STATE SIGNIFICANT DEVELOPMENT ASSESSMENT
Nyngan Scandium Project (SSD 5157)




Assessment Report
Section 89E of the
Environmental Planning and Assessment Act 1979
November 2016

Cover Photographs: (clockwise from top left) landscape view of project site (source: original photo from site visit), solid oxide fuel cells, the intersection of the Barrier Highway and Gilgai Road, a high speed train incorporating scandium aluminium alloy (source: Nyngan Scandium Project, EIS, May 2006).

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EXECUTIVE SUMMARY

EMC Metals Australia Pty Ltd (EMC) proposes to develop a new scandium mine approximately 20 kilometres southwest of Nyngan in the Bogan local government area, in western NSW.

Scandium is a high value metal typically sold and consumed as scandium oxide. The market demand for scandium has grown substantially in recent years, however it is currently limited by a low and expensive supply.

The project, which is known as the Nyngan Scandium Project, involves the development of a new open cut scandium mine to extract a total of 1.5 million tonnes of ore from two adjacent open cut pits. Mining would be undertaken on a campaign basis up to three times a year with each campaign lasting between three to five weeks. A maximum of 175,000 tonnes of ore would be processed each year to produce a total of 45 tonnes of scandium oxide.

The project is declared to be State Significant Development (SSD) and the Minister for Planning is the consent authority for the development under the *Environmental Planning and Assessment Act 1979*. However, under the Minister's delegation of 16 February 2015, the Executive Director, Resource Assessments and Business Systems, may determine the development application.

The Department publicly exhibited the environmental impact statement for the project from 25 May 2016 until 24 June 2016, and received six submissions from public authorities. None of the public authorities objected to the project. However, some agencies raised concerns, which have been resolved. No submissions were received from surrounding landowners or members of the general public.

The Department has assessed the development application, EIS, submissions, RTS and additional information provided by EMC in accordance with the requirements of the EP&A Act.

The 'campaign-style' nature of the proposed mining operations, coupled with the surrounding environmental context which is primarily agricultural, with very few rural residential dwellings surrounding the site, means the potential environmental risks of the project are low.

The Department's assessment of the project identified the following key issues:

- Traffic – with the addition of project-related vehicles to the road network, the required level of safety at the existing intersection of the Barrier Highway and Gilgai Road would not be achieved. There are two feasible road upgrade options to resolve this issue, and the Department requires EMC to complete detailed design work in consultation with the Roads and Maritime Services to determine the best option.
- Tailings management – technology constraints currently prevent EMC from backfilling the final voids with tailings. Trials to increase the density of tailings material would be undertaken following commencement of mining, which if successful may reduce the size of the Residue Storage Facility and final voids. The Department requires EMC to carry out these trials, and prepare an updated Tailings Management Strategy in consultation with the Division of Resources and Energy, within five years of commencement of development.
- Workforce accommodation – the project may put pressure on the local housing market due to the increase of employees requiring housing in the area. To ensure there would be sufficient accommodation for mine employees, the Department requires EMC to develop an Accommodation Strategy in consultation with Bogan Shire Council, including options for minimising any adverse impacts on the Nyngan housing market.

Based on its assessment, the Department is satisfied that EMC has designed the project in a manner that achieves a reasonable balance between maximising the efficiency of the resource extraction and minimising the potential impacts on surrounding land users and the environment.

The project would also provide associated flow-on benefits to the local and regional communities through the generation of 60 construction jobs and 75 operational jobs, increased spending in the region with a capital expenditure of $124.4 million, $39 million a year in royalties to the State and national economies, and a Voluntary Planning Agreement with Council.

The Department has carefully weighed the impacts of the project against the benefits. On balance, the Department considers that the benefits of the project outweigh its costs, and that the project should be approved subject to stringent conditions.

1. PROPOSED PROJECT

1.1 Background

EMC Metals Australia Pty Ltd (EMC) proposes to develop a new scandium mine approximately 20 kilometres (km) southwest of Nyngan in the Bogan local government area, in western NSW (see **Figure 1**).

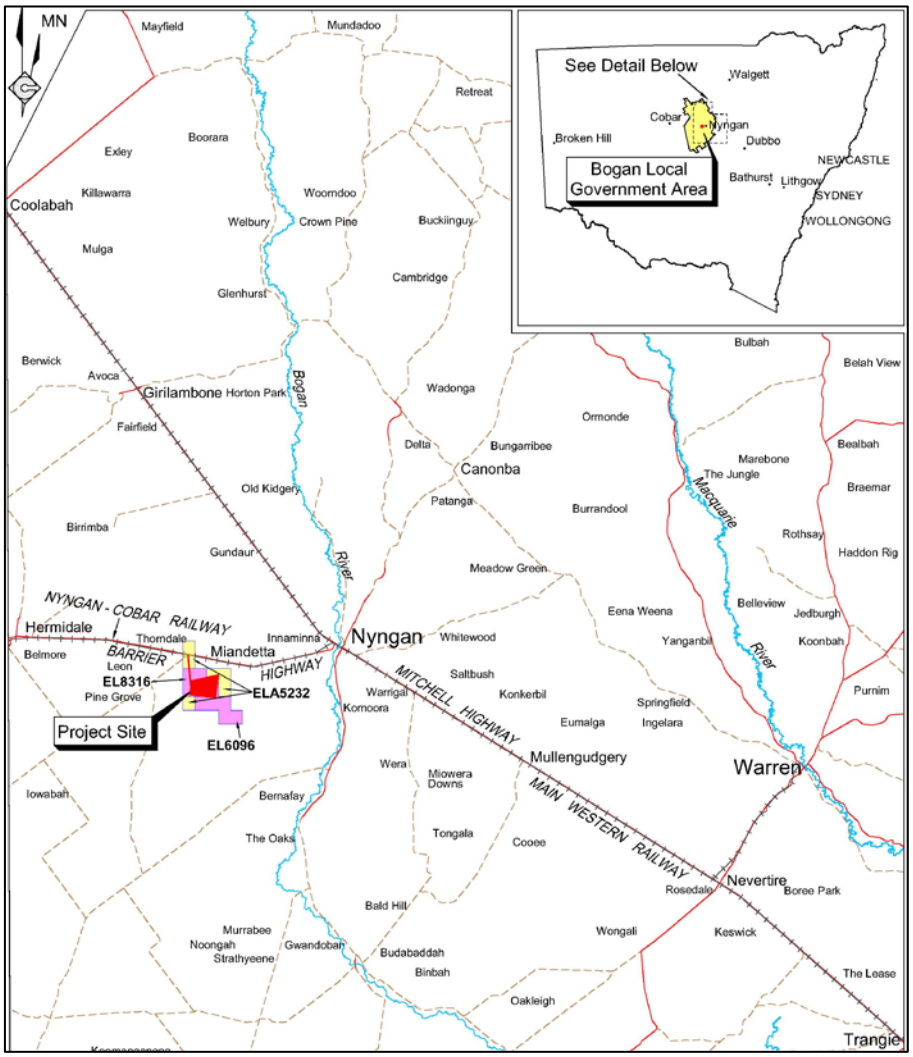

Figure 1: *Regional Location*

1.2 Project setting

The project, which is known as the Nyngan Scandium Project, would be located in an area characterised by vast, generally flat terrain, primarily used for agricultural purposes (see **Figure 5**). The main land uses within and surrounding the site include grazing and cropping.

The site covers an area of 910 hectares (ha), 145 ha of which would be directly disturbed by the project. Only small patches of remnant native vegetation exist within the site, largely along paddock fence lines. The project area is generally flat with a gentle slope towards Whitbarrow Creek, which is an ephemeral creek located about 500 metres (m) south of the area that flows into the Bogan River.

