Scoping Report

FEBRUARY 2

Hawsons Iron Pty Ltd

Hawsons IRON
WORLD'S BEST IRON ORE PRODUCT

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1 Summary

Hawsons Iron Ltd proposes to develop an open cut magnetite mine in far central-western New South Wales (NSW). The project is located approximately 60 kilometres south-west of Broken Hill, in close proximity to the South Australia border.

The project would lie within and across internal boundaries of three contiguous exploration licences. The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (2012) (JORC Code and Guidelines) estimated reserve at the Core prospect at Hawsons, the subject of this Scoping Report, is interpreted to extend at least to a vertical depth of about 400m below surface over a 4km strike length. The project is expected to have an annual production target of up to 20 million tonnes per annum of magnetite concentrate from approximately 160 million tonnes per annum run-of-mine ore with initial project sizing based on time to first product and existing infrastructure capacity. Hawsons Iron Ltd would apply open cut mining methods to produce magnetite concentrate. The run-of-mine ore would be crushed, ground and magnetically separated on site to produce a high grade magnetite concentrate.

The project is State Significant Development under the State Environmental Planning Policy (State and Regional Development) 2011 and Hawsons Iron Ltd is therefore seeking development consent under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act 1979* for the project.

The project was referred to the (then) Department of Environment and Energy on the 20 June 2018 (EPBC Act referral 2018/8241) and the Department determined on the 14 September 2018 that the project is not a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999.*

Hawsons Iron Ltd presented a Conceptual Project Development Plan to the (then) NSW Department of Industry and Investment – Division of Mineral Resources on 11 March 2011; now the NSW Department of Planning and Environment – Resources and Geosciences Division. In 2011, NSW Department of Industry and Investment – Division of Mineral Resources notified the (then) Department of Planning that it supported the project in principle.

Further engineering studies would be undertaken for the bankable feasibility study and this would take place in parallel with the environmental impact statement. This would involve conducting route options analysis for ancillary infrastructure corridors.

Hawsons Iron Ltd would submit an EIS to the NSW Department of Planning and Environment that would assess potential impacts associated with the project. Potential areas of environmental risk may include hydrogeology, ecology, and Aboriginal cultural heritage. The project also has the potential to increase demands on social services in the region. These key environmental aspects would be thoroughly assessed as part of a wider suite of studies to inform the project.

Stakeholders including government agencies, representatives of the Aboriginal community, landholders and the broader community would be consulted during preparation of the EIS. This would provide opportunities for ongoing iterative feedback during the approvals process.

The project has the potential to generate substantial positive impacts by creating direct and indirect employment in the Broken Hill region and contributing royalties to the NSW economy.

2 Introduction

2.1 Background to this report

Hawsons Iron Ltd (herein referred to as HIO) (previously Carpentaria Resources) proposes to develop the Hawsons Iron Project (HIP, or, 'the project') open cut magnetite mine in far central-western NSW. The mine will produce magnetite concentrate (from siltstone iron oxide ore) to be used in the global iron and steel industry. The HIP is located in the globally significant Braemar Ironstone Formation, a large magnetite prospect approximately 60 kilometres south-west of Broken Hill, adjacent to the South Australian border (refer to Figure 1). Pilot testing by HIO indicates that the HIP has the potential to produce the highest quality, purest magnetite in the world at around 69.7% iron (Fe). The HIP would be the first Australian iron ore project to meet magnetite concentrate product specifications required for direct reduction steel making and enable the industry to move towards green steel production.

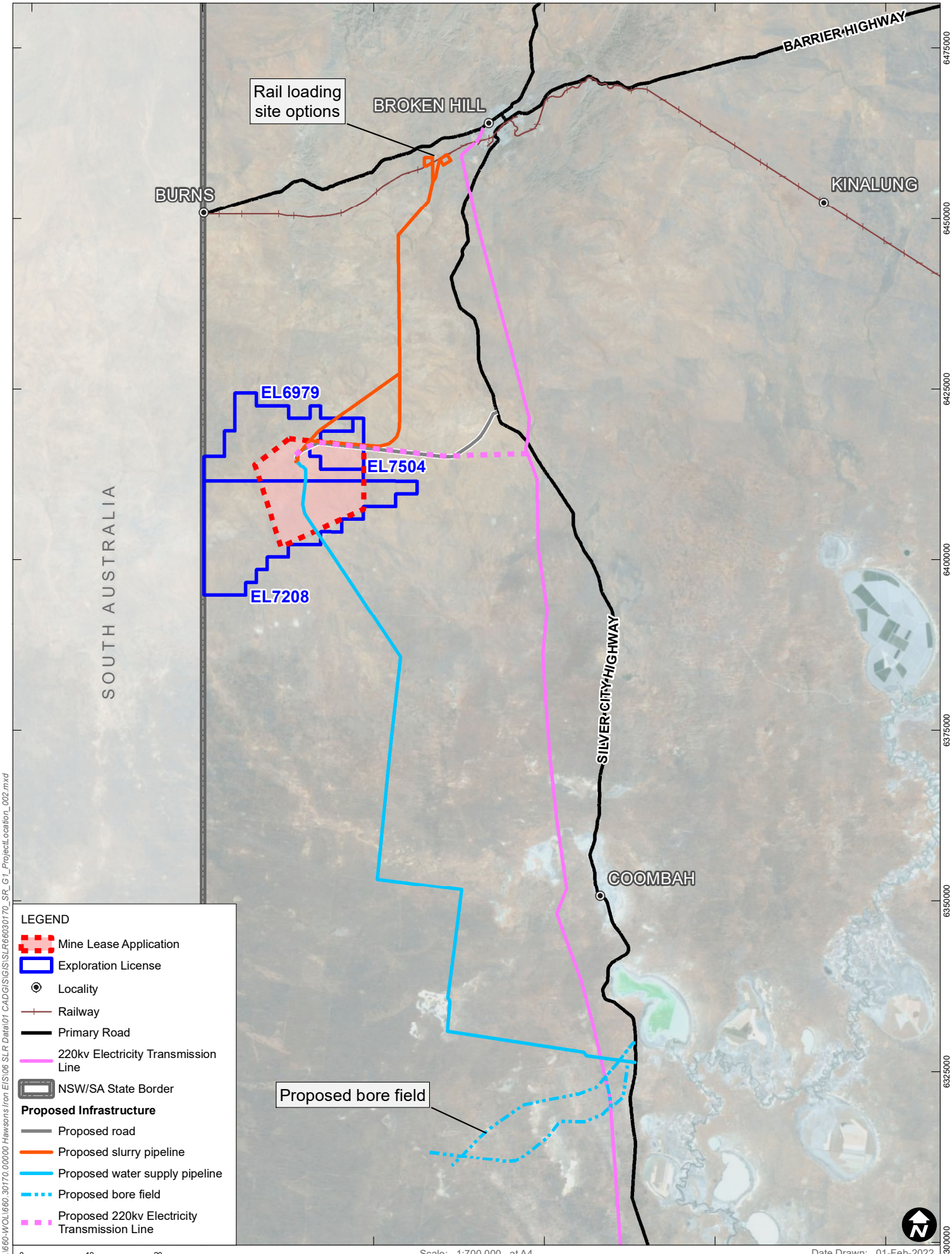
The project lies within and across the internal boundaries of three contiguous exploration licences (ELs) 6979, 7208 and 7504. Under the New South Wales (NSW) *Mining Regulation 2016* (Schedule 2 and *Mining Act 1992*), the ELs are Group 1 licences (base and precious metals in particular magnetite). HIO has submitted a mining lease application (MLA) 460 which includes part of all three ELs. The MLA is currently pending the outcome of the environmental approvals for the proposed project and may result in a reduced area.

The project requires development consent under Part 4 Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The then Department of Planning and Infrastructure issued Director-General's requirements (DGRs) for the environmental impact statement (EIS) for the project on 6 November 2012. The DGRs expired in November 2014 and were reissued as Secretary's Environmental Assessment Requirements (SEARs) in April 2015, May 2017 and again in May 2019. As the SEARs are expiring in February 2022, HIO is submitting this Scoping Report as part of a request to have the SEARs reissued.

Following receipt of the DGRs in 2012, HIO commenced a range of tasks to address the DGRs and SEARs to optimise the project and obtain baseline information for inclusion in the EIS. These investigations include:

- Ecological, Aboriginal and historic heritage surveys within the proposed mine site footprint and along the majority of the proposed infrastructure corridors. These studies have assisted to identify potential constraints that will be used to further refine the project where feasible to minimise environmental impacts
- Groundwater monitoring and pump testing. This has provided information on the capacity and potential aquifers that may be able to provide a sustainable water source for the project
- Opportunistic surface water sampling during flow events in the ephemeral water features at the mine site
- Ambient air quality monitoring (21 April 2011, Preliminary Air Quality Assessment for Hawsons Mine, Job no. 21/19938/04)
- Site selection studies for the transport options including associated processing plants
- Engineering investigations to optimise the layout of the processing plant and identify options for the infrastructure corridors
- Consultation with landholders that have the potential to be affected by the mine site and infrastructure corridors
- Consultation with key government agencies.

This Scoping Report includes a conceptual project description to provide the NSW Department of Planning and Environment (DP&E) and other relevant government agencies with sufficient information to prepare the SEARs for the EIS.



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SLR

Data Source: Basedata, NSW SS, 2022
Aerial Imagery © Department of Customer Service 2020
Proposed Infrastructure digitised from Hawsons Iron Project (GHD, August 2019).
Proposed Infrastructure accuracy limitation - data not appropriate for large scale maps (<1:50,000)

PROJECT LOCATION

FIGURE 1

This report uses information including exploration drilling results, geological modelling, a scoping study (Koenig Consulting and GHD, 2010), pre-feasibility studies (GHD 2011, 2014 and 2017), and baseline environmental data. This report provides high-level conceptual information on the mineral resource, in addition to an overview of the key environmental risks related to the proposed development of the project. Further information will become available following completion of a bankable feasibility study (BFS) and an EIS.

HIO presented the Conceptual Project Development Plan (CPDP) for the project to the (then) NSW Department of Industry and Investment – Division of Mineral Resources (I&I-MR) on 10 March 2011. On 14 March 2011, I&I-MR notified the (then) NSW DPI&E that it supported the project in principle.

2.2 Project description

The project is expected to have an annual production target of up to 20 million tonnes per annum (Mtpa) of magnetite concentrate from approximately 160 Mtpa run-of-mine ore (ROM) with initial project sizing based on time to first product and existing infrastructure capacity. A PFS was completed for the project in April 2011 (GHD 2011) which was updated in January 2014 (GHD 2014). A further revised PFS for a 12 Mtpa option was completed in 2017 (GHD 2017).

