations.
- If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- The principle of inter-generational equity that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.
- Improved valuation, pricing and incentive mechanisms should be promoted.

The Project, this EIS and engineering design have been conducted in a manner that this consistent with ecologically sustainable development principles and the National Strategy for Ecologically Sustainable Development.

Project decision-making and planning addressed the principles of ESD by integrating the following: the findings of the project risk assessment; economic and financial modelling outputs; the findings of supporting environmental assessment studies; and outcomes of key stakeholder engagement. These points have all been considered when conducting the Project alternatives assessment.

Examination of alternatives gave the opportunity to establish the preferred or most environmentally friendly option for achieving proposal objectives. A priority at this stage is the conservation of biological diversity thus exercising the Biodiversity Principle (Environment Australia 2003). Considering different options also highlights the need for the integration of both long-term and short-term economic, environmental, social and equitable considerations: The Integration Principle (Environment Australia 2003).

To satisfy the ESD principle emphasis was placed on anticipation and prevention of environmental damage (i.e. being proactive rather than reactive). The environmental impact assessment is precautionary in nature, as it assesses and evaluates uncertainty about the environmental

consequences of a development prior to a project proceeding. Project Risk Assessment (Appendices C-11– Risk Assessment Report) identified the hazards and risks associated with the preferred alternatives and to propose appropriate controls and mitigation measures where required.

The Principle of inter-generational equity requires the present generation to ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. Intra-generational equity refers to equity across communities within one generation. The potential social and economic benefits and impacts of the Project, along with mitigation measures, have been identified and quantified in Section 4.7 – Social Economic and cultural surrounds.

Conservation of biodiversity has been a fundamental consideration in Project decision-making. Existing nature conservation values have been identified and the potential impacts described and quantified in Section 3.2 and Section 4 respectively. ESD requires that Project decision-making considers and internalises environmental costs. Refer to the Section 4.7 – Socio-Economic Environment and Appendix C-10– Economic Report) for further details.

1.5.2. Project Objectives

The overall objective for the Project is to create a robust, low cost producer that can sustain its viability during times of fluctuating international base metal markets. The target commodity is copper with subordinate lead, zinc and potentially silver and gold.

The Project will be financially beneficial to both the Northern Territory and Australian Governments through the payment of royalties and taxes as the worldwide copper demand is increasing. This demand can be attributed to several factors including:

- projected decreasing global copper production
- its use in the construction and operation of high-performance green buildings, high efficiency motors, lighting and electrical systems and solar panels
- strong economic growth in developing countries
- the explosion of the electric vehicle, renewable energy and technology markets
- the increased benefits of copper as an antimicrobial material in the medical profession; and
- its high efficiency in heat transfer.

Project Benefits

The Social Impact Assessment stakeholder engagement process identified that there was general optimism about the Project within the local and regional communities due to the benefits it could bring to Central Australia. The positivity from the community included social and economic benefits such as:

- direct and indirect jobs and training for local communities
- jobs for Alice Springs residents
- training and upskilling a local workforce
- boosting regional and local economies
- work for local businesses
- potential acceleration of the upgrading of the Plenty Highway
- distribution of sponsorship funds
- improved educational outcomes for local indigenous people; and
- opportunity for community members to return to Bonya and surrounds.

Economic opportunities provided by the Project have the potential to benefit the following organisations and stakeholders:

- Harts Range community store
- Bonya store and indigenous artwork sales

- Bonya Enterprise Development Program
- Jervois Station store and fuel stop
- Local pastoralists through the use of them for some services and minor works
- Alice Springs through FIFO worker transition
- Gemtree fossicking area; and
- Local community groups and events.

Copper has been described as a “noble” metal as it possesses numerous beneficial features including:

- corrosion and oxidation resistance
- superior thermal and electrical conductivity
- being readily reusable
- having a long lifespan
- requiring low maintenance
- it is 100% recyclable
- being one of the most easily recyclable metals; and
- a high conductivity.

As a building material, the benefits of copper include its durability, long lifespan and low maintenance attributes. Copper is used in roofing, wall cladding, guttering and downpipes, wiring, plumbing, light and bathroom fittings.