1.3 Project description

The project involves the development of a new open cut scandium mine to extract a total of 1.5 million tonnes (Mt) of ore from two adjacent open cut pits covering an area of approximately 10 ha. Mining would be undertaken on a campaign basis up to three times a year with each campaign lasting between three to five weeks. A maximum of 175,000 tonnes (t) of ore would be processed each year to produce a total of 45 t of scandium oxide, which would be transported via road from the site.

The project has been designed to ensure that all overburden material would be used to construct site infrastructure. To source enough overburden for construction of the residue storage facility and levee bunds, the project includes extraction of overburden from a 'borrow pit' of approximately 38 ha in area.

The key components of the project are summarised below **Table 1** and depicted in **Figures 2** to **4.** The project is described in detail in EMC's Environmental Impact Statement (EIS) which is attached as **Appendix A**.

Table 1: *Major Project Components*

Aspect	***Details***
Project summary	Development of a scandium mine, involving: • two separate open cut pits, identified as East Pit and West Pit, to access 1.5 Mt of ore; • constructing and operating a processing plant to process up to 175,000 t of ore a year for 21 years; • producing and transporting 45 t of scandium oxide a year from the mine via road; • developing associated infrastructure, including a borrow pit, residue storage facility, levee bunds, water management structures and access roads; and • progressively rehabilitating the site.
Project area	• Approximately 910 ha, including a 145 ha disturbance area.
Schedule	• Years 1 & 2 – construction and overburden extracted from East and West Pits. • Years 3 to 10 – mining to commence at West Pit and progress to East Pit. • Years 10 to 23 – continued mining at East and West Pits, and extraction of overburden from the borrow pit to a maximum depth of 15 m below ground level (bgl). • Years 24 to 26 – decommissioning and rehabilitation.
Mining methods	• Free dig mining methods (bulldozer and front end loader) to a depth of 50 m bgl.
Overburden	• 9.7 Mt of overburden (i.e. all available overburden) would be sourced from the open cut pits and the borrow pit and used to construct the residue storage facility, levee bunds, haul roads and water management structures. Overburden material is non-acid forming.
Processing	• Ore would be processed within the on-site processing plant, which includes a run-of-mine (ROM) pad to stockpile up to 20,000 t of ore.
Tailings	• Tailings slurry from the processing plant would be pumped to the residue storage facility for settling. The liquid fraction would be recycled for use in the processing plant. • 1.9 Mt of tailings would be produced over the life of the project. Trials to increase the density of tailings material would be undertaken following commencement of mining, which if successful may have implications on the final design of the project, particularly the Residue Storage Facility and final voids.
Ancillary Infrastructure	• Water management structures, including a raw water pond, event pond, external decant pond, evaporation pond and sediment ponds. • Water and power supply infrastructure, including a water pipeline connecting the site with the Nyngan to Cobar pipeline. • An access road and internal road network including an elevated haul road. • A workshop, office building, staff amenities and staff and visitor parking.
Transport	• Construction – a maximum of 38 light vehicle movements and 20 heavy vehicles movements a day (a movement is one vehicle entering and leaving the site). • Operations – a maximum of 30 light vehicle movements and 10 heavy vehicles movements a day. • All trucks would access the site via the Mitchell Highway, the Barrier Highway, Gilgai Road and the site access road.
Water supply	• A maximum of 223 mega litres (ML) a year of water required for processing (208 ML), dust suppression (13 ML) and potable water use (2 ML). • 170 ML of water would be sourced from the *Macquarie – Cudgegong Regulated Rivers Water Source*, and the remaining water would be sourced from on-site water structures.
Rehabilitation	• Proposed final land form would include grassland (28.6 ha), woodland (242.9 ha), water storages (1.5 ha), agricultural land (716 ha) and two final voids (10 ha).
Biodiversity Offsets	• 9.3 ha of native vegetation consisting *of Poplar Box-Gum Coolabag* and *White Cypress Pine Shrubby Woodland* would be cleared. • An 88.5 ha biodiversity offset area would be established to offset vegetation clearance.
Employment	• 60 construction employees, 75 operational employees and 10 contractors during mining campaigns.
Capital Investment Value	• $124.4 million.
Royalties	• $39 million a year.
Hours of operation	• Construction of the mine access road – standard construction hours. • Receipt and dispatch of heavy vehicles – 6 am to 6 pm, 7 days a week. • All other development – 24 hrs, 7 days a week.

