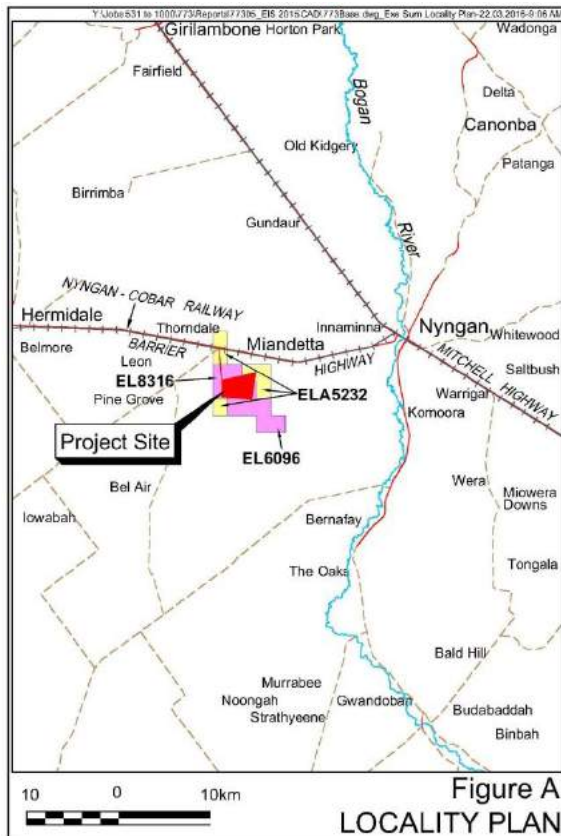


Executive Summary

INTRODUCTION

This *Environmental Impact Statement* (EIS) has been prepared by R.W. Corkery & Co. Pty. Limited on behalf of EMC Metals Australia Pty Ltd (the Applicant) to support an application for development consent for the Nyngan Scandium Project (the Proposal), located approximately 20km west-southwest of Nyngan in Western NSW (Figure A).



The Proposal would comprise construction and use of the following.

- Two open cuts within a surrounding borrow pit with extraction of up to 80 000t per annum (tpa) of high grade ore and up to 95 000tpa of low grade ore over a period of 21 years.

- A Processing Plant.
- A Residue Storage Facility.
- Ancillary infrastructure, including but not limited to, a site access road, evaporation pond, levee bunds, water and power supply infrastructure etc.

The Proposal is classified as State Significant Development in accordance with Paragraph 5 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* (State and Regional Development SEPP) as it would have a capital investment value of more than \$30 million.

Approval is required in accordance with Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The approval authority is the Minister for Planning and Environment or their delegate.

THE APPLICANT

The Applicant, EMC Metals Australia Pty Ltd, is a subsidiary of the Canadian-incorporated Scandium International Mining Corp. (SCY). SCY is a specialty metals mining group with a worldwide exploration and development focus on scandium projects and market development, as well as opportunistic development of select specialty metals and rare earth elements that may accompany scandium resources. SCY's primary operational focus is on its scandium project holdings, specifically the Nyngan Scandium Project and the Honeybugle property in Australia and the Tordal scandium property in Norway.

The Proposal is 100% owned and operated by the Applicant.

OBJECTIVES OF THE PROPOSAL

The Applicant's objectives in constructing and operating the Proposal include the following.

- To mine the identified scandium reserves in a safe and environmentally responsible manner.
- To maximise the recovery of the identified scandium reserves through efficient mining and processing operations.
- To minimise the consumption of water, power and chemical reagents.
- To operate the Proposal in a manner that would minimise surface disturbance and impacts on surrounding residents and the local environment.
- To develop and operate the Proposal in compliance with all relevant statutory requirements.
- To create a final landform that is suitable for a post-mining land use that would include a mixture of agriculture, nature conservation and water storage.
- To achieve the above objectives in a cost-effective manner to ensure security of employment and the continued economic viability of the Applicant.