The open cut pit is expected to be mined using conventional truck and shovel methods that would include drill and blast with options for alternative materials handling to be investigated including in-pit crushing and conveying. The ore would be beneficiated by on-site crushing, grinding and magnetic separation to produce the high-grade magnetite concentrate. The magnetite concentrate would be sold as feed to steelmaking customers in Asian, Middle East and European countries for use in direct reduction iron and blast furnace smelters. Export is proposed from an existing or bespoke port on the Spencer Gulf in South Australia.

The concentrate transport option as described in the 2017 pre-feasibility study (PFS) had the product being transported from the on-site processing plant to a location approximately 60 kilometres north-east of the mine site near Broken Hill via a slurry pipeline (proposed in 2017 PFS) and then onto rail as filter cake for transport to South Australian (SA) port facilities. During 2021/2022 HIO through their bankable feasibility study (BFS) have progress the transport solution further, giving consideration to environmental, social, economic and engineering opportunities and constraints to minimise impacts and maximise returns. The current BFS option that is undergoing further investigations is the construction and operation of a slurry pipeline from the mining lease to a port in SA for export. The final concentrate would be thickened and pumped through a slurry pipeline. The slurry would use desalinated make-up water produced by an on-site reverse osmosis plant that would use saline water feedstock sourced from the water supply borefield. The magnetite product would then be transported to the port and the filtrate water would be returned to the mine site via a return water pipeline located adjacent to the slurry pipeline. The return water would be reused at the mine site to reduce overall water demand.

The project upon which this Scoping Report is based is described above and includes:

- An open cut pit
- A RoM ore processing plant which would include magnetic separators and associated plant and equipment
- A waste rock storage facility
- A tailings storage facility (TSF)
- A mine infrastructure area (MIA).

The project would also require a range of ancillary infrastructure, including:

- Product transport infrastructure
- Electrical and communications infrastructure
- Road access
- Water supply infrastructure including a borefield and pipeline to the mine site. Where needed a reverse osmosis desalination plant would be constructed to treat saline groundwater.

Further investigations are being undertaken to determine the feasibility of using renewable power at the mine site and onsite power storage. This may include engaging external parties to provide renewable power for the project. This would be included in the EIS if it is determined to be feasible.

The conceptual layout for the proposed mine is indicative at this stage and remains subject to minor adjustments commensurate with the findings of the EIS investigations, ongoing metallurgical testing, and the BFS. This feasibility study will further progress current route options for the linear infrastructure components of the project, giving consideration to environmental, social, economic and engineering opportunities and constraints to minimise impacts and maximise returns.

2.3 The proponent

HIO, a Brisbane based Australian Stock Exchange (ASX) listed company is the proponent, with a 6% Joint Venture partner in Starlight Pty Ltd, with HIO solely focussed on the development of the HIP. HIO was listed on the ASX in 2007 and since that time has spent in excess of $30 million on mineral exploration and development in NSW alone. Table 1 summarises contact details for HIO.

HIO plans to continue to manage and develop the project with its partner and additional parties as required. The project would require capital investment of approximately $USD 1.4 - $USD 3.0 billion to develop both the mine site and supporting infrastructure.

Table 1. Proponent details

Proponent Details	
Name	Hawsons Iron Limited
Postal address	Level 21, 12 Creek Street Brisbane QLD 4000
ABN	63 095 117 981
Nominated contact	Bryan Granzien
Contact details	+61 (0)7 3220 2022
Name and qualifications of the person that prepared the Scoping Report	Brendan Cowie, Bachelor of Environmental Science

2.4 Overview of the approval process

The project is classed as State Significant Development under the NSW State Environmental Planning Policy – State and Regional Development 2011 (State and Regional Development SEPP). HIO is therefore seeking development consent under Part 4, Division 4.7 of the EP&A Act for the project which is described above.

The project has been referred to the (then) Commonwealth Department of Environment and Energy under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The Minister decided that the project is not a controlled action requiring approval under the EPBC Act (EPBC Act referral 2018/8241).

2.5 Terms used in this report

The following terms are used in this report:

- The ‘project’ refers to the infrastructure described in the site description and operational description sections
- The ‘project area’ refers to all areas within the general footprint of the project, including the mine and associated ancillary infrastructure as shown in Figure 1.
- The ‘mine site’ is shown in Figure 1 and would contain project components including but not limited to the pit, waste rock dump, tailings storage facility and processing plant.
- The ‘ancillary infrastructure’ refers to the linear infrastructure that is required for the project as shown on Figure 1. This includes, but is not limited to, the water supply borefield and pipeline, electricity supply transmission line, access road, electrical and communications infrastructure and product transport infrastructure.

3 Site description

3.1 Regional context

The mine site is located approximately 60 kilometres south-west of Broken Hill, adjacent to the SA border (refer to Figure 2). The mine is within the Far West Region which consists of eight local government areas: Balranald, Brewarrina, Bourke, Broken Hill, Central Darling, Cobar, Walgett, Wentworth and an Unincorporated Area. The proposed mine is wholly within the 'Unincorporated Far Western Region' area. It also lies wholly within the Western Local Land Services region.

The mine site is approximately 30 kilometres west of the Silver City Highway, Barrier Highway to the north and Netley Road to the south. A 220 kV electricity grid transmission line runs in close proximity to the Silver City Highway. EL6979 and EL7208 both run through crown land.

The site is located on the southern foothills of the Barrier Ranges, the southern limb of which is a series of north-east to north-west trending ridges that rise above the surrounding plains. The ranges are oriented in a roughly north-south direction, east of the border between New South Wales and South Australia. It is an area of slightly higher ground lying between the lower lands along the Darling River, and lower ground in South Australia. The site itself is a predominantly flat, open chenopod shrubland plain with minor subdued rocky rises and outcrops.

The Region's water supply is mostly delivered through its major rivers, which are susceptible to rainfall deficiencies and interruptions upstream. Streams generally tend to flow in a southwest direction as water is drained from the Barrier Ranges and flow towards the Murray Basin. Depending on the variable levels of discharge, water features either terminate in extensive swampy depressions or continue to the Darling River system.

The mean rainfall for the Broken Hill Bureau of Meteorology station is 245 millimetres per year; a value which is around 10% of the annual evaporation rate of 2,600 millimetres.

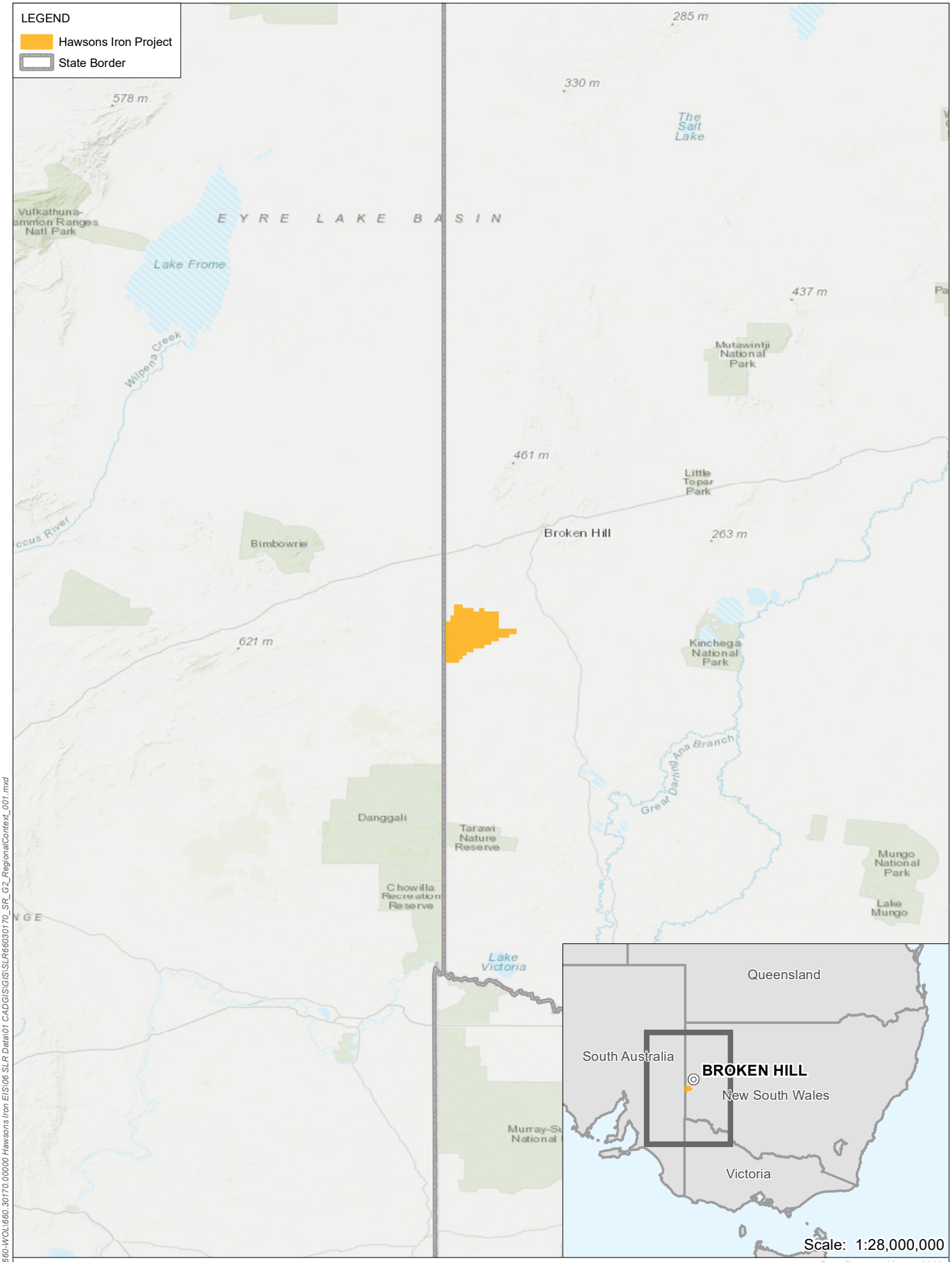
Further details of the regional context are presented below in the preliminary environmental assessment section.

3.2 The mine site

The proposed mine site is a predominantly flat, open chenopod shrubland plain with minor subdued rocky rises and outcrops (refer to Plate 1 and Plate 3). Plate 3, taken during initial reconnaissance exploration in 2009, is indicative of the Hawsons landscape. The location shown in Plate 2 is currently within the south-eastern wall of the proposed pit.

The main local water feature is the ephemeral, river red gum fringed, Harry Harry Creek, which traverses the western site boundary. Plate 3 shows Harry Harry Creek in 2010 near the Burta homestead.