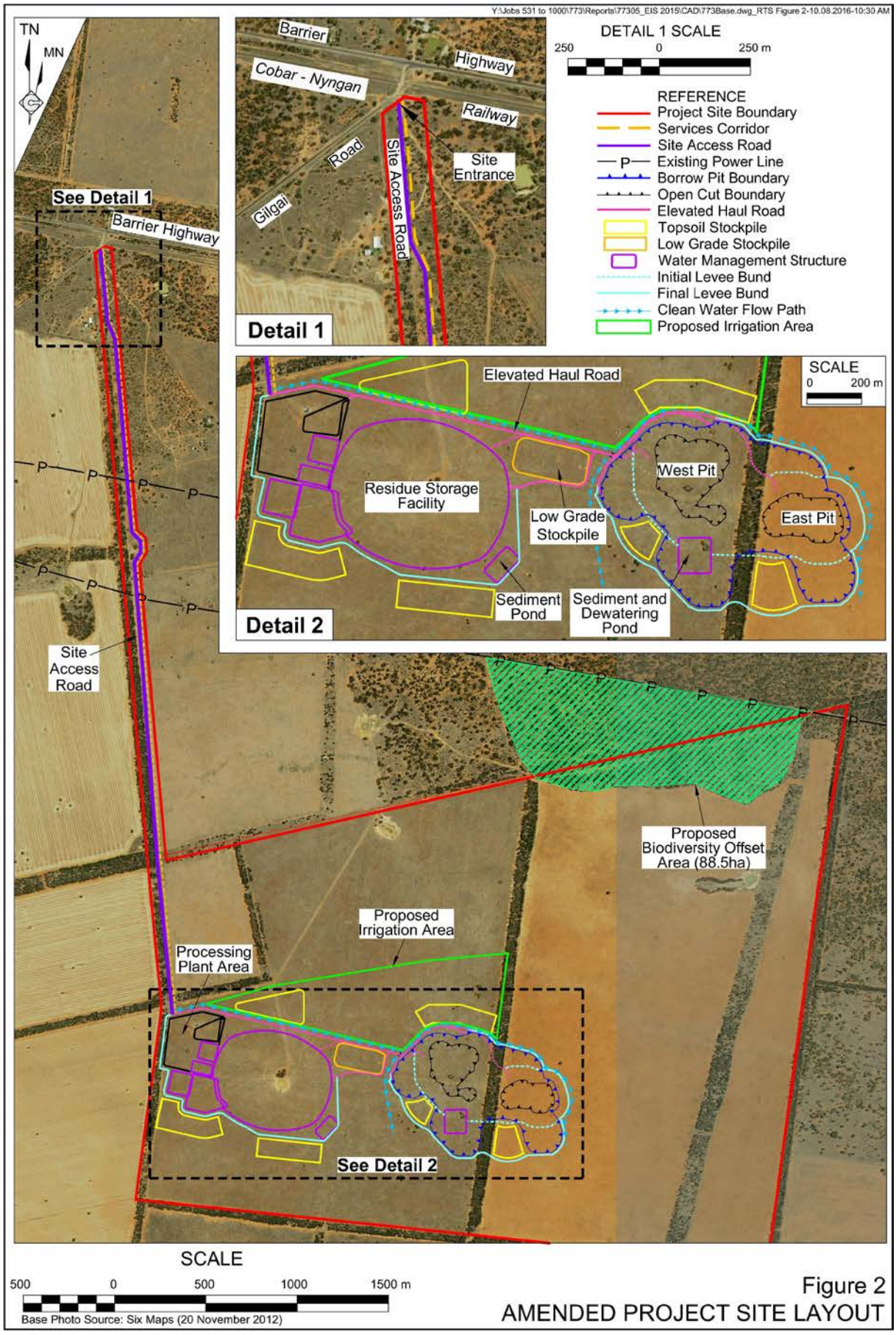

Figure 2: *Proposed Project*

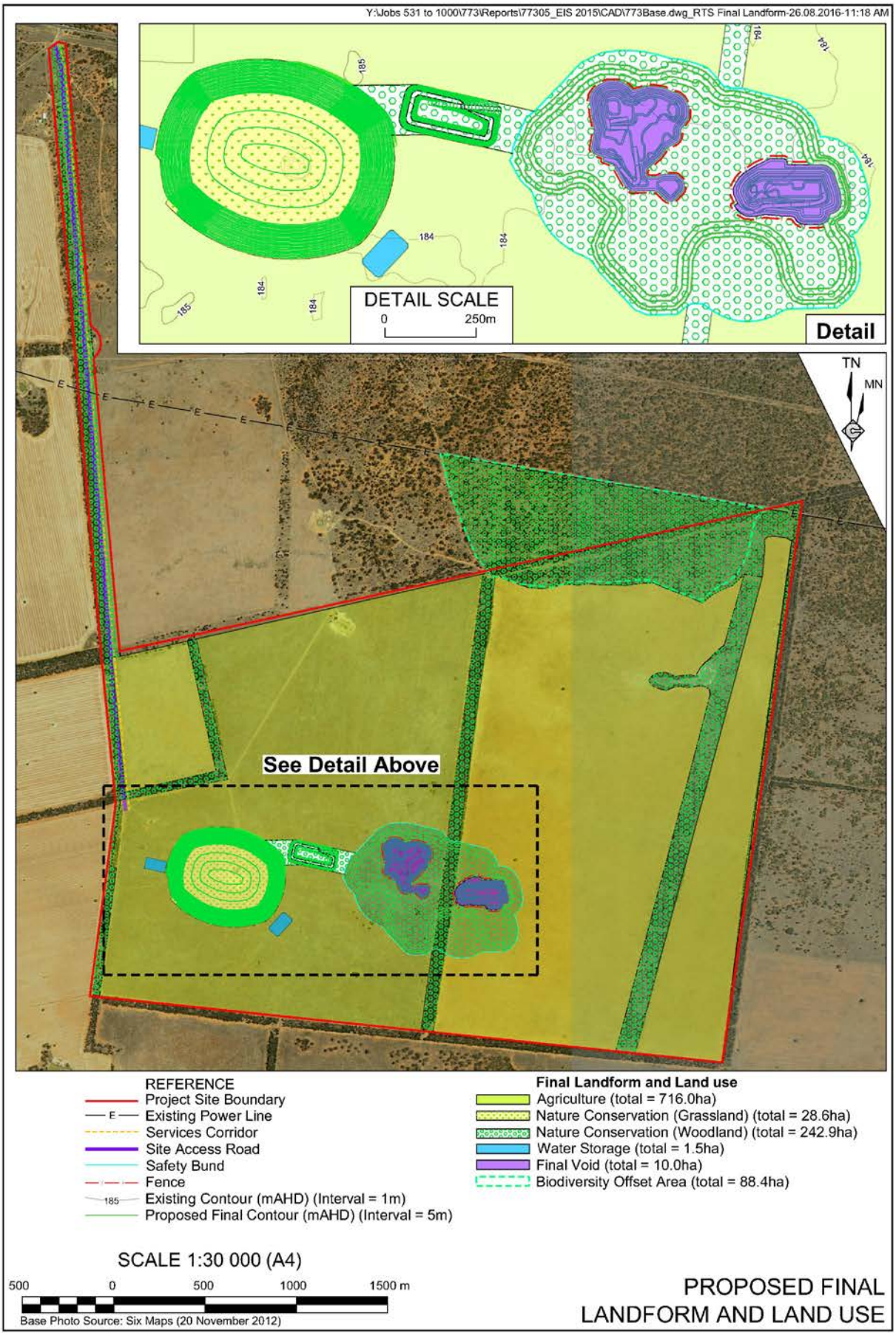

Figure 3: *Proposed Final Landform and Biodiversity Offset Area*

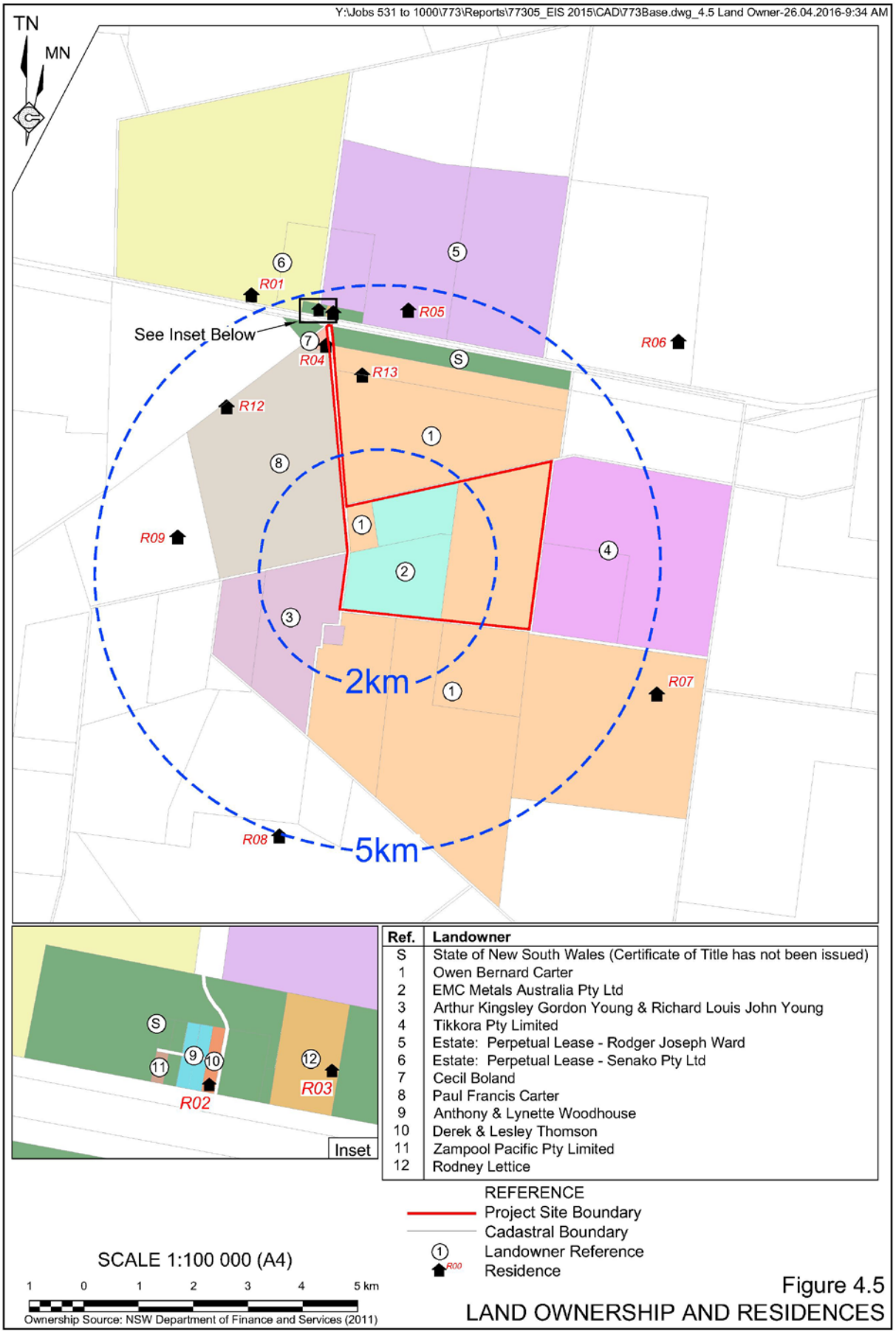

Figure 4: *Surrounding Receivers*

2. STRATEGIC CONTEXT

Scandium is a high value metal typically sold and consumed as scandium oxide. When added to certain aluminium alloys, scandium oxide increases the strength of the material and improves corrosion resistance and weldability. Given the benefits offered by this metal, scandium is increasingly used in the transportation (aircraft, speciality car and train parts), manufacturing (aluminum scandium alloys) and technological (fuel cells) sectors.

The market demand for scandium has grown substantially in recent years, however it is currently limited by a low and expensive supply. In 2015 the annual global scandium trade was estimated at approximately 15 tonnes. In comparison, this project aims to produce up to 45 tonnes of scandium oxide a year over 21 years.

There are a number of Government strategic plans for the region that promote economic investment through growth within the mining and resource sectors, including the *Orana Regional Action Plan 2012* and the *Bogan Shire Council Strategic Plan 2026*. There are already a number of resource developments the area, including the Tritton Copper Mine and the Nyngan and Bogan River solar farms (see **Figure 5**). The scale and location of these projects in relation to the Nyngan Scandium Project limits the potential for cumulative impacts. However, the operation of both mines is likely to put pressure on the local housing market, particularly during construction. This is discussed further in **Section 5.4**.

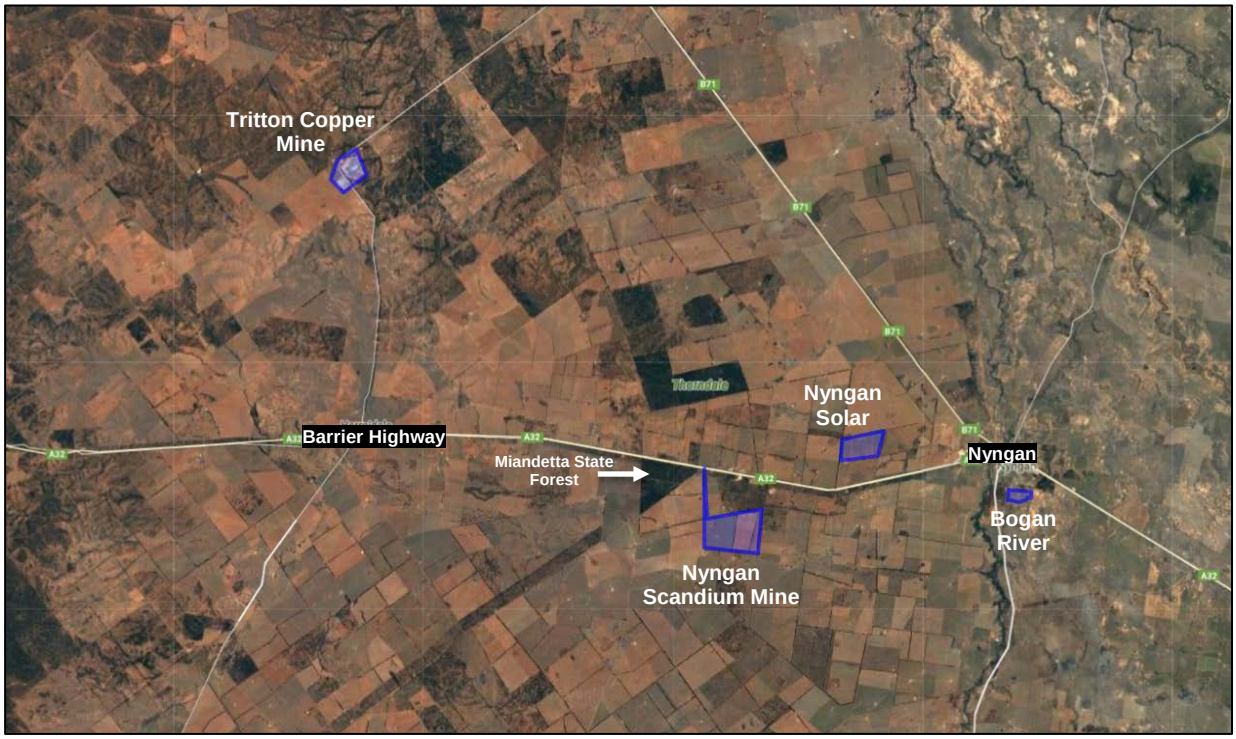

Figure 5: *Project Location*

The primarily agricultural nature of the region means that much of the native vegetation within and surrounding the site has already been cleared for grazing and cropping purposes. The closest major surface water feature (the Bogan River) is over 15 km east of the site.

The 'campaign-style' nature of the proposed mining operations, coupled with the surrounding environmental context, means the potential environmental risks of the project are low. While the processing plant would run on a continual basis all year, open cut mining would only occur for a total of 9 to 15 weeks a year.