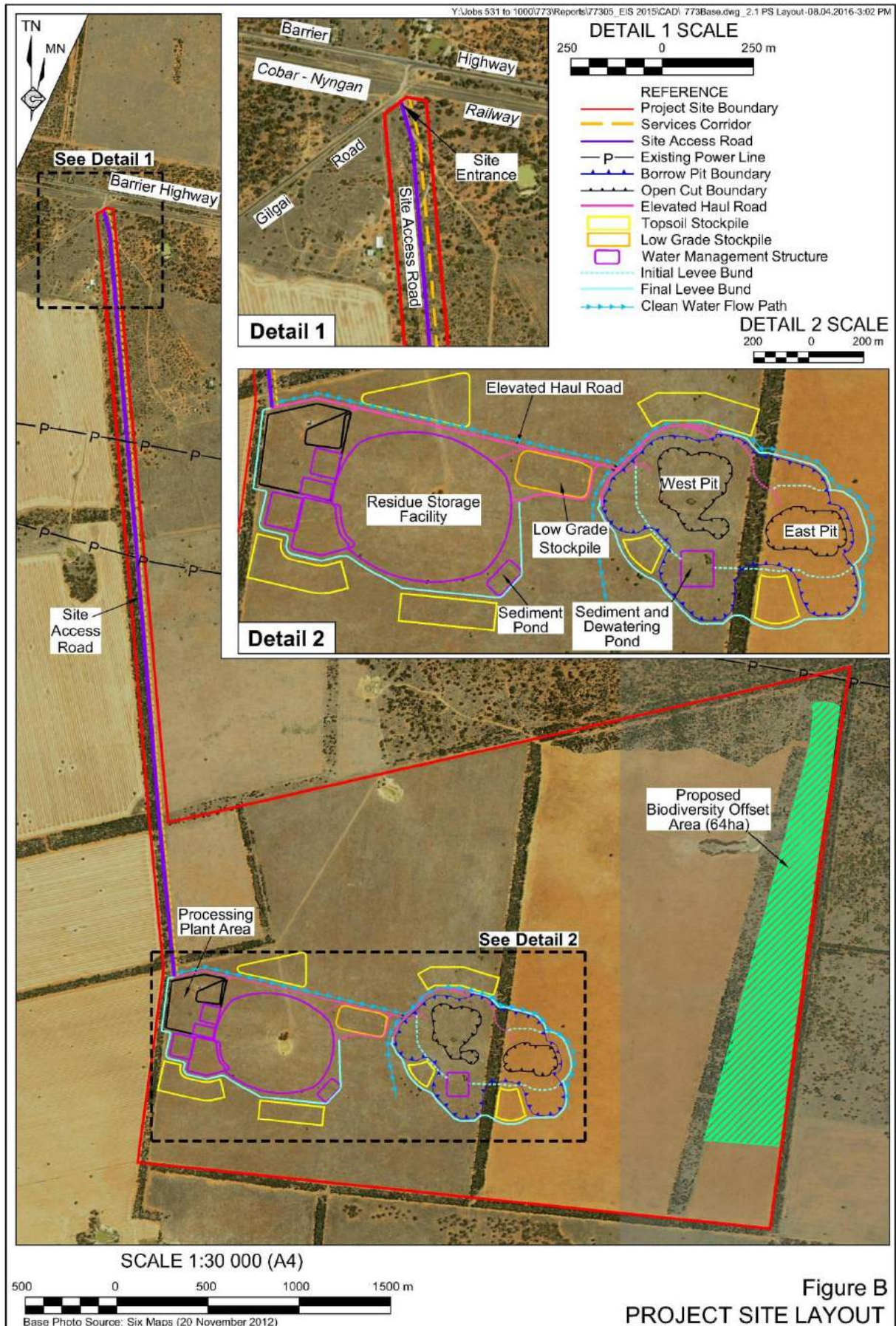
DESCRIPTION OF THE PROPOSAL

Overview

The Proposal would comprise the following (**Figure B**).

- Establishment of infrastructure required for the Proposal, including a Site Access Road, power and water supply, levee bunds and administration area.