The current land use of the proposed mine site is grazing on both the Burta and Wonga stations. HIO are completing additional resources definition drilling for the BFS, plus may continue further exploration and drilling in the area.



Data Source: Basedata, NSW SS, 2022, Geoscience Australia
Basemap supplied by ESRI and other sources

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REGIONAL CONTEXT OF THE SITE

FIGURE 2

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Plate 1. Hawsons mine site landscape, 2018

Plate 2 Harry Harry Creek, 2010

3.3 Land use and ownership

The proposed mine site is located on two Western Lands Lease pastoral properties: known as Burta and Wonga (refer Figure 2). Consultation with other potentially affected landholders and leaseholders is ongoing and includes discussions around the linear infrastructure corridor options, which will be further refined during the BFS, based on environmental, economic and stakeholder inputs. HIO has confirmed that these land parcels are Perpetual Leasehold land.

Table 2 summarises the Lot and Deposited Plans within the project site, and associated land tenure.

Table 2. Land tenure in the project site

Lot and DP	Lot and DP
Lot 5146 DP 768429	Lot 2 DP 1083729
Lot 266 DP 760963	Lot 6320 DP 769208
Lot 1316 DP 762980	Lot 6178 DP 769029
Lot 1317 DP 762981	Lot 4600 DP 767764
Lot 1318 DP 762982	Lot 1 DP 754527
Lot 1 DP 1174747	Lot 3 DP 757140
Lot 2 DP 1174747	Lot 5279 DP 768194
Lot 97 DP 760496	Lot 267 DP 760958
Lot 4753 DP 762504	Lot 6806 DP 823918
Lot 1014 DP 762230	Lot 1 DP 533248
Lot 4736 DP 760432	Lot 4750 DP 762501
Lot 3508 DP 765800	Lot 148 DP 760640
Lot 5505 DP 768414	Lot 5520 DP 768430
Lot 1864 DP 763776	Lot 5298 DP 768213
Lot 6177 DP 769028	Lot 4281 DP 766969
Lot 6176 DP 769027	Lot 98 DP 760663
Lot 6175 DP 769026	Lot 6 DP 748876
Lot 5358 DP 768269	Lot 1 DP 533249
Lot 1 DP 1083729	Lot 1 DP 1101500

4 Capital investment, mining royalties and employment

4.1 Capital investment

The estimated capital cost of the project is about USD $1.4 - 3.0 billion. The capital cost is under constant revision. Importantly, the use of common infrastructure facilities owned by others including the port, transport facilities and power supply assist the project economics. The final capital investment value will be refined during the BFS.

4.2 Mining royalties

The value of the magnetite concentrate produced is estimated to be $2.4 to $7.3 billion per year, depending on global markets and contracts. Based on current market prices for 20 Mtpa of magnetite concentrate, the project has the potential to contribute approximately $60 to $200 million in royalties per year to the NSW Government.

4.3 Employment

The project would provide regional employment opportunities for existing residents when operational with an increase in employment opportunities during Project construction. The project will also inject additional money into the local economies of Broken Hill and surrounding areas.

The project would directly employ about 500 people at the mine site when it is operating at the annual production target of up to 20 Mtpa of magnetite concentrate. In addition, construction of the project is considered to require a total of 1,200 workers during the two year construction period.

Where possible, personnel would be drawn from the local Broken Hill workforce, however, workers from outside the Broken Hill region would likely also be required due to the high skill requirements of certain roles. Engagement with local Aboriginal parties will occur prior to construction and operations to determine what employment opportunities are available to the local Aboriginal communities.

HIO expects that the long-term operational workforce could be based in Broken Hill and travel to the site on a daily basis. The project would therefore expand employment opportunities in an industry sector that has a long history in Broken Hill and surrounding regions.

4.4 Timeframe for development of the proposal

The project details would continue to be refined during the BFS, including the preparation of a detailed schedule. Indicative dates for key milestones to develop the project, subject to funding and approvals include:

- Prefeasibility study – completed June 2017
- Bankable Feasibility Study – Quarter 4 2021 to Quarter 4 2022
- Detailed engineering design – Quarter 3 2022 to Quarter 4 2022
- Financing in place – Quarter 2 2022
- Construction –Quarter 1 2023 to Quarter 2 2024 after receiving planning approval
- Pre-stripping – Quarter 1 2024 to Quarter 2 2024
- Plant commissioning – Quarter 1 2024
- First production – Quarter 2 to Quarter 3 2024.

5 Overview of the resource

5.1 Mine geology and resource

HIO is aware of the presence of additional magnetite prospects in the Project area that have been identified through magnetic surveys. The location of the additional magnetite prospects (T, Wonga and South-East limb) are within HIO's existing exploration licences is shown on Figure 2. The project as described herein refers only to the Core target anomaly on Figure 3.

Hellman & Schofield, now H&S Consultants Ltd (HS&C)) (2010, 2014, 2017 and 2021) completed mineral resource estimates for the Core anomaly area of the project based on exploration drill- hole data and the subsequent geological interpretation. The most recent resource estimate was reported in October 2021. The estimates have been reported using the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code and Guidelines) (2012). The resource estimate is summarised below.

5.1.1 Geology

The project site is prominent in regional aeromagnetic data as a large, curvilinear, high amplitude magnetic anomaly interpreted to be a regional scale fold of magnetite-rich Braemar Ironstone within the Adelaide Fold Belt. Magnetite present in the three ELs had a major effect on the magnetic surveys for the area. As a result, the location of potential magnetite ore resources can be traced directly to the aeromagnetic imagery (refer to Figure 3).

The exploration drilling completed to date has confirmed that the magnetic surveys precisely outline the magnetite resources and can therefore be used for predicting the location and quantity of magnetite resources available.

Accordingly, HIO has divided the area captured by their exploration licences into a series of target areas as shown in Figure 3. The primary Core target was drilled to JORC inferred and indicated resource status during 2010 and then again in 2016, and is the subject of this development application.

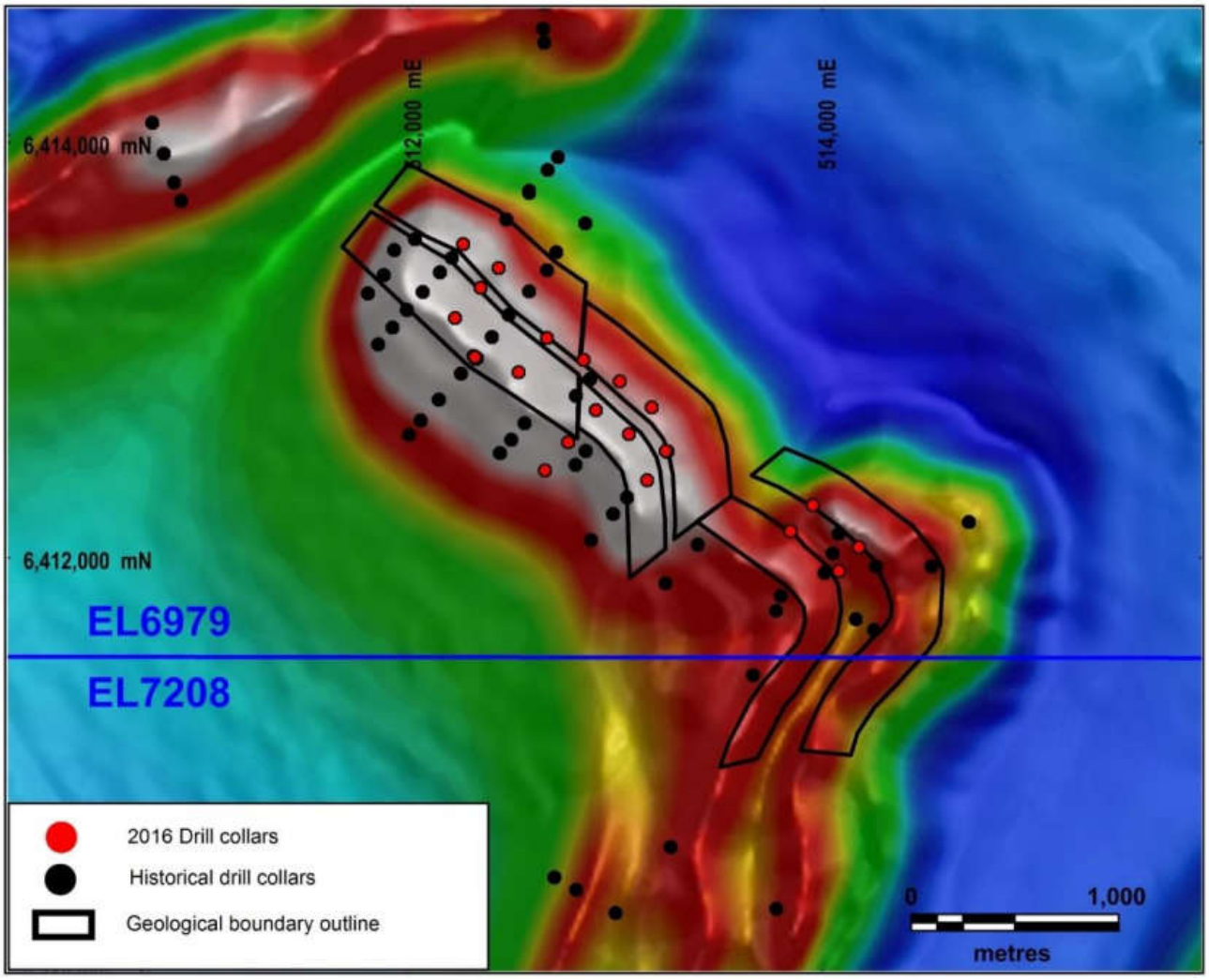


Figure 3. The Core and surrounding magnetic anomalies at Hawsons

Note – Areas shown in white correspond to high concentrations of magnetite, areas in red to moderate concentrations of magnetite and areas in green to low concentrations of magnetite. Areas in blue are barren of magnetite.

5.1.2 Resources and reserves

The Mineral Resources are reported from the June 2017 model for a 6% Davis Tube Recovery (DTR) cut off grade, with no constraints for oxidation level. The JORC 2012 compliant resource estimates were based on historical data. Recent pit optimisation studies by independent consultants KPS have now identified that 6% DTR represents a suitable cut off grade. All economic parameters used in the KPS study are consistent with those used in the PFS, with the following noted:

- Confirmed that the outer boundary of the total resource has not yet been fully identified. This means that there is still more iron ore to be drilled out within the Hawsons' tenement area, in addition to the abovementioned Mineral Resource
- Recommended and validated a reduction of the commercial cut-off grade from 9.5% recovered magnetic fraction (DTR) to 6%, significantly improving mining options and the above updated Mineral Resource
- Concluded that the economic pit shell is significantly larger than the one that was used in the Prefeasibility Study (2017)

– Determined the 10 year and 20-year pit shells (representing the required Measured and Indicated resource areas) which allows HIO to target the current drilling program to better define these areas for the BFS
– Concluded that the south-eastern pit area has shallow high-grade mineralisation (with minimal overburden). This has the potential to be a low cost and efficient entry point to mining and processing that will be assessed further following the current drilling program.