Very few rural residential dwellings surround the site, with 11 dwellings located between 3.5 to 7 km from the processing plant, and three dwellings about 1 km from the mine access road (**see Figure 4**). The closest town is Nyngan, which has a population of approximately 2,900 people and is located about 20 km northeast of the site.

The project is well connected to the road network, being located in close proximity to the Barrier Highway, Gilgai Road and Nyngan-Cobar Railway.

3. STATUTORY CONTEXT

3.1 State Significant Development

Under *State Environmental Planning Policy (SEPP) (State and Regional Development)* 2011, the project is classified as State significant development (SSD) as it is development for the purpose of mining with a capital investment value of more than $30 million.

Consequently, the Minister for Planning is the consent authority for the project. However, under the Minister's delegation of 16 February 2015, the Executive Director, Resource Assessments and Business Systems, may determine the development application as there were no objections or political disclosure statements.

3.2 Permissibility

The site is located in the Bogan Local Government Area. Under the *Bogan Local Environmental Plan 2011* the project area is located on land zoned RU1 Primary Production. Open-cut mining is permitted with consent in the RU1 Primary Production zone.

Under Clause 7(1)(b)(i) of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, development for the purpose of mining may be carried out on land where agriculture is a permissible land use. Extensive agriculture may be carried out in the RU1 zone without development consent

3.3 Integrated and Other Approvals

Under Section 89J of the EP&A Act, a number of other approvals are integrated into the SSD assessment process, and consequently are not required to be separately obtained for the project. These include:

- an authorisation under the *Native Vegetation Act 2003* for the clearing of native vegetation; and
- various approvals relating to heritage under the *National Parks and Wildlife Act 1974* and the *Heritage Act 1997.*

Under Section 89K of the EP&A Act, a number of other approvals are required, but must be substantially consistent with any development consent for the project. These include:

- a mining lease required under the *Mining Act 1992*;
- an environment protection licence (EPL) under the *Protection of the Environment Operations Act 1997;* and
- approvals for roads and intersection construction under the *Roads Act 1993*.