Whilst copper is a crucial material in building and construction its use in electric cars, solar panels, mobile phones and charging infrastructure is increasingly driving demand. Wind and solar generation installations require multiple times the amount of copper used to generate the same amounts of electricity in coal and gas-fired power plants – reportedly five times in wind installations and two and a half times in solar installations according to some estimates.

Electric vehicles require up to four times more copper (80 kg) than a petrol vehicle (20 kg). It has been estimated that copper demand from the growing electric vehicle market is set to increase tenfold to 1.74 million tonnes (Mt) in the decade to 2027. Some studies have estimated that if electric vehicle sales grew to account for 30% of the market by 2030, the world would need an additional 4.1 Mt of copper which is equivalent to 18% of the 2017 supply.

A prediction of a 25% increase in copper demand over the next decade (CRU Group) is expected to be driven by the major emerging economies of China and India which are experiencing rapid growth in electricity distribution and household consumption. There is scope for China’s lower tier cities and vast countryside regions to catch up with the urban lifestyles experienced in their mega-cities with India’s urban masses being decades behind their Chinese counterparts.

Some reports state there is a copper supply deficit looming with existing mines at full capacity, declining grades and a shortage of new projects coming into production. Many markets have predicted deficit forecasts as early as 2019 with a resulting upward trajectory of the copper price. Following a 27% increase in the annual average prices for copper from 2016 to 2017, markets have predicted an 8% increase this year and further rises to US\$7,500 per tonne in 2020 (the copper price on 26 September 2018 was US\$6,319/tonne).

The global copper market outlook is favourable for KGL as the Jervois Base Metal Project is located in a country that is politically and economically stable compared to other copper producing countries such as Africa. The timing of the Project in the global copper demand market can be expected to enhance its viability and profitability from the outset.

Lead is a very stable, soft and ductile metal which has a relatively low melting point. The largest use of lead is in batteries for vehicles, which accounts for 80% of modern lead usage. The remaining 20% of lead use includes weights and ballast, underwater cable sheathing, solder, casting alloys, chemical

compounds, including PVC plastics and pigments, ammunition, glassware and radiation protection. Future lead use could potentially increase for large battery storage and electric bikes.

Zinc (Zn) is the most common metal used after aluminium, copper and iron and used extensively in the construction, transport and appliance manufacturing industries. Zinc is a versatile material and can be recycled infinitely and is predominately used for anti-corrosion coatings (galvanising) on sheet steel, steel beams, vehicle panels, chain-link fencing, guard rails and light posts.

1.5.3. Project Alternatives

In consideration of these objectives, KGL has investigated alternatives to the Jervois Project and modifications to the design of the Project in response to the outcomes of the environmental assessments conducted as part of the EIS. This has involved consideration of:

- the 'do nothing' alternative; and
- alternative project design options.

The Project alternatives are discussed in more detail in the following sections. Consideration has been given to the social, environmental and economic benefits of the Project in comparison to these alternatives. Social impacts and benefits of the Jervois Project are discussed further in Section 4.7 – Social, economic and cultural surrounds.

Do Nothing

As outlined within Section 4.7 the Project will be financially beneficial to the local and regional economies as well as the Northern Territory and Australian Governments. The negative consequences of not proceeding with the Project include:

- Reduced taxes and royalty payments to the Northern Territory Government
- Reduced taxes paid to the Australian Government
- No contribution to reducing local and regional unemployment rates
- Limited opportunity to train and upskill local people
- Reduced opportunities for local and regional economies
- No contribution to local and regional businesses through the need for suppliers and services
- A reduced possibility for infrastructure upgrades including the Plenty Highway
- Less opportunity for educational improvements for local indigenous people
- Not upgrading the Bonya or Lucy Creek airstrips; and
- No contribution to worldwide copper supply.

The positive consequences of not proceeding with the Project include:

- Not providing competition for local and regional employees, services and suppliers
- Less impacts on local business productivity
- Reduced impact on the displacement of other economic sectors through crowding out
- No impact on local indigenous communities from Project employees
- No increases in traffic and potential road dangers along the Plenty Highway
- No honeypot effect from the influx of people back to communities
- No impact on the ability of people to enjoy the natural environment
- Reduced fear of impacts to water resources
- Reduced impact on community or social cohesion
- Less anxiety for native title holders due to rumours and misinformation
- Less pressure on local health, police and emergency services
- No potential for workplace deaths or injuries
- No impact on the sense of safety and wellbeing in nearby communities
- Less opportunity for cultural offence and impacts to cultural and spiritual connections to country; and
- No potential for impacts on human rights.