The resource estimates were produced from 73 drillholes for 21,429.5m, predominantly surface RC holes and a lessor amount of diamond drillholes (mixed HQ and NQ core sizes). Drillhole spacing ranges between 150m and 300m in both section and plan. From drilling intersections the magnetite mineralisation is interpreted to extend to a vertical depth of 400m below surface over a 4km strike length. A schematic cross section interpretation of the drilling from an earlier report is included as Figure 4. It shows the two substantial bodies of magnetite mineralisation (Units 2 and 3) with an interstitial lower grade zone known as the Interbed Unit. It is HIO's intention to mine the complete package of magnetite material, interstitial zone included. The magnetite mineralisation is considered open at depth. Additional low grade mineralisation occurs in the hanging wall which will be mined as part of any pit development.

To add further confidence in the historical resource estimates HIO commenced its confirmatory drilling program in October 2021 as part of its BFS. The BFS drilling program will provide the necessary confirmatory data to complete the various BFS study areas including:

– Resource definition (in terms of increased geological confidence and size)
– Large Diameter core samples for Pilot scale process testwork
– Geotechnical data
– Further groundwater data.

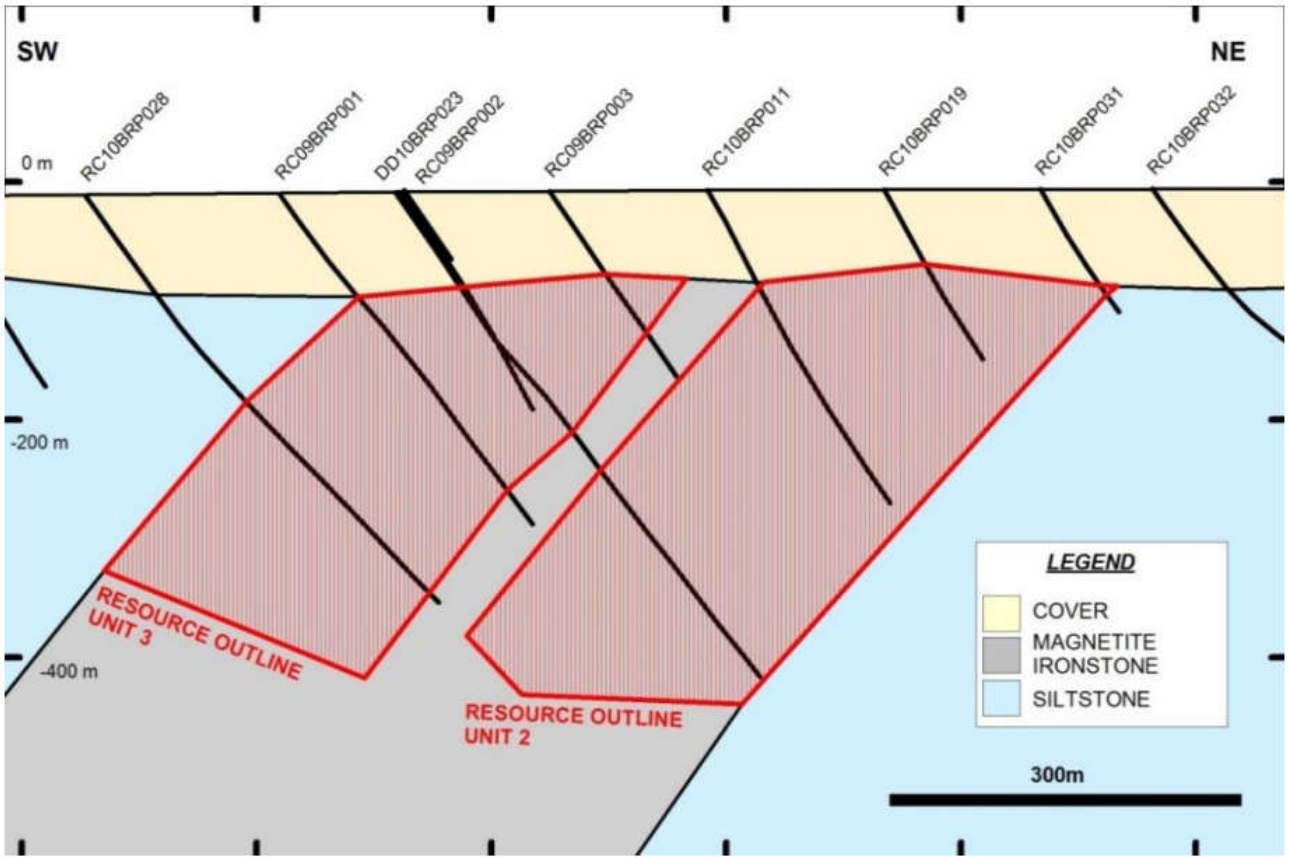


Figure 4 Schematic of the Core target

The JORC compliant estimates presented in Table 3 are reported for a 6% DTR magnetite cut-off grade constrained by the base of the oxidation surface. The resource concentrate grade is premium quality at 69.8% Fe (iron) and 2.8% SiO2 (silicon dioxide), with no other commercial impurities.

Table 3 Inferred and indicated resources

	Mt	**DTR %**	**DTR Mt**	**Fe Head %**	**Concentrate grades %**					
					Fe	Al2O3	P	S	SiO2	LOI
Indicated (including Reserves)	960	13.7	132	17.3	69.9	0.19	0.003	0.002	2.6	-3.0
Inferred	2,100	12.9	268	16.6	69.7	0.20	0.004	0.003	2.8	-3.1
Total	3060	13.1	400	16.8	69.8	0.20	0.004	0.003	2.8	-3.0

6 Operational description

The conceptual layout for the proposed mine is indicative at this stage and remains subject to minor adjustments commensurate with the findings of the EIS technical studies, ongoing metallurgical testing, and the BFS. The layout will be refined during the course of this work to address relevant environmental and operational aspects.

6.1 Mine pit and methods

6.1.1 Final pit profile

As noted above, a geological model of the resource was developed by H&SC (2017) to provide the JORC inferred and indicated resource. The indicative cross section of the Core pit is provided in Figure 5.

The ore grade does not have a distinctive cut-off point; rather, ore grades gradually decrease at the pit wall to sub-economic levels. As a result, the entire pit would be within the mineralisation. The depth of the pit required to mine the JORC compliant resource would be to approximately 500m below surface over a 4km strike length. The pit design would be refined to optimise resource recovery following further modelling during the BFS.

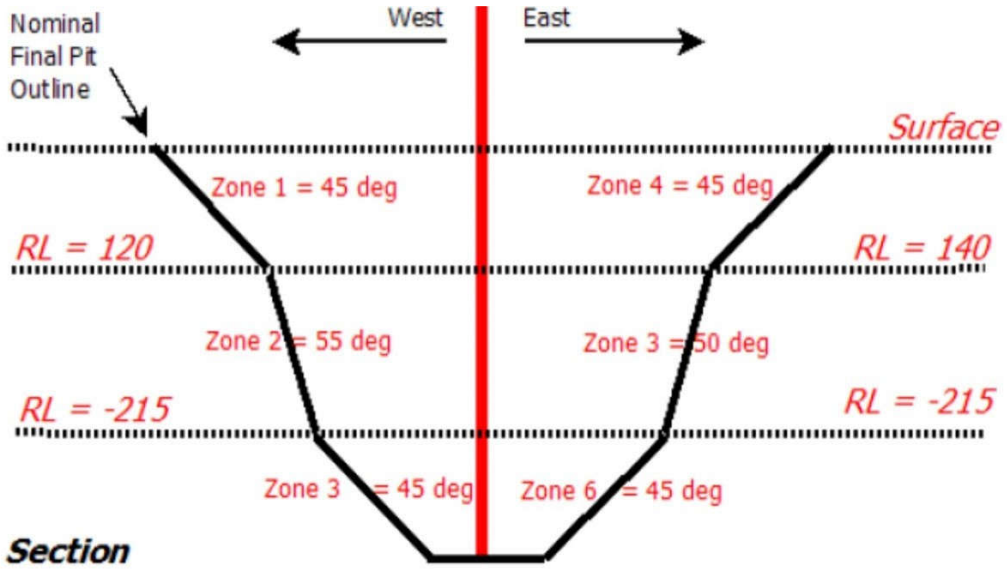


Figure 5 Indicative cross section of the final Core target pit

6.1.2 Mining methods

RoM ore would be accessed using drill and blast techniques then extracted using traditional truck and shovel mining equipment. It is anticipated that blasting would be required weekly to maintain the required production rates. An option that is being considered, is in-pit crushing and conveying, whereby the ore would be crushed in-pit and transported to the RoM pad by conveyor. The major equipment items required would include:

- Large electric rope shovels and excavators – preliminary estimates indicate that between 6 and 14 excavators would be required
- 360 tonne rear dump trucks – preliminary estimates indicate that between 52 and 86 trucks would be required
- Bulldozers
- Wheel loaders and dozers

- Graders
- Large service/water trucks
- Large rotary blast hole drills.
- In-pit crushers
- Horizontal and vertical conveyors.

Mining optimisation studies would be undertaken to refine the operation during the BFS. Pre-feasibility level studies indicated that economies of scale and reduced truck usage could be achieved by utilising in-pit crushing and conveying once the mining operation exceeds 200m in depth.

6.2 Mining and exploration titles

The project would potentially lie within and across the internal boundaries of three contiguous exploration licences (ELs) - (6979, 7208 and 7504) (refer to Figure 1). Under the NSW *Mining Regulation 2016* (Schedule 2), the ELs are Group 1 licences (base and precious metals; magnetite in particular).

Details of the exploration licences are shown in Table 4. HIO also submitted a MLA (MLA 460) on 18 October 2013 for a 187 km^2 area for the project. MLA460 is for Groups 1 and 2 minerals that extends over parts of all three ELs.

Table 4 Tenure under the *Mining Act 1992*

Title	Holder	Size (km2)	Grant Date	Expiry Date
MLA 460	HIO	187	*	-
EL 6979	HIO	179.8	11/12/2007	11/12/2021
EL 7208	HIO	289.7	22/09/2008	22/09/2020
EL 7504	HIO	40.61	08/04/2010	08/04/2020

All operational and expenditure conditions attached to the exploration licences have been met, and consequently, future renewals would be expected as per the standard provisions in the *Mining Act 1992*.