EMC also requires other approvals for the project which are not integrated into the SSD approval process, including:

- 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*;
- certain water licences under the *Water Act 1912* and *Water Management Act 2000*; and
- approval under the *Crown Lands Act 1989* for any works on Crown Land.

The project does not require approval from the Commonwealth Minister for the Environment under the *Environment Protection and Biodiversity Conservation Act 1999* as it is not expected to have a significant impact on any matter of national environmental significance.

3.4 Section 79C Considerations

Section 79C(1) of the EP&A Act outlines the matters that a consent authority must take into consideration when determining development applications.

These matters can be summarised as:

- the provisions of environmental planning instruments (including draft instruments), development control plans, planning agreements, and the EP&A Regulation;

- the environmental, social and economic impacts of the development;
- the suitability of the site;
- any submissions; and
- the public interest, including the objects of the Act which include encouraging Ecologically Sustainable Development (ESD).

The Department has considered all of these matters in its assessment of the project, as summarised in **Section 5** of this report. The Department has also given specific consideration to the relevant provisions of environmental planning instruments in **Section 5** and **Appendix E**.

4. CONSULTATION

The Department publicly exhibited the EIS from 25 May 2016 until 24 June 2016, and received six submissions from public authorities. None of the surrounding landowners or members of the general public made a submission.

On 21 and 22 July 2016, the Department inspected the project site and met with Council and OEH to discuss and resolve the key concerns raised by these agencies.

The concerns and advice from agencies is summarised below, focusing on the residual issues where agencies provided additional submissions following the EIS. Full copies of the submissions, and EMC's Response to Submissions, is provided in **Appendices B** and **C**.

None of the government agencies object to the project. However, some agencies raised concerns about the assessment methodology and the potential impacts of the project, and made recommendations on how these issues could be addressed, avoided or minimised. All initial concerns have been resolved.

Bogan Shire Council's key concern related to the potential socio-economic impacts of the project, in particular, ensuring there would be sufficient accommodation to house mine employees, and developing an appropriate Voluntary Planning Agreement. Other matters raised by council included road upgrade requirements, final landform and the minimisation of final voids, and maintaining stock access to the adjacent travelling stock route. These matters have been resolved to the satisfaction of Council, as discussed in **Section 5**.

The **Roads and Maritime Services** (RMS) key concern related to maintaining an appropriate level of safety at the Barrier Highway and Gilgai Road intersection. RMS recommended that EMC undertake more detailed design work to determine the most feasible option to resolve this issue. RMS also requested that EMC ensure this intersection is upgraded to the relevant standards. EMC has committed to resolve both these issues to RMS's satisfaction, as discussed in **Section 5.1** below.

The **Office of Environment and Heritage** (OEH) initially raised concerns about EMC's biodiversity assessment and offset calculations. These issues were resolved to OEH's satisfaction through the provision of additional information.

The **Environment Protection Authority** (EPA) raised concerns about the potential noise impacts of the project during construction of the site access road, and the use of this road by heavy vehicles, at one residential dwelling located immediately adjacent to the proposed access driveway. These issues were resolved to EPA's satisfaction through the provision of additional information.

The **Department of Primary Industries – Water** (DPI – Water) raised concerns about the project's potential impact on groundwater resources due to the uncertainty of the modelled groundwater inflow to the pits. EMC confirmed that under the worst case scenario, there would be no impacts on surrounding water users, and that there is sufficient entitlement in the relevant water source to secure the maximum predicted inflows.

The **Division Resources and Energy** (DRE) within the Department of Industry supports the project, citing the responsible use of the State's resources, employment generation and monetary benefits to the State and national economies. DRE also confirmed that the rehabilitation methodology provided in the EIS were sufficiently detailed to demonstrate that sustainable rehabilitation could be achieved.

5. ASSESSMENT

In accordance with Section 79C of the EP&A Act, the Department has considered the following in its assessment of the project:

- the environmental, social and economic impacts of the project, including EMC's EIS, RTS and additional information provided during the assessment process;
- all submissions received throughout the assessment process;
- applicable environmental planning instruments;
- other relevant NSW Government policies and guidelines;
- the suitability of the site for the project;
- the public interest; and
- other relevant provisions of the EP&A Act and Regulations, including the objects and Section 5A of the Act.

5.1 Traffic and Transport

Access route and traffic volumes

Vehicles would access the site from the northeast via the Mitchell Highway, the Barrier Highway, Gilgai Road and a new site access road (see **Figures 2** and **6**).

The Parkes – Broken Hill Railway line crosses Gilgai Road about 50 m south of the Barrier Highway. EMC considered the option of rail transport, however it was found to be unviable due to the small quantity of scandium oxide to be transported from the site.

During construction, the project is expected to generate a maximum of 38 light vehicle movements and 20 heavy vehicle movements a day (a movement is one vehicle entering and leaving the site). During operations, the project is expected to generate a maximum of 30 light vehicle movements and 10 heavy vehicle movements a day.

However, the predicted maximum heavy vehicle movements are not expected to be consistent as they are based on peak movements (i.e. the delivery of construction materials). Therefore, when averaged over a month, heavy vehicle movements are not expected to exceed 5 movements a day.

Road upgrades

Both RMS and Council support the use of the proposed access route by project-related vehicles, provided the required road upgrades are undertaken.

The key traffic and transport issue relates to achieving the required level of safety at the Barrier Highway/Gilgai Road intersection to accommodate the additional traffic generated by the project.

Vehicles travelling along the Barrier Highway towards Gilgai Road currently have a sight distance of 700 m to the east of the intersection and 200 m to the west. A sight distance of 200 m is inadequate and RMS has advised that the intersection would require one of the following treatments:

- increase the sight distance to at least 300 m for vehicles approaching from the west by lowering a section of the Barrier Highway; or
- construct a right turn acceleration lane in the Barrier Highway for vehicles entering the highway from Gilgai Road.

EMC would be required undertake detailed design work in consultation with RMS to determine the most feasible option. Both the Department and RMS are satisfied that this would be the most appropriate way to address this issue.

To maintain the capacity, safety and efficiency of the road network in general, EMC would also be required to undertake the following road upgrades to the satisfaction of RMS and/or Council:

- upgrade the Barrier Highway/Gilgai Road;
- upgrade Gilgai Road between its intersection with the Barrier Highway and the mine access road, including a minimum 8 m sealed pavement width and 1.5 m shoulders; and
- construct the Gilgai Road/mine access road intersection at least 95 m south of the Barrier Highway.