- Extraction of overburden and ore material from two open cuts and a surrounding borrow pit using conventional free dig mining methods on a campaign basis. Annual ore production would be up to 80 000t of high grade ore, and up to 95 000t of low grade ore. Mining would be undertaken for a period of up to 21 years.
- Use of extracted overburden for the construction of site infrastructure, including the Residue Storage Facility, levee bunds, haul roads and water management structures.
- Construction and use of a Processing Plant, which would incorporate a run-of-mine (ROM) Pad, feed preparation circuit, high pressure acid leach plant and associated infrastructure, including boilers, reagent and consumable stores, as well as residue management systems to produce up to approximately 45t per year of scandium oxide. The scandium oxide would be transported from the Project Site in sealed containers with an indicative capacity of less than 100L. Processing would be undertaken for the life of the mining operations, namely 21 years.
- Construction and use of a Residue Storage Facility.
- Construction and use of water management structures, including a Raw Water Pond, Event Pond, External Decant Pond, Evaporation Pond and a number of Sediment Ponds.
- Construction and use of a transformer and electrical distribution network.
- Construction of soil stockpiles (for use in rehabilitation works).
- Establishment of a Biodiversity Offset Area.



Site Preparation

The following activities would be undertaken in preparation for mining operations and the construction of the Processing Plant and other infrastructure.

- Survey, mark out and fencing of disturbance areas.
- Construction of the Site Access Road, internal roads and intersection of the Site Access Road and Gilgai Road.
- Construction of the Processing Plant, workshops, offices and associated infrastructure, including a high voltage electricity line and water supply pipeline.
- Removal of vegetation and stripping of soil.

Mining Operations

Ore and overburden would be extracted from two open cuts and a borrow pit as follows.

- Total area38.2ha.
- Depth
 - East Pit 45mbgl.
 - West Pit..... 50mbgl.
 - Borrow Pit..... 15mbgl.

Following removal of vegetation and soil material, mining operations would commence with the removal of overburden using a front-end loader and bulldozer.

Open cut mining operations would then remove ore material in thin layers using a front-end loader or excavator. Annual ore production would be up to 80 000t of high grade ore and 95 000t of low grade ore for a period of 21 years.

The Applicant does not anticipate that drill and blast extraction methods will be required.

Processing Operations

Ore material would be processed within the on-site Processing Plant, which would include the following components.

- A ROM Pad for stockpiling and blending of ore.
- A Feed Preparation Circuit for physical preparation of ore material.
- A Leach Preparation Circuit for preheating and preparation of the ore slurry.
- A High Pressure Acid Leach Circuit where the contained scandium would be transferred from the ore to the leach solution.
- A Counter Current Decant Circuit where the scandium-bearing leach solution would be removed from the ore slurry.
- A Solvent Extraction Circuit where the leached scandium in solution would be transferred to an organic solvent.
- A Scandium Oxide Precipitation Circuit where the scandium would be precipitated from the organic solvent and converted to scandium oxide.
- A Residue Preparation Circuit where the residue or tailings would be neutralised and thickened prior to being transferred to the Residue Storage Facility.

The anticipated annual production would be approximately 45t of scandium oxide per year.

The Processing Plant would also include a range of ancillary infrastructure, including the following

- Reagent stores.
- An LPG-fired boiler.
- A cooling tower.
- A reverse osmosis plant.

- Water management structure.
- Workshops.
- Administration offices.

Residue Management

Residue would be pumped to the Residue Storage Facility, where the solid and liquid fractions would then be permitted to separate. The liquid fraction would be pumped to the External Decant Pond for reuse within the Processing Plant.

The Residue Storage Facility would be an engineered, lined facility that would comply with the design criteria of the Dams Safety Committee of NSW and the Environment Protection Authority's *Draft Environmental Guidelines: Solid Waste Landfills*.

Water Management

The Applicant would source required operational water from the existing Nyngan to Cobar Pipeline. That water would be subject of the relevant Water Access Licence and would be supplied under a commercial arrangement with the Cobar Water Board.

Levee bunds would be constructed around the proposed areas of disturbance, with the crest of the bund approximately 1m high above the modelled height of a 0.1% (1 in 1 000 year) Annual Exceedance Probability storm event.

A range of water management structures would be constructed within the bunded areas to ensure appropriate separation of clean, dirty and contaminated water. No surface water would be discharged from the Project Site.