* The MLA requires the approval of the EIS prior to granting of mining lease

6.3 Mineral processing methods

The mined product would be converted into a magnetite concentrate using a process that involves the key beneficiation stages shown in Figure 6. This process was developed based on laboratory scale test work. Once the RoM ore is mined, it is stockpiled on the RoM pad to provide feed to the primary impact crushers. The RoM pad would have sufficient capacity to ensure that the process plant can continue to operate for a minimum of one day in the event of mining operational delays.

Once the RoM ore has been processed through the primary crushers, it is screened to produce three fractions; coarse, middling and fine. The coarse material would be returned to the primary crusher, while the middling fraction would be stockpiled to provide surge capacity between the mining operation and the concentrator. Fines smaller than one millimetre in diameter produced by the crushers would be wet screened and pumped to the rougher magnetic separators. The crushed ore would then be conveyed to a secondary crushing stage that would reduce the ore size to less than one millimetre diameter. The fines from the crushing circuits would then be magnetically separated in rougher magnetic separators and the concentrate would be ground in ball mills. The ball mill circuit discharge would be processed through additional magnetic separators with the non-magnetics pumped to the tailings dam.

It is expected that the final concentrate grade will be approximately 70.0 % iron. Such a premium product is likely to command high demand on global markets.

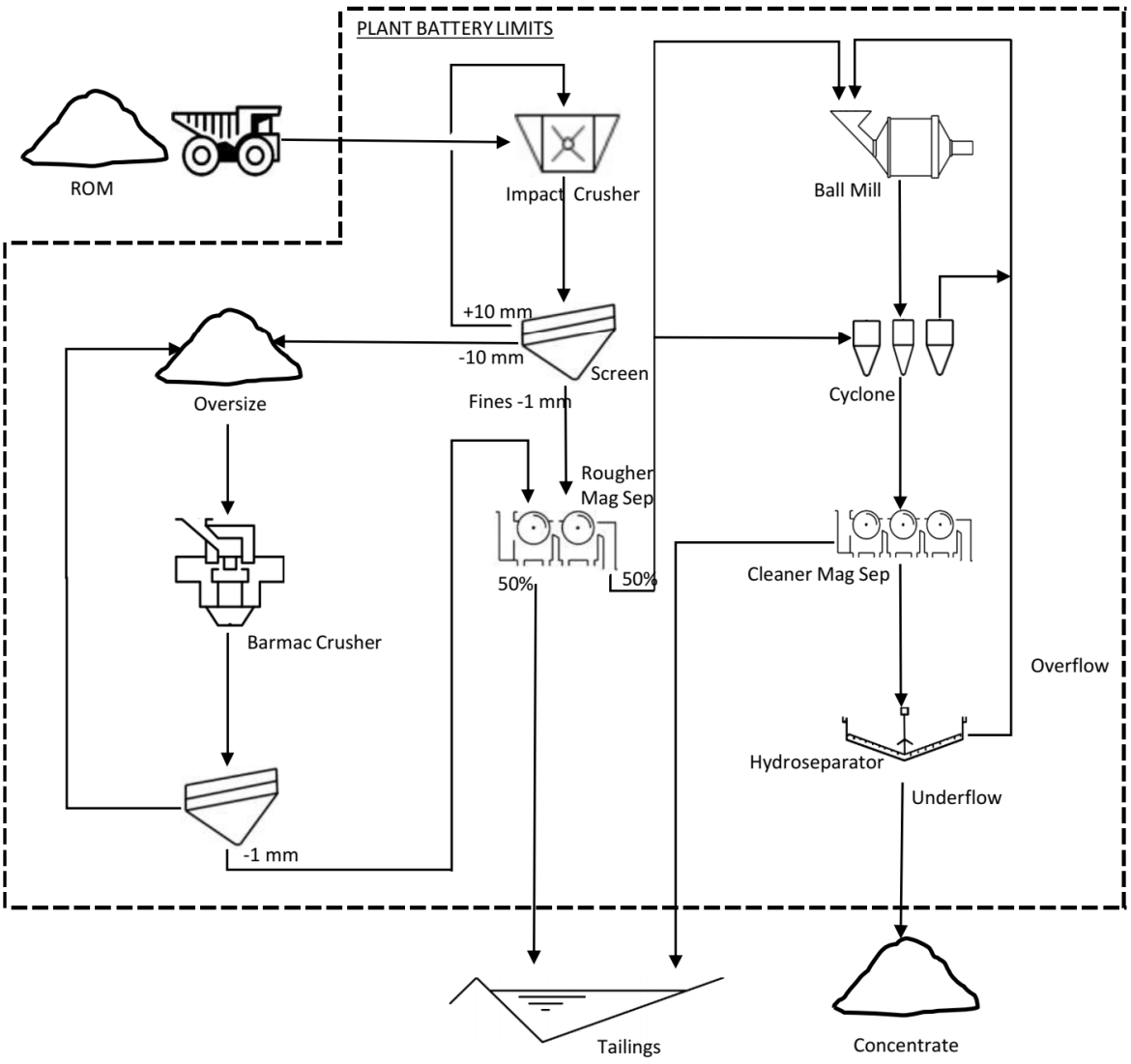


Figure 6 Process flowchart

6.4 Mine site infrastructure

6.4.1 Conceptual mine site layout

Figure 7 shows the conceptual site layout for the HIP that includes:

- An indicative maximum pit outline
- Indicative maximum waste rock dump
- TSF
- The process plant (refer to Figure 8)

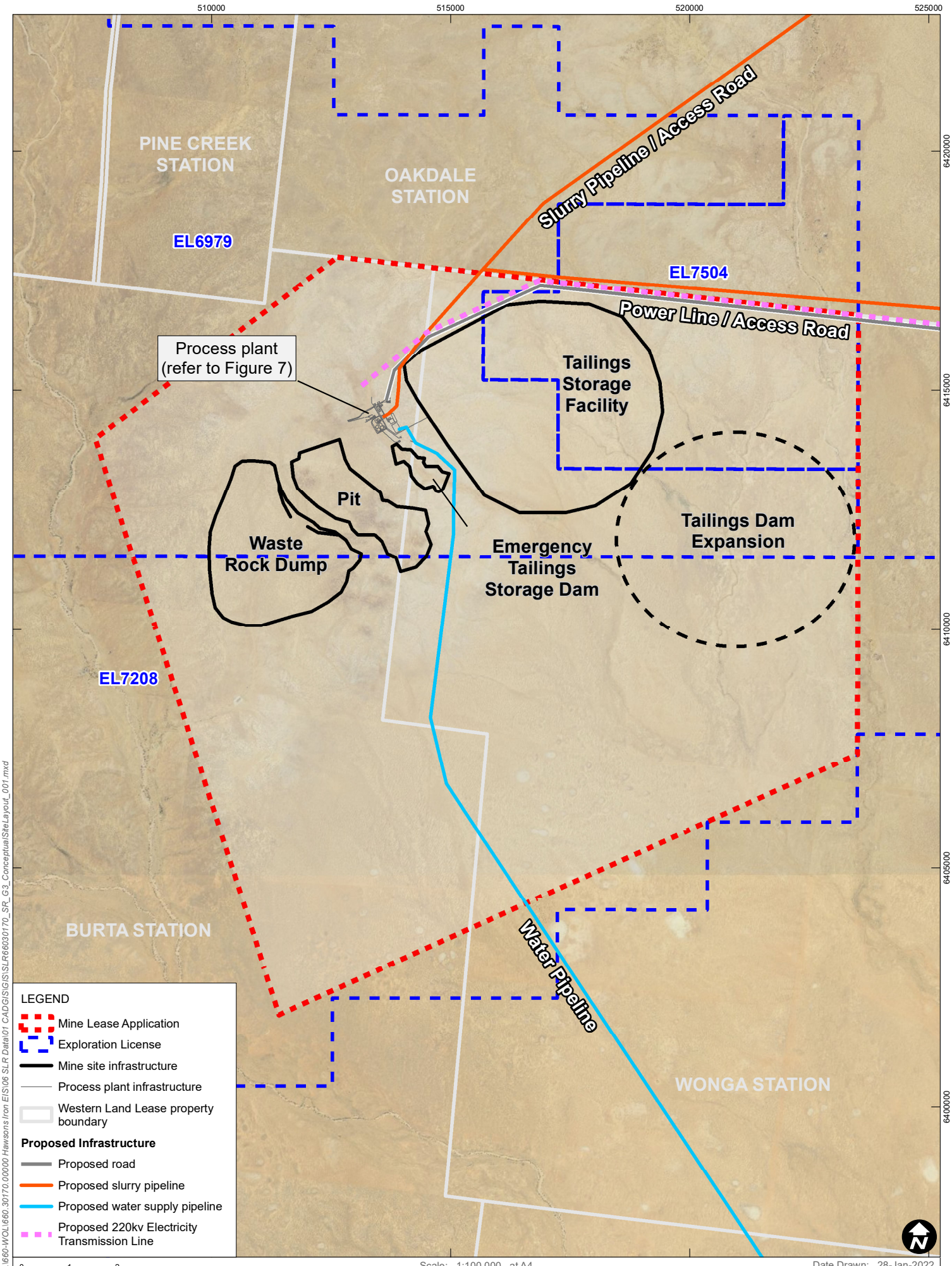
– The MIA

The conceptual site layout would be refined during the environmental impact assessment and definitive feasibility study to reduce impacts and maximise project economics.

6.4.2 Site establishment and construction

Site establishment and construction would involve activities including, though not limited to:

– Site clearing and preparation works. This would include removing existing vegetation, largely chenopods, and stockpiling topsoil for reuse during site rehabilitation
– Removing overburden and using this during the site construction
– Constructing the site access road
– Constructing the process water supply pipeline between the borefield and the mine site
– Constructing a 220 kV transmission line to link the site with the existing transmission line in the vicinity of the Silver City Highway or Broken Hill. This activity would also involve constructing a substation and associated infrastructure at the mine site
– Constructing the RoM pad, ore processing plant and associated product storage areas
– Constructing site water management structures, including the water treatment plant, storage tanks and dams
– Installing and / or constructing ancillary facilities, such as offices, workshops, hardstand areas, temporary accommodation, and other site amenities.