Alternative Project Design Options

The Project design options are demonstrated by the retraction in footprint and impacts associated with the proposed operations. During the course of the project approvals process the current mine plan has reduced from five (5) pit areas to three (3) with the associated dumps also retracting. The Tailings Storage Facility (TSF) has reduced from four (4) cells to two (2). The Jervois Dam upgrade was limited to a height which ensures that the extents of flooding remain removed from known heritage sites within the catchment area.

1.6. Future Activities

Going forward, KGL aim to improve the quality of the resource and focus on the drilling necessary to allow the Project to proceed. Future work will comprise upgrading and expanding the resource estimates with the resource estimate upgrading to be greatly assisted by developing an improved geological model utilising all aspects of geoscientific data and research conducted by CSIRO. Recently completed detailed surface mapping and channel sampling work could also help with the upgrade. Expansion of the resource estimates would involve drilling in selected areas peripheral to the current resource both within the mineral wireframes and down dip of favourable drillhole intersections.

Jinka Minerals Ltd (a 100% owned subsidiary of KGL) also holds EL28082 which boundaries EL25429 to the north, east and south (Figure 1-4). KGL acquired the Unca Creek tenement in 2017 for its considerable strategic value beyond the development of the Jervois Base Metal Project. Previous exploration and more recent investigations by KGL have identified the potential for economic mineralisation on this tenement. Unca Creek has geological similarities to the Jervois Project with a strong copper trend extending north from the Marshall-Reward deposits. Investigations have also shown an additional potential in the southern area of Unca Creek. KGL plans to continue identifying priority drilling targets on this tenement.