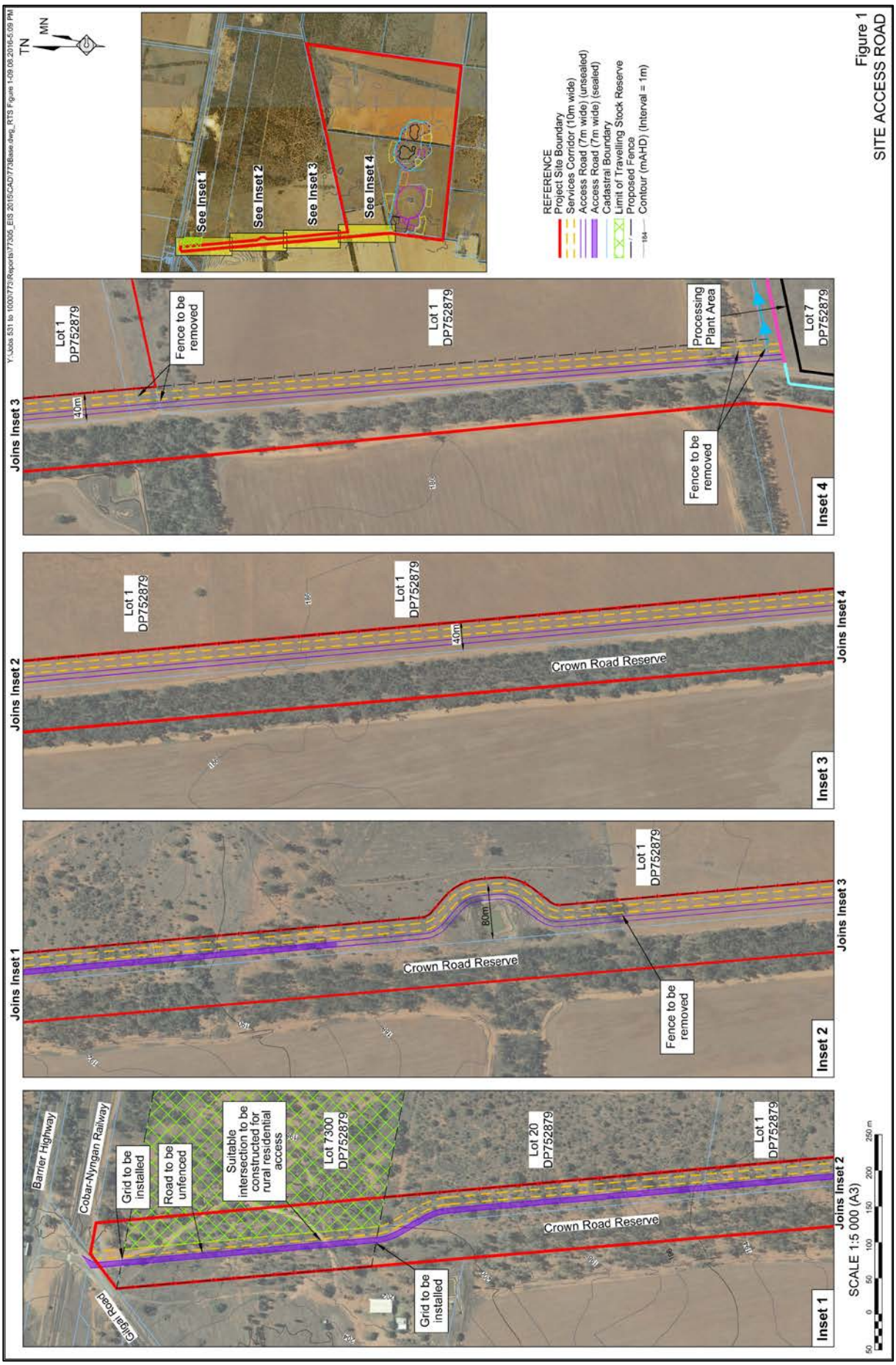

Figure 6: *Proposed Site Access Road*

EMC would be required to construct the mine access road to a minimum width of 7 m with sealed pavement for a distance of 1.5 km from its intersection with Gilgai Road. The access road would not be fenced where it is adjacent to an existing Travelling Stock Route (see **Figure 6**), and EMC would also be required to implement measures to ensure stock has right of way.

Finally, in regard to road maintenance of the short section of Gilgai Road, EMC would provide Council with annual contributions to the value of $20,000 a year, as detailed in the terms of a Voluntary Planning Agreement for the project.

Recommended conditions

The Department has recommended conditions requiring EMC to:

- access the site via the designated haulage route which includes the Mitchell Highway, the Barrier Highway, Gilgai Road and the new site access road;
- limit heavy vehicle movements to a maximum of 20 movements a day, and no more than 5 movements a day when averaged over a month;
- prior to the construction of the mine, undertake the relevant road upgrades to the satisfaction of the relevant roads authority; and
- prepare and implement a Traffic Management Plan in consultation with RMS and Council, including measures to ensure travelling stock has right of way.

Subject to the recommended conditions, the Department, RMS and Council are satisfied that the project would not result in any significant impacts on the road network.

5.2 Biodiversity

The project would disturb 9.3 ha of native woodland vegetation classified as *Poplar Box – Gum Coolabah and White Cypress Pine Shrubby Woodland* mainly in the Cobar Peneplain Bioregion (Biometric Vegetation Type CW 169).

No threatened or endangered ecological communities or threatened flora species listed under the *Threatened Species Conservation Act 1995* (TSC Act) or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were identified on the site.

Twenty threatened fauna species listed under the TSC Act and/or EPBC Act were either identified on the site or considered likely to be found. Tests of significance concluded that there would be no significant impact on any of these species, provided appropriate management and offsetting measures are fully implemented.

However, one of the threatened species (the Grey Crowned Babbler) would be locally impacted by the removal of habitat due to the low mobility of the species. EMC would implement a targeted management and monitoring program to reduce residual impacts on the Grey Crowned Babbler as part of the Biodiversity Management Plan for the project.

To offset the clearance of native vegetation and habitat, EMC would secure and enhance the vegetation and habitat on 88.5 ha of land located to the north of the project site (see **Figure 3**).

Recommended conditions

The Department and OEH are satisfied that EMC has investigated all reasonable and feasible measures to avoid and/or minimise the biodiversity impacts of the project, and that the proposed offset credit requirements and associated final offset package would adequately compensate for the project's residual impacts.

The Department has recommended conditions requiring EMC to:

- implement a Biodiversity Offset Strategy for the project and ensure its long-term security;
- prepare and implement a Biodiversity Management Plan for the project, in consultation with OEH, including management measures and a monitoring program for the Grey Crowned Babbler; and
- meet rehabilitation objectives and prepare a Rehabilitation Management Plan, including revegetation of disturbed areas and conservation of existing native vegetation on site.

5.3 Water

Groundwater
The relevant groundwater water source is the *Lachlan Fold Belt Groundwater Source,* which forms part of the Water Sharing Plan for the *NSW Murray-Darling Basin Fractured Groundwater Sources.* Groundwater in the vicinity of the site is highly saline and of poor quality (i.e. not suitable for stock watering or irrigation) and there is no significant demand for water from this water source. Groundwater flow is generally restricted to fractures within the weathered rock profile, and the standing water level on site ranges from 22 to 25 m below the ground surface.

Inflows to the pits were predicted to range between 73 and 615 mega litres (ML) a year, with 73 ML a year expected to be the most likely scenario. The resultant drawdown radius would range from 1.3 to 3.6 km from the pits.

Under a worst case scenario (i.e. inflow of 615 ML a year) there would be no impact on surrounding groundwater users, groundwater dependant ecosystems or watercourses in the locality.

EMC has confirmed that there is sufficient entitlement in the *Lachlan Fold Belt Groundwater Source* to secure up to 615 ML of water a year.

Recommended conditions
Both the Department and DPI Water accept that the maximum modelled inflow would not result in significant impacts on the relevant groundwater source.

The Department has recommended conditions requiring EMC to prepare and implement a Groundwater Management Plan in consultation with DPI Water, including a program to monitor and report on groundwater inflows into the open cut pits, if relevant.

As a standard condition of consent, EMC would also be required to provide a compensatory water supply to the owner or leaseholder of any privately-owned land whose basic landholder water rights are adversely and directly impacted as a result of the project.

Surface water
The project would remove about 110 ha from the Whitbarrow Creek catchment (i.e. 0.05% of the catchment), which would have negligible impacts on downstream users and environmental flows.

The site is relatively flat and surface water flows from north to south, towards Whitbarrow Creek, which is located about 500 m south of the site. There are no well-defined natural drainage channels within the site.