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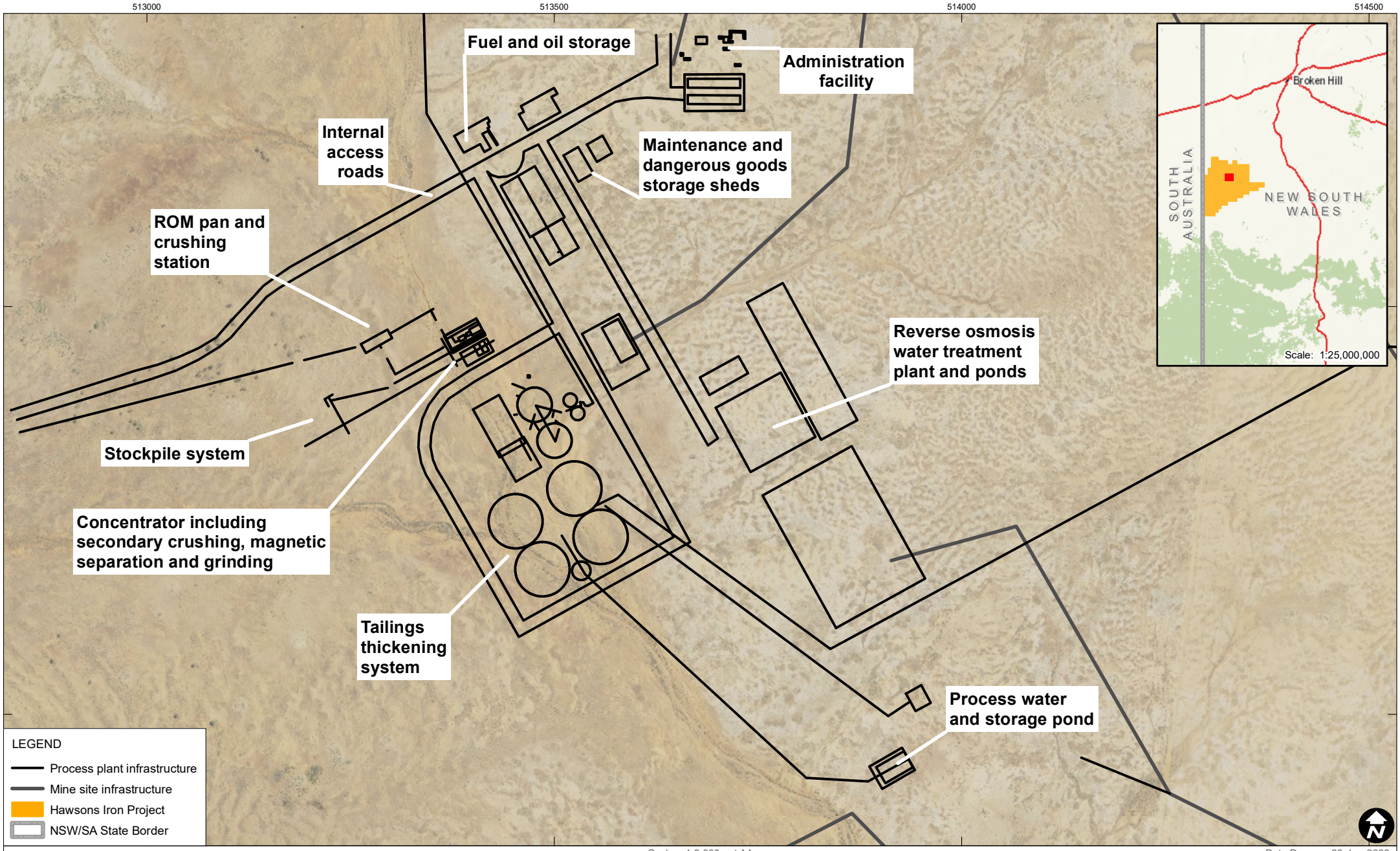
SLR

Data Source: Basedata, NSW SS, 2022
Aerial Imagery © Department of Customer Service 2020
Proposed Infrastructure digitised from Hawsons Iron Project (GHD, August 2019).
Proposed Infrastructure accuracy limitation - data not appropriate for large scale maps (<1:50,000)

CONCEPTUAL SITE LAYOUT

FIGURE 7



Data Source: Basedata, NSW SS, 2022
Aerial Imagery © Department of Customer Service 2020
Proposed Process plant infrastructure digitised from Hawsons Iron Project (GHD, August 2019).
Proposed Process plant infrastructure accuracy limitation - data not appropriate for large scale maps (<1:5000)

CONCEPTUAL LAYOUT OF THE MINE PROCESS INFRASTRUCTURE

FIGURE 8

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6.5 Mine waste management

6.5.1 Waste material dumps

Waste material generated through overburden stripping and mining that is not beneficially used on site to construct the TSF wall or other facilities would be stored on site. Figure 7 provides indicative locations for the proposed waste material dumps that would be progressively contoured and rehabilitated over the proposed mine life.

Preliminary geochemical assays suggest there is a low risk for the waste material to generate acid. Preliminary analysis indicate that the ore and the tailings contain carbonates in the form of dolomite (CaMg(CO3)2). Acidification of the tailings is very unlikely to occur due to the inherent buffering capacity of the minerals and low total sulfur content in the mineral waste of less than 0.01%, indicating a low acid generation potential. The predominant mineralogy is magnetite, dolomite and silicates, with only traces of sulfides present in the samples. The relatively inert chemistry of the waste material would be confirmed by undertaking a mineral waste geochemical assessment during the EIS.

6.5.2 Tailings storage facility

The TSF would be designed to minimise water loss and the current design has assumed that the tailings would be placed at a maximum lift rate of 2.5 metres per year. This lift rate is considered to be conservative and allows for sufficient drying time of the tailings. Settling tests have indicated that tailings can be thickened to 70% solids prior to pumping to the TSF. Initial calculations indicate that this strategy would save approximately 30% of the water that would otherwise enter the TSF.

Options being considered for tailings storage are:

- Option 1 - A single cell TSF with a central decant pond. This would require construction of a perimeter embankment with a central causeway to provide access to the central decant pond. Tailings deposition would be by way of a perimeter ring main and spigots, and extensions to the spigots could be installed to deposit tailings closer to the centre of the TSF to control beach formation;
- Option 2 - A multiple cell TSF with a central decant pond in each cell. This would be similar to the single cell option except that the overall storage would be separated by a series of internal embankments to create separate cells. Each cell would have its own central decant pond with a decant line draining to a central trunk main;
- Option 3 - A single cell circular TSF with a central thickened discharge (CTD). A CTD type facility operates by pumping thickened tailings to central discharge towers that deposit tailings and allow them to spread to the outside of the facility. Operation of these types of storages requires significant pumping infrastructure, and typically require greater surface area, as the tailings spread following deposition. The advantage is that these facilities require less substantial earthworks, aside from a water retention pond on the outside of the facility; or
- Option 4 - Combined single cell with perimeter discharge (PTD) and CTD. This option is a combination of Options 1 and 3 with the advantage of the central discharge to improve the efficiency of storage but still limiting the overall footprint. The area selected is based on the 2.5 metre average annual placement rate. A circular drain is developed by discharge from both the perimeter and the central area. The perimeter discharge allows use of upstream construction.

The TSF design would be refined and optimised though the BFS.

6.5.3 Non-process infrastructure

The project would require ancillary utility infrastructure such as those required to provide site access and meet water, electricity and communication demands. Investigations are ongoing to confirm utility requirements and identify infrastructure corridors, with these being refined during the BFS. This process would involve route options analysis to identify potential constraints and opportunities to minimise environmental and social impacts where possible. It would also consider stakeholder / landholder consultation, and cost effectiveness. Where it is feasible, practical and safe,

infrastructure could be co-located within common corridors.

6.5.4 Site access and internal road network

Access to the project site is currently via the Silver City Highway approximately 60 kilometres south of Broken Hill and then 30 kilometres west from the highway via several pastoral stations (refer to Figure 1). During the BFS a suitable location for the site access will be identified and will be constructed to relevant guidelines and standards that will allow the mine to operate on a drive-in drive-out basis, with operational staff to be based in Broken Hill and surrounds.

A network of internal roads and designated parking and loading areas would also be constructed. This network would be designed to comply with relevant guidelines and standards.

6.5.5 Project water supply

The water demand for current processing is estimated to be approximately 470 litres of water per metric tonne of RoM ore. It is estimated that the project would require approximately 40 gigalitres (GL) of water per annum for use in the processing plant. In consultation with key government stakeholders, water supply options have been investigated, along with technology to reduce water usage. As part of the BFS, refinement of the onsite water strategy is progressing and looking into alternate water sources that may be available to the project.

The current identified water source for the operating mine is a borefield located in the Lower Renmark Aquifer near Coombah; approximately 95 kilometres south of the mine site. The Lower Renmark Aquifer contains saline groundwater with total dissolved solids (TDS) concentrations of around 13,800 mg/L. If utilised it is proposed to pump the saline water from the borefield to an earthen storage dam located at the project site. Given the salinity of the water, the deep aquifer water is unusable for agricultural purposes and the regional impacts are beneficial to the environment (GEO-ENG, 2021). Based on a hydrogeological assessment undertaken by Geo-Eng for HIO (Geo-Eng 2016), the borefield would comprise a series of bores located one kilometre apart between Woolcunda Lake and Salt Lake, just west of Coombah. Booster pumps are likely to be required to deliver water from the bore head to the main pipeline.

The raw water would then be distributed either directly to the RoM ore processing plant, or to a reverse osmosis treatment plant. The treated water would then be used for final product washing, slurry transport, and potable water. Brine from the treatment plant would be piped to the tailing thickener and then recycled in the processing plant.

Potable water demands on site would be minimal, and required only for uses such as staff amenities, flocculent / reagent make up, drinking water, and safety showers.

The Natural Resources Access Regulator (NRAR) would be consulted to assist in the evaluation of water supply options during the EIS and BFS, and where needed a licence would be obtained under the *NSW Water Management Act 2000* to extract groundwater.

6.5.6 Electricity supply

The project would require power to the site primarily for the beneficiation plant, water treatment plant and administration buildings. The pumps within the borefield, would also need to be connected to the electricity network. An initial feasibility study by TransGrid indicates that there is scope to upgrade the existing electricity network to supply the power required for the project. Standby diesel generators would be installed on site to augment the network power supply and provide emergency contingency backup power if required. This emergency backup system may also be used to pump out non-gravity systems. HIO will continue to consult with TransGrid (as the asset owner) and Essential Energy (as the electricity provider) to confirm power infrastructure requirements and locations. The design and requirements for the power supply will be optimised during the BFS and will include further investigation into available renewable power sources

6.5.7 Ancillary facilities

The project would require a range of ancillary facilities, including though not limited to:

- Site administration and amenity buildings
- Workshops and storage facilities
- Temporary accommodation during construction
- Communications and data infrastructure
- Sewage treatment facilities
- Resource transport infrastructure.