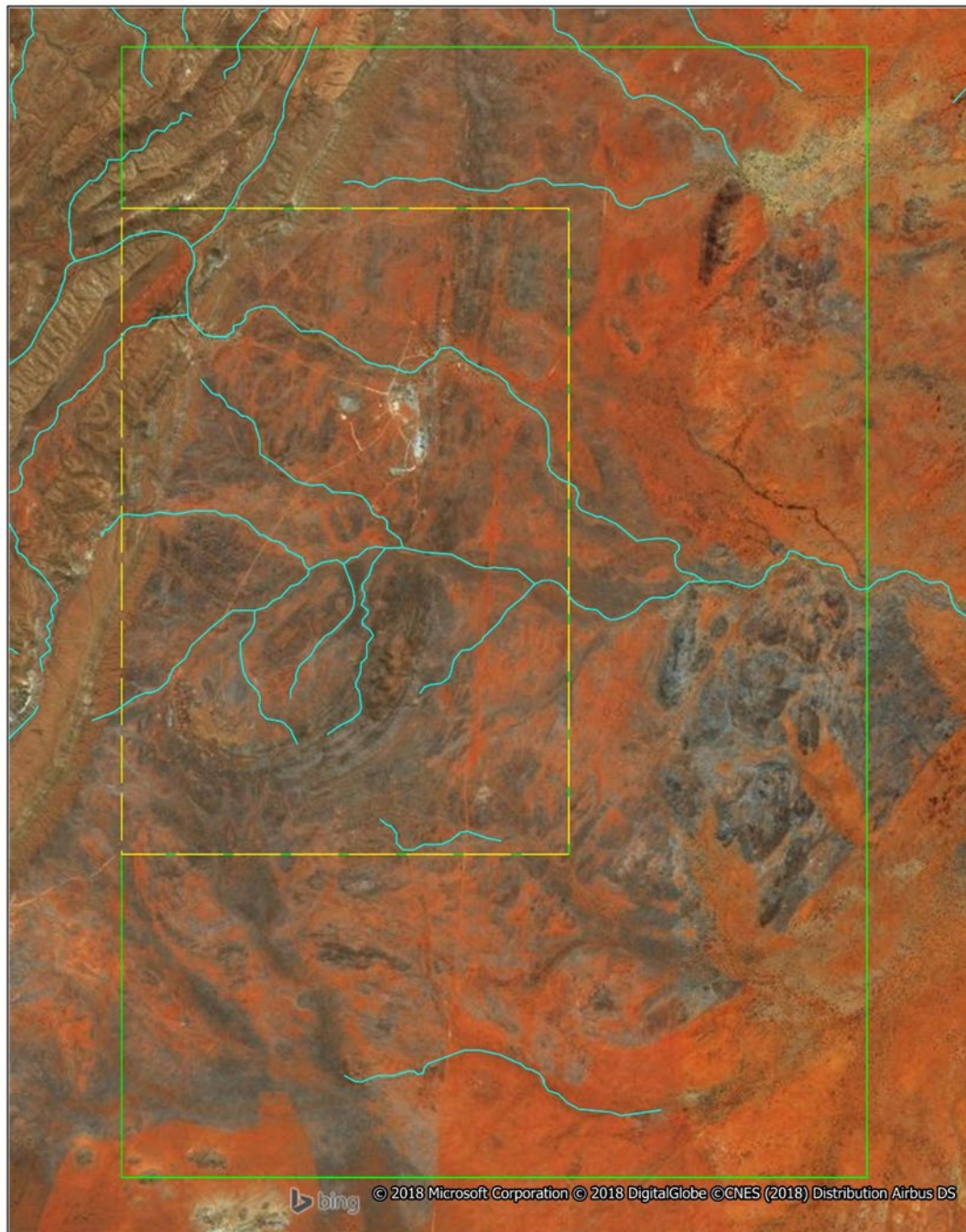


Figure 1-4 Unca Creek EL28082

1.7. The Environmental Impact Statement Process

This EIS has been prepared in accordance with the provisions of the Environmental Assessment Act 192 (EA Act). Further information about this process, specific to the Jervois Project is provided within this Section.

1.7.1. Approvals History

The approvals process can be commenced upon the basis of one of three key mining planning phases being the concept, prefeasibility or detailed feasibility studies.

KGL originally submitted their Notice of Intent (NoI) in 2013 based upon a Prefeasibility Study that was conducted at this time. This allowed for the benefits of environmental planning considerations influencing engineering design KGL elected to commence the environmental impact assessment process at the time of prefeasibility works completion. This has allowed for the evolution of a mine plan that is cognisant of the existing environment and the best approach to facilitating progressive rehabilitation without sterilisation of the known geological resources.

Since the original Notice of Intent (NoI) submission in 2013 the proposed Jervois Project has evolved as a result of the risk management and impact assessment processes as well as the geological investigations discussed in Section 3.1 Physical Environment.

Jervois Project

Previous environmental impact assessments include field surveys focusing on landscape, flora and fauna by Low in 1999, 2012, 2013 as well as a desktop study of the Project by MBS Environmental in 2013 on behalf of KGL Resources for the purposes of preparing a Notice of Intent (NOI) to Mine. This NOI was submitted to the Northern Territory Department of Mines and Energy in November 2013 for a determination on the appropriate level of environmental assessment for the Project. In February 2014 the NT EPA advised that an EIS was required for the Jervois Project. Between the 10th and 23rd of May 2014 the Northern Territory Environment Protection Authority (NT EPA) advertised draft Terms of Reference (ToR) for public review. In late May 2014 the ToR was finalised by the NT EPA and KGL Resources was directed to prepare a draft EIS and submit it within three years.

As a result of numerous project developments and internal changes within KGL, a notice of an alteration to the Project under clause 14A of the Environment Assessment Administrative Procedures (EAAP) to the 2013 NOI was submitted to the NT Department of Primary Industries & Resources in January 2017. As a result, the NT EPA revised the ToR, advertised the draft document for public review between the 14th and 28th of July 2017 and reissued the final ToR to KGL in August 2017.

Table 1-5 Terms of Reference History

KGL Timeline

Nov 2013	Notice of Intent (NOI) submitted to the NTG
Feb 2014	NT EPA determined the project required formal assessment at the level of an Environmental Impact Statement (EIS)
May 2014	NT EPA issued Terms of Reference (ToR)
Dec 2014	Jervois Copper Project Pre Feasibility Study Report
Aug 2015	Jervois Copper Project PFS Update
Jan 2017	Section 14A variation to the 2013 NOI submitted to the NT EPA
Mar 2017	NT EPA determined that the environmental significance of the project has not changed, and the altered project will continue to be assessed at the level of an EIS.
Aug 2017	Final ToR issued.