EMC would typically operate a nil discharge site and the surface water management system would include clean water diversion bunds, erosion and sediment controls and mine water storages. However, under a 1 in 100 year rainfall scenario, this system would have insufficient capacity to store captured water and accumulated (clean) surface water would be pumped to the designated irrigation area (see **Figure 3**).

In addition to rainwater captured on site, EMC would purchase a 170 ML high security water licence under the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources.* EMC has confirmed that sufficient water is available under this plan, and DPI water has raised no concerns in this regard.

Flooding is a risk due to the large upstream catchment associated with Whitbarrow Creek. Flood levee bunds would be installed around the site and a floodway/culvert would be constructed beneath the elevated haul road to exclude and convey flows for all flood events up to a 1 in 1000 year storm event.

Water Quality
Chemicals and fuels would be stored within bunded areas and erosion and sediment controls would be implemented to ensure water quality is maintained. The mine water storages and the residue storage facility would also be designed to ensure water quality is maintained.

The residue storage facility would include two base layers (300 mm of compacted clay overlain by a 1.5 mm HDPE liner) and a system of trenches and collection pipes beneath the HDPE liner would recapture any seepage. The embankment of the facility would include a 7 m thick compacted clay wall, with a maximum permeability of $1x10^{-9}$, and a 1.5 mm HDPE liner welded to the basin liner. At the completion of mining, the facility would be capped with an HDPE liner and compacted clay.

Other water storages that would hold contaminated or non-recyclable water on a continuous basis would be lined in a similar manner. The EPA raised no concerns in this regard.

Recommended conditions

The Department is satisfied that the project has been designed to ensure negligible impacts on surface water resources, and has recommended conditions requiring EMC to:

- ensure there is sufficient water for all stages of the project and if necessary, adjust the scale of mining operations to match the available water supply;
- ensure surface water discharge to the irrigation area does not adversely impact soil salinity levels;
- comply with key water management performance measures, including:
  - maximising diversion of clean water around the site;
  - installing and maintaining flood management infrastructure;
  - storing chemical and hydrocarbon products in bunded areas; and
  - constructing the Residue Storage Facility to prevent migration of pollutants due to seepage; and
- prepare and implement a Surface Water Management Plan, in consultation with DPI Water, including a site water balance and a program to monitor and report on the effectiveness of the water management system.

5.4 Other Issues

Table 6: *Assessment of Other Issues*

Issue	*Consideration*	*Recommendation*
Construction Noise	• During construction of the access driveway, noise emissions would comply with the noise management levels in the *Interim Construction Noise Guideline* (ICNG) at all receivers except R4. • R4 would experience a short term exceedance of 9 dB(A) above the ICNG criteria of 40 dB(A), however this level would still be below the maximum levels in the ICNG. • The Department is satisfied that construction noise can be minimised by implementing the noise mitigating work practices detailed in Tables 5 to 8 of the ICNG. These include scheduling activities to minimise noise, using quieter equipment, informing potentially affected neighbours and establishing a complaints handling procedure.	• Minimise any noise generated by the construction of the mine access road in accordance with the best practice requirements outlined in the ICNG. • Restrict mine access road construction hours to Monday to Friday 7 am – 6 pm, and Saturday 8 am – 1 pm.
Operational Noise	• Operational noise includes mining, processing and construction activities (excluding construction of the access road and services corridor), and vehicles using the mine access road. • Under a worst case scenario, the project would comply with the project specific noise level (PSNL) of 35 dB(A) at all receivers. • No exceedance of the sleep disturbance criteria is predicted, and road traffic noise levels are predicted to comply with the *Road Noise Policy* (RNP) criteria at all receivers. • Both the Department and the EPA are satisfied that the project would not significantly impact the amenity of surrounding receivers, provided the recommended conditions of consent are implemented.	• Comply with the operational noise criteria of 35 dB(A) at all receivers. • Restrict delivery and dispatch hours to between 6 am – 6 pm, 7 days a week. • Implement all reasonable and feasible measures to minimise operational and road noise emissions generated by the project. • Monitor and report on compliance with the relevant noise management criteria.

Issue	*Consideration*	*Recommendation*
Dust	• Under a worst case scenario, the project is expected to comply with the air quality management criteria for particulate matter at all receivers. • Both the Department and the EPA are satisfied that EMC has adequately demonstrated that the project would not impact local or regional air quality through the generation dust.	• Minimise dust emissions from the site. • Minimise the surface disturbance of the project, including implementing interim rehabilitation strategies to stabilise areas prone to dust generation that cannot be permanently rehabilitated. • Carry out any monitoring required by the EPA.
Gaseous Emissions	• Processing activities would generate point source and fugitive emissions, including nitrogen dioxide, carbon monoxide, sulphur dioxide, hydrogen sulphide and minor volatile organic compounds. • The project is expected to comply with the applicable criteria for all gaseous emissions. • Both the Department and the EPA are satisfied that EMC has adequately demonstrated that the project would not impact local or regional air quality through the release of gaseous emissions.	• Minimise the gaseous emissions of the project to ensure compliance with the requirements in any EPL or the relevant requirements of the *Protection of the Environment Operations (Clean Air) Regulation 2010* and the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW.* • Carry out any monitoring required by the EPA.
Greenhouse Gas	• The project would generate greenhouse gas emissions equivalent to 0.0083% of NSW's annual emissions and 0.0021% of Australia's annual emissions. • The Department accepts that the greenhouse gas emissions generated by the project would be relatively minor.	• Minimise greenhouse gas emissions generated by the project. • Carry out any monitoring required by the EPA
Hazards and Risk	• Under SEPP 33, the project is classified as a potentially hazardous industry due to the quantity of dangerous goods that would be stored on site, including sulphuric acid, hydrochloric acid and liquefied petroleum gas. • Studies carried out in accordance with the relevant *Hazardous Industry Planning Advisory Paper Guidelines* concluded that the potential risks of the project on human health and the environment would be minimal, provided appropriate controls are implemented. • The Department's specialist Hazardous Assessment Team agreed with the findings of EMC's assessment.	• Ensure that the storage, handling and transport of dangerous goods is carried out in accordance with the relevant Australian Standard. • Prepare and implement an Emergency Plan and a Safety Management System. • Undertake a hazard audit as a component of the Independent Environmental Audit.
Visual	• Due to the distances between representative viewpoints and the mining area (i.e. minimum of 3.5 km to the nearest residence), as well as the screening provided by existing vegetation, the project would have minimal visual and lighting impacts. • To further minimise potential impacts, directional, low intensity lighting, and neutral colour materials would be use for the processing plant.	• Minimise the visual impacts of the project, including designing the project to blend in with the surrounding landscape, and screening the project from sensitive receivers. • Minimise the off-site lighting impacts of the project in accordance with the relevant Australian Standard.
Heritage	• No aboriginal sites or areas of Aboriginal archaeological potential were identified on the site. Site surveys and consultation with Aboriginal stakeholders identified the site as having low archaeological potential due to previous disturbance. • No items listed on any of the relevant heritage registries are located within the project area, and no items of historic heritage significance in the vicinity of the project would be disturbed.	• Prepare a Chance Finds Protocol, to the satisfaction of OEH, to mitigate potential impacts on any unexpected heritage items found over the life of the project.