Further details regarding these facilities would be available as the engineering design and BFS progresses. Figure 1, Figure 7 and Figure 8 show the indicative locations and layouts of these ancillary facilities.

6.6 Transport of magnetite concentrate

HIO are still investigating transport options for the magnetite concentrate to port. This will be further refined during the BFS, though the current favourable option is a slurry pipeline to a port in South Australia. The final concentrate would be thickened and pumped through a slurry pipeline. The slurry would use make-up water and the magnetite product would then be transported to the port and the filtrate water would be returned to the mine site via a return water pipeline located adjacent to the slurry pipeline. The return water would be reused at the mine site to reduce overall water demand.

6.7 Rehabilitation, landform and final land use

The HIP is in flat, semi-arid, chenopod country within two Western Land Lease properties; Burta and Wonga. The two properties have operated as sheep stations for over a century.

The waste storage facility would be progressively contoured and rehabilitated over the life of operations to minimise the disturbance footprint.

The TSF has the potential to contain salts from the saline process water. Evaporation is proposed as the preferred management strategy to minimise the risk of saline drainage over the life of operations.

The final pit void would accumulate water from rain and surface runoff, though is unlikely to entirely fill due to the high evaporation rate, low rainfall in the region and expected low groundwater recharge rates.

HIO would implement a rehabilitation program to best integrate the final landform into the surrounding topography, where practicable. This would aim to provide a low maintenance, physically and chemically stable landform that is able to sustain appropriate vegetative cover.

In addition to mine site rehabilitation, all linear infrastructure corridors would be decommissioned and rehabilitated consistent with stakeholder consultation and statutory requirements. Where practicable, areas of the site hosting linear infrastructure would be rehabilitated to pastoral rangelands. All decommissioning and rehabilitation would be consistent with an approved Rehabilitation Management Plan (RMP), which will be prepared and submitted to the Resources Regulator for approval prior to commencing mining.

6.8 Hours of operation

The project is a large scale mining operation and would operate 24 hours per day, seven days per week.

6.9 Mine schedule and project life

Figure 3 shows the additional magnetite mining targets around the Core anomaly. The project would initially mine the resource at the Core anomaly though further exploration drilling would be undertaken on the other mineralised areas to

develop resource and reserve estimates in accordance with the JORC Code. It is likely that sufficient resource is present to enable the project to continue to produce 20 Mtpa of magnetite concentrate for a period in excess of the 20 years.

It is anticipated that mine construction would take approximately two years, inclusive of removal of the overburden. Additional overburden would be removed throughout the mine life as part of normal operations.

Indicative production schedules would be developed and refined as additional modelling is undertaken to optimise ore recovery. This would involve identifying a preferred staging scenario and associated pit shell plans.

7 Stakeholder engagement

7.1 Stakeholder engagement strategy

7.1.1 Overview

A Stakeholder Engagement Strategy was prepared in 2012 to guide consultation for the project and has been progressively updated. The purpose of the strategy is to identify the main stakeholders who are likely to have an interest in the project. It provides structure and outlines an identified stakeholder strategy for the project. The engagement strategy was developed based on a good understanding of the overall project objectives, key requirements of the approvals phase and the identified interests of project stakeholders.

The engagement strategy has been prepared as a document that remains dynamic throughout the project approvals period and beyond. As such, the strategy will be updated as the project evolves.

The engagement approach has been guided by the Core Values and Code of Ethics of the International Association for Public Participation (IAP2).

7.1.2 Objectives

The following stakeholder engagement objectives have been developed with an understanding of the overall project objectives and the likely challenges for the approvals phase of the project.

- Capture and collate HIO's broader project stakeholders and identify their key interests/issues so that HIO can proactively engage with them throughout the project.
- Consult with stakeholders to clarify aspects of the project that are fixed and those aspects that could be modified to reduce potential impacts and/or address stakeholder concerns.
- Provide timely and factual information in plain English that is relevant to the target audience.
- Provide an efficient engagement process that assists educating stakeholders about the project and limit risk of project rumour and speculation.
- Work with stakeholders to identify potential impacts so that concerns can be managed or mitigated and the positives enhanced.
- Strengthen new and existing relationships with landowners potentially affected by linear infrastructure.
- Assist with the overall land access strategy.
- Ensure that the community consultation aspects of the SEARs for the EIS are completed.

7.2 Consultation activities

HIO has undertaken a range of consultation activities during previous phases of the project between 2010, 2019, 2021 and 2022. This includes briefing relevant NSW and South Australian government agencies and liaising with the two parties that hold Western Lands Leases upon which the proposed mine site is located. Leaseholders along the infrastructure corridors were also consulted from 2014 to 2022 to arrange site access for field investigations. As the approvals process progresses, consultation will be required with additional stakeholders including all landholders and leaseholders affected by infrastructure corridors and the broader community.

To ensure that stakeholders are engaged effectively, HIO would continue to implement the stakeholder engagement strategy and plan as it outlines the communications and consultation processes to be implemented during the pre-construction, construction, operational, decommissioning, and rehabilitation stages of the project. The strategy and plan would assist HIO to accurately inform and consult stakeholders about the scope and duration of works, in addition to providing advice on opportunities to minimise potential impacts of the project.

7.2.1 Agency and government consultation

While preparing the Hawsons Prefeasibility Study (GHD 2017) and Preliminary Environmental Assessment (PEA) (GHD 2017), HIO briefed the following government agencies on the project:

- The NSW DP&E formerly the NSW Department of Planning
- The NSW Department of Trade and Investment – Division of Resources & Energy (T&I-RE) – formerly the NSW Department of Industry and Investment – Division of Mineral Resources
- NRAR
- Transport for NSW (TfNSW)
- NSW Department of Primary Industries: Catchments & Lands (Western Lands leases)
- The NSW Environment Protection Authority (EPA)
- TransGrid
- Broken Hill City Council
- The South Australian Government (EPA, DUNA, DPTI, IASA ect)
- Australian Rail Track Corporation (ARTC)

Other agencies and stakeholders that have been briefed include:

- Flinders Ports
- Genesee Wyoming Australia
- SA Magnetite Strategy Steering Committee.

Briefings included discussions regarding design requirements and to confirm expectations regarding the scope of environmental impact assessments that will be undertaken for the EIS. This also provide an opportunity to discuss the status and preliminary findings of investigations associated with the EIS that have commenced.

8 Planning and assessment process

8.1 Environmental Planning and Assessment Act 1979

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) is the core legislation relating to planning and development activities in NSW. It is the principal law overseeing the assessment and determination of development proposals. All development in NSW is assessed in accordance with the provisions of the EP&A Act.

8.1.1 Part 4 of the EP&A Act

Part 4 of the EP&A Act provides for the control of development that requires development consent from a consent authority. Part 4, Division 4.7 of the EP&A Act establishes an approval regime for development that is declared to be State significant development by either a State Environmental Planning Policy (SEPP) or Ministerial Order. In accordance with section 4.38 of the EP&A Act, the Minister for Planning and Homes is the consent authority for State significant development. Pursuant to clause 8 of section 4.12 of the EP&A Act, an EIS is required to support a development application for State Significant Development. The EIS would be placed on public exhibition to allow public and agency submissions to be lodged, after which the proponent maybe requested to respond to issues raised in the submissions.

State Significant Development to which Division 4.7 of the EP&A Act applies is identified in the State and Regional Development SEPP (2011) and in declarations made by the Minister for Planning. The project is considered to be 'State Significant Development' as it is of a type listed in Schedule 1 of the State and Regional Development SEPP.

8.1.2 Approvals that do not apply or need to be applied consistently

Section 4.41 of the EP&A Act specifies certain authorisations which are not required for State Significant Development that is authorised under a development consent. These include the following authorisations, which may otherwise have been relevant to this project:

– NSW *Fisheries Management Act 1994* – permit for work or structures within a waterway
– NSW *National Parks and Wildlife Act 1974* – an Aboriginal heritage impact permit under Section 90
– NSW *Water Management Act 2000* – water use approval, water management work approval or activity approval.

These approvals would not be required if the Minister grants development consent to carry out the project under Division 4.1 of Part 4 of the EP&A Act.

Under Section 4.42 of the EP&A Act, the following approvals relevant to this project cannot be refused if necessary for the carrying out of an 'approved project' and are to be substantially consistent with an approval to carry out the project given under Part 4:

– A mining lease under the *Mining Act 1992*
– An environment protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997*
– Consent under section 138 of the *Roads Act 1993.*

8.2 Environmental planning instruments

Environmental planning instruments (EPIs) are legal documents that are prepared under the EP&A Act to regulate land use and development. EPIs determine the relevant Part of the EP&A Act under which a development proposal must be assessed and therefore determine the need or otherwise for development consent. EPIs consist of SEPPs and local environmental plans (LEPs).

8.2.1 State environmental planning policies

State Environmental Planning Policy (State and Regional Development) 2011

The State and Regional Development SEPP identifies development:

– To which the State significant development assessment and approval process under Part 4 of the EP&A Act applies
– That is State significant infrastructure and critical State significant infrastructure.

Development that is specified in Schedule 1 or Schedule 2 is declared to be State significant development. Clause 5(1) of Schedule 1 states that the following development is State significant development:

Development for the purpose of mining that:

a) is coal or mineral sands mining, or

b) is in an environmentally sensitive area of State significance, or

c) has a capital investment value of more than $30 million.

The project has a capital investment value in excess of $30 million and is therefore defined as State significant development under Clause 5(1) of Schedule 1 of the State and Regional Development SEPP.

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

The State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (the Mining, Petroleum Production and Extractive Industries SEPP) aims to "establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources".

Part 3 of the Mining, Petroleum Production and Extractive Industries SEPP identifies matters for consideration in the assessment of development applications for mining, petroleum production and extractive industries. Under Part 3, the consent authority has to consider the following matters and these would be addressed in the EIS:

– Non-discretionary development standards
– Compatibility of the proposed mine with other land uses
– Consideration of voluntary land acquisition and mitigation policy
– Compatibility of proposed development with mining
– Natural resource management and environmental management
– Resource recovery
– Transport
– Rehabilitation.

State Environmental Planning Policy (Infrastructure) 2007

The State Environmental Planning Policy (Infrastructure) 2007 (the Infrastructure SEPP) aims to facilitate the effective delivery of infrastructure across the State through increased regulatory certainty and improved efficiency and flexibility in the location of infrastructure and service facilities, while also providing for adequate stakeholder consultation.

Part 3 of the Infrastructure SEPP defines development controls for 25 types of infrastructure works and includes matters that a consent authority must consider in assessing development adjacent or in close proximity to certain types of infrastructure.