The Final ToR is reflective of a holistic approach to environmental impact assessment and highlights the interconnectedness of the environment, socio-economic and cultural aspects associated with the project. KGL recognises this approach to impact assessment allows for a better regulatory understanding and decision-making process and therefore has developed this EIS in a manner that adopts the layout specified by the ToR.

1.7.2. Methodology of the EIS

As guided by the ToR this EIS has been structured to provide a holistic understanding of the Jervois Project by essentially establishing the context of before, during and after project operations with a focus on identifying the potential risks and impacts and sequentially identifying operationally functional means of managing and avoiding these items.

The methodology for preparing an EIS in the Northern Territory is underpinned by the EA Act typically consists of up to seven stages. These stages and the approach to each is outlined below in Figure 1-5.

Jervois Project EIS Methodology

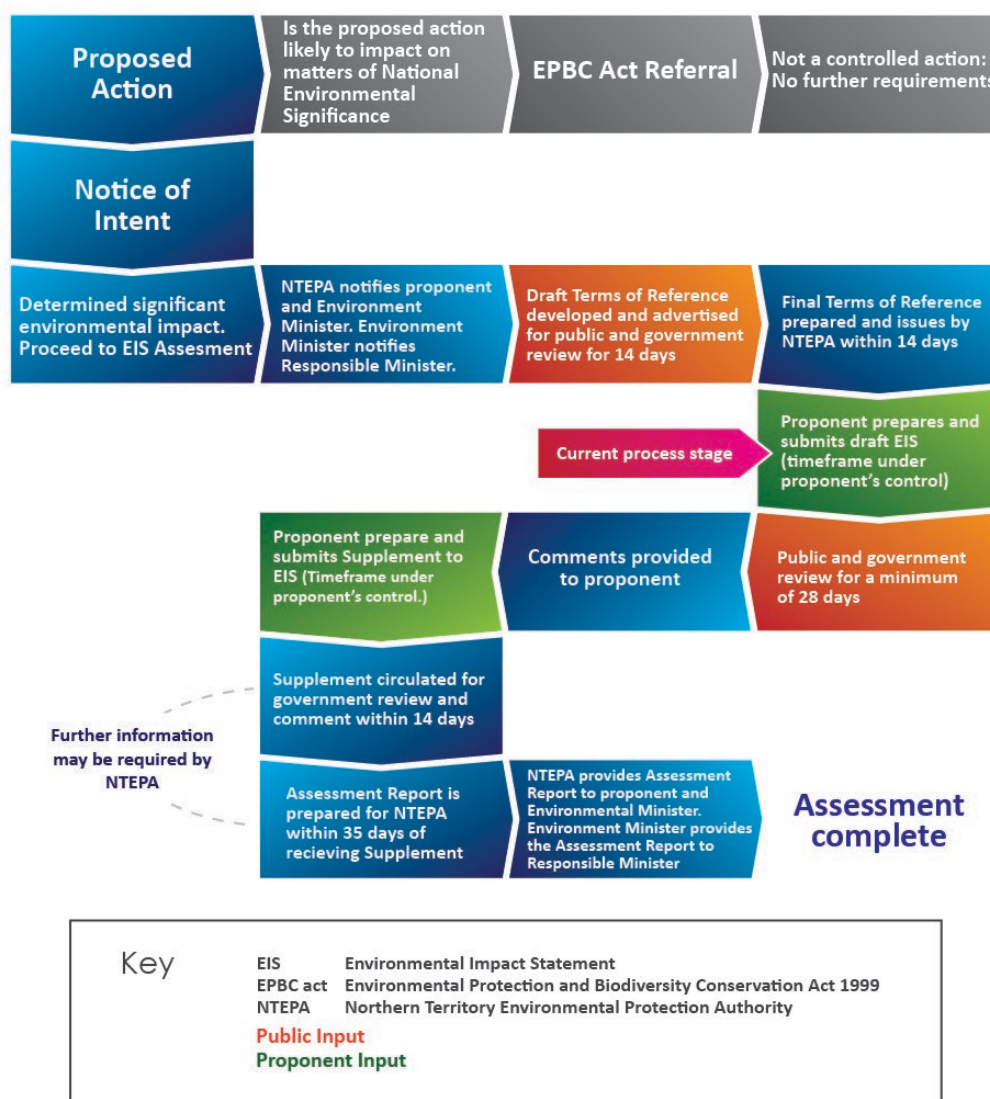


Figure 1-5. Jervois Project EIS Methodology

1.7.3. EIS Objectives

The primary objective of the EIS is to ensure that the potential environmental, social and economic risks and impacts associated with the Jervois Project are identified, evaluated and appropriately managed. In doing so, the EIS sets out to provide sufficient information to inform regulatory agencies, decision-makers and the general public. The audience of the EIS includes community stakeholders, landholders within and adjacent to the Project area, government bodies, referral agencies and the Proponent.

The EIS aims to inform each of these stakeholders by providing:

- A basis by which to understand the Project, feasible alternatives, risks and potential impacts to environmental values and mitigation measure to address identified adverse impacts
- Information regarding the impacts for those directly affected by the Project
- A decision-making framework for regulatory agencies to assess potential impacts of the Project and make an informed decision on whether the Project is approved, and under what conditions; and
- Information to support strategies and management measures that the Proponent can adopt to manage potential impacts of the Project.

1.7.4. EIS Structure

The contents of this EIS reflect the requirements of outlined in the final ToR prepared for the Project (provided in Appendix A). This EIS has been prepared by NITRO Solutions Pty Ltd (NITRO) on behalf of KGL Resources, addressing and describing the following elements and aspects in accordance with the Project ToR:

- Section 1 – General project information including Project need and alternatives
- Section 2 – Project Description
- Section 3 – Existing Environment
 - Section 3.1 – Physical Environment
 - Section 3.2 – Biological Environment