Transportation Operations

The Project Site would be accessed via the Barrier Highway and Gilgai Road, with the vast majority of vehicles accessing the Project Site from the east.

An assessment of the intersection between the Barrier Highway and Gilgai Road determined that the sight distance from the intersection along the Barrier Highway is 560m to the east and 200m to the west.

The Applicant would construct an intersection between Gilgai Road and the Site Access Road in accordance with *Austrroads Guide to Road Design – Part 4A: Un-signalised and Signalised Intersections* to the satisfaction of Bogan Shire Council.

Finally, the Applicant anticipates that the Proposal would result in up to 60 light vehicle movements (30 return trips) per day and 10 heavy vehicle movements (5 return trips) per day.

Hours of Operation

The Applicant would undertake mining operations on a campaign basis approximately 3 times per year. Mining would typically be undertaken 7 days per week between 6:00am and 6:00pm, with a period before and after those times.

Processing operations would be undertaken 24-hours per day, 7 days per week.

Life of the Proposal

The Applicant proposes to undertake mining operations for a period of 21 years, with a period prior to mining operations commencing for financing and construction operations and following mining operations for rehabilitation and mine closure operations. As a result, development consent is sought for a period of 26 years.

Employment and Economic Contribution

The Applicant anticipates that it would require the following full time equivalent (FTE) personnel to operate the Proposal.

- Construction – Approximately 60 FTE positions.
- Ongoing operations – Approximately 75 FTE positions

Additional employment would also be generated for contract campaign mining operations, contract truck drivers and service providers.

The Applicant anticipates that the Proposal would contribute approximately \$12.4 million per year to the local and regional economy, and approximately \$39.0 million per year to the State and national economies.

Final Landform and Land Use

The final landform would comprise the following.

- Two bunded and fenced open cuts within a revegetated borrow pit with side slopes of 1:3 (V:H) or less.
- A free draining, covered and revegetated Residue Storage Facility.
- A shaped, covered and revegetated Low Grade Stockpile with slide slopes of 1:3 (V:H) or less
- A generally flat Processing Plant Area with all infrastructure not required for the final land use, including the levee bunds, removed.
- Two water storage dams, namely the Event Pond and Sediment Pond, with all other water storages removed.

The Site Access Road would remain for the final land use. Infrastructure within the services corridor not required for the final land use would be removed.

The proposed final land uses for the Project Site would include agriculture, nature conservation and water storage.

PLANNING CONTEXT

Planning Instruments

The Project Site is situated within land zoned as RU1 – Primary Production under the *Bogan Local Environmental Plan 2011* (Bogan LEP). Open-cut mining is identified as permissible with consent within this zone.

The Proposal would be developed and operated in accordance with a number of State planning instruments, namely:

- SEPP (State and Regional Development) 2011;
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007;
- SEPP (Infrastructure) 2007; and
- SEPP 33 (Hazardous and Offensive Development).

The EIS addresses each of the above documents together with the Bogan LEP.

Approvals Required

In addition to development consent, the Applicant anticipates the following approvals, licences and leases would be required.

- An Environment Protection Licence issued under the *Protection of the Environment Operations Act 1997*.
- A Mining Lease issued under the *Mining Act 1992*.
- Water Supply Works and Use Approval and Water Access Licence issued under the *Water Management Act 2000*.

- A Section 138 Permit issued by the Bogan Shire Council under the *Roads Act 1993*, for construction of the intersection of the Site Access Road and Gilgai Road.
- An approval from the NSW Dams Safety Committee for the design and construction of the Residue Storage Facility.
- A high voltage connection agreement with Essential Energy under the *Electricity Supply Act 1995*.

ENVIRONMENTAL FEATURES SAFEGUARDS AND IMPACTS

The components and features of the existing environment within and surrounding the Project Site have been studied in detail and the Proposal has been designed to avoid or minimise impacts on that environment. A brief overview of the main components of the surrounding environment, the proposed safeguards and the assessed level of impact are set out in the following sections.