Issue	*Consideration*	*Recommendation*
Land	• The Department is satisfied that the project would have minimal impacts on the agricultural resources and enterprises in the region. • The site would be progressively rehabilitated to support land uses similar to pre-existing land uses, including restoration of agricultural land (see **Figure 4**). • The proposed final land form would include grassland (28.6 ha), woodland (242.9 ha), water storages (1.5 ha), agricultural land (716 ha) and two final voids (10 ha). • Technology constraints currently prevent EMC from backfilling the final voids with tailings. EMC would undertake trials to increase the density of the tailings material, which if successful may reduce the size of the Residue Storage Facility and final voids. • Both OEH and DRE are supportive of EMC's proposed final land form and rehabilitation strategy.	• Comply with rehabilitation objectives, including restoring land capability and vegetation, minimising the size and depth of the final voids, and ensuring the site is maintained in a safe, stable and non-polluting condition. • Prepare a Rehabilitation Management Plan. • Prepare an updated Tailings Management Strategy in consultation with DRE, including research into the feasibility of increasing the density of the tailings, assessing the merits of placing tailings in pit, and proposing a strategy for the ongoing management and disposal of tailings on site.
Workforce Accommodation	• Jobs would preferentially be offered to residents located within the Bogan local government area. • The Department and Council consider that it would not be possible to source all 60 construction employees and 75 operational employees from the local area given the size of the local population. • To ensure there would be sufficient accommodation to house employees who have moved into the area, EMC would arrange accommodation for its workforce at existing facilities such as motels, farm houses and rented houses, or through the construction of new facilities, and/or through the establishment of a dedicated workforce accommodation facility. • EMC and the owner of the Tritton Copper Mine have commenced discussions relating to the establishment of a joint mine camp in Nyngan. • The Department and Council are satisfied with this approach.	• Prepare an Accommodation Strategy in consultation with Council, including: - updated estimates of the likely accommodation demand; - options for minimising any adverse impacts on the Nyngan housing market, including potentially working with the owner of the Tritton Copper Mine; - a strategy to facilitate the accommodation of the workforce associated with the development; and - a program to monitor and review the effectiveness of the strategy over the life of the development.
Socio-Economic	• The project would generate local employment and expenditure within the regional economy, including the generation of 60 construction jobs and 75 operational jobs, increased direct and indirect spending in the region with a capital expenditure of around $124.4 million, and around $12.4 million a year to the local economy and $39 million a year in royalties for the State and national economies. • Council and EMC have agreed on the general terms of a contributions package for the project, which includes $125,000 of funding each year to be spent by Council on community services and organisations, infrastructure projects, road maintenance and repairs, and Council planning. • The Department is satisfied that the project would have a positive socio-economic impact on the locality and region.	• Enter into a VPA with Council to the value of $125,000 apportioned in accordance with the terms of the VPA agreed between Council and EMC.

6. RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of consent for the project (see **Appendix D**). These conditions are required to:

- prevent, minimise, and/or offset adverse impacts of the project;
- set standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

7. CONCLUSION

The Department has assessed the development application, EIS, submissions, RTS and additional information provided by EMC in accordance with the requirements of the EP&A Act. The Department has also considered the objects of the EP&A Act and the relevant considerations under section 79C of the EP&A Act in its assessment of the project.

The Department is satisfied that the project encourages the proper use of resources, the protection of the environment, and ecologically sustainable development.

The Department considers the project to be suitably located as it would be developed in an area largely cleared for grazing and cropping, and would not have a significant impact on threatened species and their habitats. Additionally, there are few landowners in close proximity to site, none of whom made submissions on the project, the site has access to existing transport infrastructure, and the project is located in a scandium rich region of NSW.

Importantly, the project would result in benefits to the wider community by helping to meet the demands for scandium, of which little is currently produced on a national and international scale.

The project would also provide associated flow-on benefits to the local and regional communities through:

- the generation of 60 construction jobs and 75 operational jobs;
- increased spending in the region with a capital expenditure of around $124.4 million;
- $12.4 million a year to the local economy and $39 million a year in royalties for the State and national economies; and
- EMC's proposed Voluntary Planning Agreement with Council.

Further, the project aligns with a number of State and regional strategic plans that recognise the importance of mining developments within Western NSW as a key industry that will help grow and diversify the NSW economy by increasing local employment opportunities in regional areas.

Based on its assessment, the Department is satisfied that EMC has designed the project in a manner that achieves a reasonable balance between maximising the efficiency of the resource extraction and minimising the potential impacts on surrounding land users and the environment.

The Department has drafted a detailed set of conditions to ensure that the project complies with applicable criteria and standards, and to ensure that the predicted residual impacts are effectively minimised, mitigated and/or at least compensated for.

On balance, the Department believes that the project is in the public interest and should be approved, subject to conditions.

8. RECOMMENDATION

It is recommended that the Executive Director:

- **considers** the findings and recommendations of this assessment report;
- **approves** the development application for the Nyngan Scandium Project; and
- **signs** the attached recommended conditions of consent (**Appendix A**).

8/11/16

Elle Donnelley
Planning Officer
Resource Assessments

8/11/16

Clay Preshaw
A/Director
Resource Assessments

APPENDIX A:
ENVIRONMENTAL IMPACT STATEMENT

See website at http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5157

APPENDIX B:
SUBMISSIONS

See website at http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5157

APPENDIX C:
RESPONSE TO SUBMISSIONS

See website at http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5157

APPENDIX D:
RECOMMENDED CONDITIONS OF CONSENT

See website at http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5157

APPENDIX E:
ENVIRONMENTAL PLANNING INSTRUMENTS

Bogan Local Environmental Plan 2011
The site is located in the Bogan Local Government Area. Under the *Bogan Local Environmental Plan 2011*, the project area is located on land zoned RU1 Primary Production. Open-cut mining is permitted with consent in the RU1 Primary Production zone.

SEPP No 33 – Hazardous and Offensive Development
The project is considered to be potentially hazardous due to the quantity of dangerous goods proposed to be stored on site. As detailed in **Section 5.4** if this report, the project would not be hazardous with the implementation of appropriate controls were. Consequently, the Department is satisfied that the proposal is generally consistent with the aims, objectives, and requirements of *SEPP No 33.*

SEPP No. 44 – Koala Habitat Protection
The Bogan Local Government Area is not identified as an area of potential Koala habitat in Schedule 1 of SEPP No. 44.

SEPP No. 55 – Remediation of Land
The Department is satisfied that there is limited risk of any material contamination of the land subject to the application and that the project is generally consistent with the aims, objectives, and provisions of SEPP 55.

SEPP (State and Regional Development) 2011
The proposed development is declared to be State Significant Development under Section 89C of the EP&A Act as it is development for the purpose of mining with a capital investment value of more than $30 million, which is specified in Clause 5 of Schedule 1 to *State Environmental Planning Policy (State and Regional Development) 2011.*

SEPP (Infrastructure) 2007
In accordance with clause 104 of *SEPP (Infrastructure) 2007*, the application was referred to RMS. The matters raised in RMS' submission on the project were considered by the Department, and the Department has recommended conditions of consent in relation to the classified road network (see **Section 5.1** of this report). The Department is also satisfied that the project would not significantly impact surrounding rail or electricity infrastructure.

SEPP (Mining, Petroleum Production and Extractive Industries) 2007
Under Clause 7(1)(b)(i) of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, development for the purpose of mining may be carried out on land where agriculture is a permissible land use. Extensive agriculture may be carried out in the RU1 zone without development consent.

Part 3 of the Mining SEPP lists a number of matters that a consent authority must consider before determining an application for consent for development for the purposes of mining, including:
- certain non-discretionary development standards in relation to noise, air quality, blasting and aquifer interference;
- compatibility with other land uses;
- natural resource management and environmental management;
- resource recovery;
- transport; and
- rehabilitation.

The Department has considered all of these matters in its assessment and is satisfied that the project is able to be managed in a manner that is generally consistent with the aims, objectives and provisions of the Mining SEPP.