 - Section 3.3 – Cultural and Historical Environment
 - Section 3.4 – Socio-Economic Environment
- Section 4 – Impact Assessment
 - Section 4.1 – Terrestrial Flora and Vegetation
 - Section 4.2 – Terrestrial Environmental Quality
 - Section 4.3 – Terrestrial Fauna
 - Section 4.4 – Hydrological Processes
 - Section 4.5 – Inland Waters Environmental Quality
 - Section 4.6 – Air, Greenhouse Gas and Noise
 - Section 4.7 – Social, Economic and Cultural Surrounds
 - Section 4.8 – Human Health
 - Section 4.9 – Cumulative Impacts – landscape, biophysical, social economic
- Section 5 – Environmental Management
- Section 6 - Appendices

Each aspect has addressed and examined for the following:

- Applicable legislation and policy
- Methodology
- Existing environmental values
- Potential risks and impacts
- Mitigation measures; and
- Residual risks.

1.7.5. EIS Submissions

Upon its completion, the EIS is made publicly available for a period to be determined by the NT EPA depending on its complexity, during which stakeholders and the public can review the document and submit comments on the quality of the proponent's assessment and commitments. This provides certainty for all that the Proponent has identified significant risks and impacts and reasonable and practicable measures have been proposed to protect the environment.

Public notices are utilised to advertise the start of the public review periods for both the ToR and the EIS. Public notices are placed on the Northern Territory Environment Protection Authority's website and in relevant publicly available publications i.e. newspapers. Key stakeholders are also notified by mail, including those who hold land on, or adjacent to, a proposed tenure; a registered native title body corporate or claimant; a representative Aboriginal or Torres Strait Islander body; and relevant local government authorities.

The EIS is placed on public display at nominated Northern Territory offices in Darwin and Alice Springs, relevant local libraries and community centres, the KGL site office, and the KGL corporate office in Brisbane.

An electronic copy of the EIS is available for download from the KGL Resources website:

<https://www.kglresources.com.au/projects/2-jervois-base-metal/4-project-overview>

EIS submissions are invited by the NT EPA via e-mail or post to:

eia.ntepa@nt.gov.au

Environmental Assessments

NT Environment Protection Authority

GPO Box 3675

Darwin NT 0801

Submissions are considered as public documents and will be provided to KGL to prepare a response for the inclusion in subsequent processes associated with the EIS.

1.7.6. Public Consultation Process

The public consultation program for the Project, which included consultation with stakeholders, has been delivered by the EIS project team and KGL. A list of the stakeholders is provided in the Social Impact Assessment Report as attached in Appendix C-9.