Air Quality

Ramboll Environ determined that the Proposal would not result in an exceedance of the relevant deposited or suspended particulate matter assessment criteria at any surrounding residences as a result of the Proposal. In addition, the Proposal would not result in significant greenhouse gas impacts. Furthermore, taking into consideration the Applicant's commitment to install a range of emission control devices to ensure compliance with the Clean Air Regulation, Ramboll Environ determined that the Proposal would not result in adverse air quality impacts associated with the proposed processing operations.

Ecology

The Proposal would result in the disturbance of approximately 9.3ha of Poplar Box – Gum-barked Coolibah – White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion vegetation community. EnviroKey undertook an assessment of the impacts associated with the disturbance of this vegetation, and determined that the Proposal would not have a significant impact upon this community, as it is well represented in the immediate area.

EnviroKey further identified that:

- five species listed under the *Threatened Species Conservation Act 1995* have the potential to occur within the Project Site; and
- one protected species listed under the *Environment Protection and Biodiversity Conservation Act 1999* has the potential to occur within the Project Site.

EnviroKey undertook significance assessments for each of the observed species or those with potential to occur and determined that, with the implementation of management and mitigation measures, the Proposal would be unlikely to have a significant impact on any identified species.

The Applicant would implement a Biodiversity Offset Strategy to offset vegetation clearing impacts, including a proposed 64ha Biodiversity Offset Area (**Figure B**). EnviroKey concluded that the proposed Biodiversity Offset Strategy would be consistent with the Office of Environment and Heritage's offsetting principles.

Surface Water

Knight Piésold undertook an assessment of the hydrology of the Project Site and surrounds. In particular, the assessment focused on the potential for flooding

associated with Whitbarrow Creek, located to the south of the Project Site. The assessment considered both a 1% (1 in 100 year) and 0.1% (1 in 1 000 year) Annual Exceedance Probability (AEP) Storm.

Knight Piésold determined that the maximum flood height for a 0.1% AEP event in the vicinity of the Processing Plant/Residue Storage Facility Area and the open cuts would be approximately 185.2m AHD and 184.5m AHD respectively. As a result; the Applicant proposes to construct levee bunds around the Processing Plant/Residue Storage Facility Area and open cuts of 186.6m AHD and 185.6m AHD respectively, or more than 1m higher than the anticipated 0.1% AEP flood level.

The levee bunds would exclude all surface water from the proposed disturbance areas and retain all potentially dirty or contaminated water within the bunded area. As a result, no adverse surface water impacts are anticipated.

Groundwater

Ground Doctor determined that the groundwater within the Project Site would not be suitable for any common beneficial use without prior treatment due to high salinity. Impax also determined that the Proposal is not anticipated to result in groundwater drawdown at any surrounding groundwater bores or drainage lines.

Noise

Operational and transport noise generated by the Proposal would, assuming the implementation of the nominated safeguards and controls, not exceed the relevant criteria at any privately-owned residence.

Traffic and Transportation

The Site Access Road, the intersection of the Site Access Road and Gilgai Road, and the intersection of Gilgai Road and the Barrier Highway would be upgraded to accommodate Project-related heavy vehicle movements. As a result, the Proposal would not result in additional adverse traffic-related impacts.

Aboriginal and Historic Heritage

No sites of Aboriginal heritage significance were identified within the Project Site. One site of potential historic heritage significance was identified but would not be disturbed by the Proposal.

Visual Amenity

Based on the relative isolation of the Project Site and the proposed landscape and visual amenity related controls, the Proposal would not impact significantly on local visual amenity.

Soils and Land Capability

Given the establishment of soil management procedures and safeguards, the Proposal would not result in significant soil and land capability impacts.

PROPOSAL EVALUATION AND JUSTIFICATION

The Nyngan Scandium Project has been evaluated and justified principally through consideration of its potential impacts on the environment and potential benefits to the local and wider community.

An evaluation of the Proposal has been undertaken by firstly re-assessing the risks posed to the local environment by Proposal-related activities following the implementation of all operational controls, safeguards and/or mitigation measures, and

secondly through consideration of the principles of ecologically sustainable development.

This evaluation has found that, with the implementation of the proposed operational controls, safeguards and/or mitigation measures, the residual risk posed by each potential environmental impact has been reduced to either moderate, low, or as low as reasonably practicable, and therefore acceptable.