The key component of public consultation program involved:

- Communication with key stakeholders about the Project and the EIS process
- Public consultation on the draft ToR, advising of its purpose, location and requirements
- Identifying stakeholder concerns that related to the Project and ensuring, where relevant, that these were included in the EIS process; and
- Social baseline studies aimed at capturing the values most important to the community.

Further information on the consultation methodology along with the results and feedback received to date is provided in the Social Impact Assessment Report attached as Appendix C-9.

The broad issues of concern to the local community and relevant community groups are discussed in Section 4.7 Social, economic and cultural surrounds.

1.7.7. Project Approvals

The agreements, approvals that have been obtained and additional approvals which may be required for the Project are provided below. A description of the key legislation, guidelines and standards applicable to the Project is provided in Appendix C-13. A description of the monitoring, enforcement and review procedures required are provided throughout the relevant sections and sub-plans of the Environmental Management Plan in Section 5.

1.7.7.2 Commonwealth Legislation

Environment Protection and Biodiversity Conservation Act 1999

In accordance with the EPBC Act, the Project was self-assessed for impacts to MNES and referred to the Federal Department of Environment in November 2013. In February 2014 the Notification of Referral Decision declared that the Project was not a Controlled Action as no MNES were deemed likely to be impacted by the project and therefore does not require Federal involvement in the impact assessment process.

Numerous flora and fauna field surveys have been conducted across the Project dating back to 1999. Despite targeted survey effort, no species of conservation significance listed under the EPBC Act were recorded in the Project area.

Aboriginal Land Rights (Northern Territory) Act 1976

Under the ALRA, four Land Councils have been established in the Northern Territory with the Central Land Council being responsible for land within the Jervois Project. An Indigenous Land Use Agreement (ILUA) with the traditional owners and the Central Land Council has been completed and registered with the National Native Title Tribunal (NNTT). KGL will continue to work with the Central Land Council in their protection and support of the local Aboriginal community.

Aboriginal and Torres Strait Islander Heritage Protection Act 1984

At this time KGL is not aware of any places within the Project area that are subject to any declarations under this legislation. Should anything be discovered that KGL believe may be Aboriginal or Torres Strait Islander in nature, it will be reported to the Minister as required.

Australian Heritage Council Act 2003

Places on the National Heritage List or the Commonwealth List have protection provisions when actions may have significant impacts on values or places. There are no currently listed places within or immediately surrounding the Jervois Project.

National Greenhouse and Energy Reporting Act 2007

The GHG assessment estimated emissions for the Project and it is expected to trigger the NGER reporting threshold which requires reporting for a single facility of 25 kilotonnes CO₂-e (25,000 tonnes CO₂-e) of greenhouse gases and 100,000 MJ of energy consumed. The Project predictions of 71,854 of Total CO₂-e (tonnes) per annum is above the 25,000 CO₂-e (tonnes) limit prescribed by NGER.

Native Title Act 1993

As required by the NT Act, an Indigenous Land Use Agreement (ILUA) with the traditional owners and the Central Land Council has been negotiated and registered with the National Native Title Tribunal (NNTT).

Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Act 2016

Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Act 2016 makes provision for safety in the transport of dangerous goods by road and rail. The project will be involved in the transportation of dangerous goods by road or rail in the following manner: loading and

unloading of dangerous goods and transportation of dangerous goods on Project site. Given that concentrate produced is classified as Class 9 Dangerous good, drivers handling and transporting such materials will be required to hold a Dangerous Good Driver's Licence. A Dangerous Good Vehicle Licence will also be required for the vehicles.

1.7.7.2 Northern Territory Legislation

Bushfires Management Act 2016

The Project lies within the Alice Springs Fire Management Zone. Although it is not being considered at this time, should the Project need to undertake any controlled burns, the appropriate permit from Bushfires NT in Alice Springs.

Dangerous Goods Act 2012

The Project will be handling, storing and transporting dangerous goods throughout the life of the mine and where this is in the jurisdiction of the Project, the appropriate licences will be sought. The following licence and certificates will potentially be required:

- Storage of explosives Licence; and
- Shotfirer's certificate required for blasting explosives.

Further details on the handling, storage and transport of dangerous goods is included within the Environmental Management Plan in Section 5 of this EIS.

Environmental Assessment Act 1982 and Environmental Assessment Administrative Procedures 1984

As described in the Project Approvals Section 1.8.1, an NOI was submitted to the Northern Territory Department of Mines and Energy in November 2013 for a determination on the appropriate level of environmental assessment for the Project. In February 2014 the NT EPA advised that an EIS was required for the Jervois Project. A notice of an alteration to the Project under the EAAP to the original NOI was submitted to the NT Department of Primary Industries & Resources in January 2017 and a new ToR provided in August 2017. This EIS is being prepared in accordance with the ToR with the aim of obtaining ultimate approval for the Project which will include conditions for managing potential environmental impacts.

Heritage Act 2011

The archaeological sites recorded in the 2018 survey were reported as being unlikely to satisfy any of the heritage significance criteria under the Heritage Act as they were considered to be unlikely to add to the knowledge of past Aboriginal land uses, mobility patterns or resource procurement strategies. Where possible, the recorded sites will be avoided or if this is not feasible, an application under the NT *Heritage Act* will be lodged.

Mineral Titles Act 2011

The Project is located within Exploration Licence EL 25429 and several Mineral Leases which have been granted in will continue to be administered under the Mineral Titles act as detailed in Section 1.2.1.

Mining Management Act 2001

KGL have submitted numerous MMPs over the past several years for their exploration activities and will prepare and submit an MMP following completion of the formal EIA process. This MMP will include all the details as required by regulatory guidelines and the *Mining Management Act*. Should the MMP require amendments throughout the life of the Project, these will be submitted to the Minister for approval as required. In addition, appropriate security will be provided in accordance with Section 43 of the *Mining Management Act*.

Northern Territory Aboriginal Sacred Sites Act 1989

In August 2016 an AAPA Authority Certificate was issued for EL25429 for ‘all operations, activities and incidental matters’ of the ILUA between CLC and KGL. This Authority Certificate states that no works can be undertaken and no damage shall occur within the nominated Restricted Works Area. An additional Authority Certificate has been issued for activities associated with the development of the Project in areas adjacent to EL25429.

Northern Territory Environment Protection Authority Act 2012

As described above and in Section 1.7.1, the NT EPA determined this Project required formal assessment through the preparation of an EIS and issued a ToR to enable them to assess the potential impacts of the proposed Project with the aim of protecting the environment and promoting ecologically sustainable development.

Public and Environmental Health Act

As the Project will have sewage and some waste water treatment systems associated with the accommodation village, crib facilities and the processing plant, these will require compliance with and approvals under the *Public and Environmental Health Act* and Regulations. All approvals required by the Department of Health under this legislation will be sought where applicable.

Territory Parks and Wildlife Conservation Act 2000

Flora and fauna species listed under the TPWC Act will be protected from impacts and managed in accordance with the Biodiversity Management Plan provided in Section 5 of this EIS. The aim of this BMP is to manage threatened species in a manner that “maintains or increases their population or the extent of their distribution at or to a sustainable level”.

Weeds Management Act 2001

The Project area contained two declared weed species *Tamarix aphylla* (athel pine) and *Cylindropuntia fulgida* var. *mamillata* (coral cactus) but was generally considered to be in good condition considering the long history (since 1929) of mining and the presence of some existing mining infrastructure. In accordance with this legislation declared weed species will be managed in accordance with the Environmental Management Plan. This Plan nominates performance indicators, management actions, monitoring and reporting requirements to prevent the spread of weeds.

Work Health and Safety (National Uniform Legislation) Act

In accordance with this Act, a Risk Management Plan which outlines the Projects occupational health and safety aspects will be submitted to NT Worksafe. This Plan will provide measures which aim to reduce the risk of impacts to human health and safety on the Project and will be certified in accordance with Part 10.3 of the Work Health and Safety (National Uniform Legislation) Regulations. Should any health and safety incidents occur on site, these will be reported to NT Worksafe.

Hazardous chemicals will be stored and handled in a manner which complies with the WHS Regulation. A register of hazardous chemicals and their associated Material Safety Data Sheets (MSDS) will be maintained on site. Should the quantity of hazardous chemicals stored on the Project meet the thresholds detailed in the WHS Regulation, these will be notified to NT Worksafe and licensed as a Major Hazard Facility.