Further, the design of the Proposal has addressed each of the sustainable development principles, and on balance, it is concluded that the Proposal achieves a sustainable outcome for the local and wider environment.

The Proposal and associated activities have been assessed in terms of a wide range of biophysical, social and economic issues. Potential residual impacts can be justified in terms of the positive economic and social benefits to the local surrounding towns, villages and regional centres and the Bogan and surrounding Local Government Areas.

CONCLUSION

The Proposal has, to the extent feasible, been designed to address all issues raised by the local community and all levels of government, as well as the principles of ecologically sustainable development. The Proposal provides for the extraction of a valuable State-owned resource that would facilitate the development of new and innovative products, including wider use of aluminium – scandium alloys and fuel cells.

The Proposal would also result in the creation of local employment and expenditure within the regional economy. The socio-economic impacts of the Proposal are considered to be positive.

Finally, the post-mining landform would result in the continuation of the existing land use, namely agriculture, as well as providing areas for nature conservation and water storage.

In light of the conclusions included throughout this *Environmental Impact Statement*, it is assessed that the Proposal could be constructed and operated in a manner that would satisfy all relevant statutory goals and criteria, environmental objectives and reasonable community expectations.

Project Summary

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Project Component	Summary of the Proposal
Mining Method	Open cut mining using free dig techniques within two open cuts and a borrow pit with a combined area of 38.2ha and a maximum depth of approximately 50mbgl. Mining would be undertaken on a campaign basis approximately three times per year.
Resource	Measures and indicated – 12Mt at 261ppm scandium.
Disturbance Area	Approximately 145ha, comprising: <ul style="list-style-type: none"> • 9.3ha of Benson ID 103 – Poplar Box – Gum Coolabah and White Cypress Pine Shrubby Woodland mainly in the Cobar Penneplain Bioregion; and • 135.7ha of exotic vegetation.
Annual Ore Production	Up to approximately 80 000tpa of high grade ore and 95 000tpa of low grade ore.
Mine Life	Approximately 21 years for mining operations, with an additional 2 years for financing and construction and 2 to 3 years for rehabilitation for a total Proposal life of 26 years.
Total Resource Recovered	Approximately 1.5Mt.
Processing	Scandium would be extracted using high pressure acid leach and solvent extraction to produce up to 45t of scandium oxide per year.
Management of Overburden	Overburden would be used to construct site infrastructure, including the Residue Storage Facility, levee bunds and water storages.
General Infrastructure (see Figure B)	General infrastructure would include the following. <ul style="list-style-type: none"> • Site Access Road and intersection with Gilgai Road. • Two open cuts and a borrow pit. • A Processing Plant Area incorporating the proposed Processing Plant, reagent storage areas, water storages and hardstand areas. • A Residue Storage Facility. • Internal roads, including an elevated haul road. • Electricity supply and distribution network. • Ancillary infrastructure, including offices, workshops, hydrocarbon stores, ablation and waste water treatment facilities and hardstand areas.
Product Transport	Scandium oxide would be transported from the Project Site in small containers with an indicative capacity of less than 100L.
Water Management	Operational water – sourced from the Nyngan – Cobar Pipeline under licence. Potentially contaminated and sediment-laden water – retained on-site. External flood water – excluded by levee bund with a crest approximately 1m higher than the modelled 0.1% (1 in 1 000 years) storm event.
Workforce	Approximately 60 personnel during construction and 75 during operation.

Project Summary (Cont'd)

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Project Component	Summary of the Proposal
Hours of Operation	Land preparation and rehabilitation – daylight hours, 7 days per week. Mining – 6:00am to 6:00pm, 7 days per week. All other activities – 24-hours per day, 7 days per week.
Capital Investment Value	Approximately A\$124.4 million.
Final landform / land use	Open cuts – final void / water storage. Borrow Pit and Low Grade Stockpile – nature conservation (woodland). Residue Storage Facility – free draining landform / nature conservation (grassland). Event and Sedimentation Ponds – water storage. Remaining disturbed areas – consistent with current landform / agriculture.

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