The EIS would address relevant clauses of the Infrastructure SEPP by assessing the potential impacts of the project on

nearby infrastructure, including electricity transmission or distribution network (Division 5), Railways (Division 15),and road or rail corridors (Division 17).

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

The State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) requires developers and consent authorities to assess the hazards and risks associated with a proposed development before approval is given for construction and operation.

Under SEPP 33, a potentially hazardous industry means a development for the purposes of any industry which, if the development were to operate without employing any measures to reduce or minimise its impact, would pose a significant risk to human health, life or property, or to the biophysical environment. SEPP 33 requires developments that are potentially hazardous to have a preliminary hazard analysis (PHA) prepared to determine the risk to people, property and the biophysical environment at the proposed location and in the presence of controls.

Development that requires an environment protection licence (EPL) from the NSW EPA under the *Protection of the Environment Operations Act 1997* (POEO Act) is considered to be potentially offensive. However, the level of offence is not considered to be significant if the EPL can be obtained.

Section 6.3.1 reflects that the proposal requires an EPL and is therefore considered to be a 'potentially offensive industry'. If the NSW EPA considers that the proposal can be issued with the required EPL, it would not be considered an offensive industry, and the requirements of SEPP 33 in terms of offence would be met. The EIS, would consider whether the project is considered potentially hazardous and this would involve preparing a PHA.

State Environmental Planning Policy (Primary Production and Rural Development) 2019

The State Environmental Planning Policy (Primary Production and Rural Development) 2019 (the Rural Development SEPP) aims to facilitate the orderly and economic use and development of rural lands for rural and related purposes. Part 2 of the Rural Development SEPP provides for the designation of state significant agricultural land under Schedule 1, however no land had been declared under Schedule 1 when this planning instrument was reviewed (May 2019).

The mine site is located on rural land which incorporates two pastoral leases, and the infrastructure corridors would pass through additional rural properties. The EIS would assess the impacts of the project on rural and agricultural land with consideration to the rural planning principles contained within the Rural Development SEPP.

State Environmental Planning Policy No. 55 – Remediation of Land

The aims and objectives of State Environmental Planning Policy No. 55 (SEPP 55) are to provide a state-wide planning approach to contaminated land remediation and to promote the remediation of contaminated land to reduce risk of harm. SEPP 55 restricts consent authorities from issuing development consent on land that may be contaminated, unless the consent authority is satisfied that the land in question is suitable for development, or would be suitable if the appropriate remediation was undertaken.

The mine site and majority of the associated infrastructure corridors have a history of use for grazing and this land use is unlikely to have contaminated the site. The aims and objectives of SEPP 55 would be considered in the EIS and the potential for the site to be contaminated would be assessed.

8.2.2 Local planning instrument

The site is located wholly within the 'Unincorporated Far Western Region' area of NSW. The Far West region consists of eight local government areas: Balranald, Brewarrina, Bourke, Broken Hill, Central Darling, Cobar, Walgett and Wentworth. The Unincorporated Area is also located within the Far West region. As such, it is not within a local government area and there is no applicable Local Environmental Plan.

The Far West Regional Plan 2036 is the NSW Government's strategy for guiding land use planning decisions for the Far West Region for the next 20 years. The Regional Plan sets out three goals for the Far West Region:

– A diverse economy with efficient transport and infrastructure networks
– Exceptional semi-arid range lands traversed by the Barwon-Darling River
– Strong and connected communities.

8.3 Other applicable legislation

8.3.1 State legislation

Mining Act 1992

The NSW *Mining Act 1992* (Mining Act) places controls on exploration and mining, the disposal of mining waste, land rehabilitation, and certain environmental activities as they pertain to mineral extraction. Under the Mining Act, a mining lease is required before any mining can take place. Mining leases are granted after approval has been obtained under the EP&A Act. A mining lease is granted for period of up to 21 years and the lease may be renewed, subject to approval.

HIO has applied for a mining lease. The mining lease would be approved after the project has been granted consent under the EP&A Act. The mine would then be operated in accordance with this licence and its conditions once granted.

Protection of the Environment Operations Act 1997

The NSW *Protection of the Environment Operations Act 1997* (POEO Act) establishes, amongst other things, the procedures for issuing of licences for environmental protection on aspects such as waste, air, water and noise pollution control. The owner or occupier of premises engaged in scheduled activities is required to hold an EPL and comply with the conditions of that licence.

Scheduled activities are identified in Schedule 1 of the POEO Act. The project would be a scheduled activity under:

– Clause 27 – mineral processing meaning processing, or commercial production or extraction, of ore (using methods including chemical, electrical, magnetic, gravity or physical-chemical). A mineral processing facility that has the capacity to process more than 150 tonnes per day is a scheduled activity
– Clause 29 –mining for minerals meaning the mining, processing or handling of minerals (within the meaning of the NSW Mining Act 1992), other than coal, at mines. A mining activity is a scheduled activity if it has disturbed, is disturbing or will disturb a total surface area of more than four hectares of land (or, in the case of a gold mine, more than one hectare of land) by:
    - clearing or excavating, or
    - constructing dams, ponds, drains, roads, railways or conveyors, or
    - storing or depositing overburden, ore or its products or tailings.

The project would be a scheduled activity and require an EPL under the POEO Act.

Pursuant to Section 4.42 of the EP&A Act, an EPL cannot be refused if necessary for the carrying out of State significant development that is authorised by development consent. The EPL would be required to be substantially consistent with the consent.

Water Management Act 2000

The NSW *Water Management Act 2000* is administered by – Water NSW and NRAR and applies to all water resources declared to be a part of the State. It applies to water resources for which a Water Sharing Plan (WSP) has been gazetted. Under the *Water Management Act 2000*, a permit is required to extract water, unless an exemption is available.

The project would involve extracting groundwater from the Lower Renmark Aquifer which is covered by the NSW Murray-

Darling Basin Porous Rock Groundwater WSP. It would require a range of activities that meet the definition of activities requiring approval under the *Water Management Act 2000*, including:

- Water access license – Section 56 of the *Water Management Act 2000*
- Water use approval – Section 89 of the *Water Management Act 2000*
- Water management work approval – Section 90 of the *Water Management Act 2000*
- Controlled activity approval (includes aquifer interference approvals) – Section 91 of the *Water Management Act 2000*.

The application of the WSP and project would be considered during preparation of the EIS.

If the project is granted consent under the EP&A Act, the water supply work approvals, water use approvals and activity approvals for controlled activities would not be required due to the application of Section 4.41 of the EP&A Act. The water access licence would be required for water supply and for pit dewatering as applicable.

Roads Act 1993

The NSW *Roads Act 1993* (Roads Act) provides the statutory framework for the management of public roads within NSW. The Roads Act is administered by TfNSW, councils or the DPI&E - Lands. TfNSW has jurisdiction over major roads, councils over minor roads and the Department of Lands over road reserves or Crown roads.

Section 138 of the Roads Act requires that a person obtain the consent of the appropriate roads authority to erect a structure, or carry out a work in, on or over a public road, or dig up or disturb the surface of a public road.

As identified above, construction of the project would require works within public road reserves to connect the mine site to the existing road network. Consent of the appropriate roads authority under Section 138 of the Roads Act would be required for any works within a public road.

The proposal would have the potential to impact upon roads managed by TfNSW and therefore approval would be required from TfNSW. There is potential for impacts to other roads and approval would be required from the relevant authority. Under Section 4.42 of the EP&A Act, a permit under Section 138 of the Roads Act cannot be refused if necessary for the carrying out of State significant development that is authorised by development consent. The permit is required to be substantially consistent with the consent.

Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides the process for listing threatened species, threatened ecological communities and areas of outstanding ecological value, and details the process for assessing impacts on those matters.

A preliminary ecological assessment has been undertaken to identify potential issues for the project. The results of this assessment are summarised below. A full ecological impact assessment would be undertaken as part of the EIS.

National Parks and Wildlife Act 1974

The NSW *National Parks and Wildlife Act 1974* (NPW Act) aims to protect native flora and fauna, and the integrity of any Aboriginal heritage items in NSW. It also provides for the protection of National Parks, Historic Sites, Nature Reserves, State Recreation Areas, Regional Parks, Designated Wilderness, Karst Conservation Sites and State Game Reserves.

A Section 90 Aboriginal heritage impact permit under the NPW Act is not required for approved State significant development. Nonetheless, an indigenous heritage assessment would be undertaken as part of the EIS.

Crown Lands Management Act 2016

The project would be located on Crown land that is managed by the DPE – Crown Land. The land is currently leased for grazing purposes. The leases were issued under the *Western Lands Act 1901* which was repealed in 2016 and replaced by the *Crown Lands Management Act 2016*. Leases issued under the *Western Lands Act 1901* continue to have effect under

the *Crown Lands Management Act 2016*.

Under the *Crown Lands Management Act 2016*, a licence to remove minerals to which the *Mining Act 1992* applies cannot be granted over Crown land unless the Minister administering the *Crown Lands Management Act 2016* has given approval for it. A Crown Lands Licence would need to be obtained to authorise the occupation over the affected land tenures for any aspects of the project which are located outside the area to be covered by a future mining lease.

The ancillary infrastructure corridors would likely not be covered by the mining lease and a Crown Lands Licence is likely to be required for these works if they impact on Crown land. The DPE – Crown Land would be consulted during preparation of the EIS to confirm licencing requirements.

8.3.2 Commonwealth legislation

Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth EPBC Act prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas and species, populations and communities, and heritage items. The approval of the Commonwealth Minister from the Department of Agriculture, Water and the Environment is required for:

- An action which has, would have or is likely to have a significant impact on matters of national environmental significance (NES matters); and
- An action likely to have a significant impact on the environment in general (for actions by Commonwealth agencies or actions on Commonwealth land) or the environment on Commonwealth land (for actions outside Commonwealth land).

An 'action' is considered to include a project, development, undertaking, activity or series of activities. NES matters include:

- World heritage areas
- National heritage places
- Wetlands of international importance (i.e. Ramsar wetlands)
- Nationally listed threatened species and ecological communities
- Listed migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions
- A water resource, in relation to coal seam gas development and large coal mining development.

Native Title Act 1993

The objectives of the *Native Title Act 1993* are to:

- Recognise native title rights and sets down basic principles in relation to native title in Australia
- Provide for the validation of past acts which may be invalid because of the existence of native title
- Provide for a future regime in which native title rights are protected and conditions imposed on acts affecting native title land and waters
- Provide a process by which native title rights can be established and compensation determined, and by which determinations can be made as to whether future grants can be made or acts done over native title land and waters
- Provide for a range of other matters, including the establishment of a National Aboriginal and Torres Strait Islander Land Fund.

The mine site is located on land that is subject to Western Land Lease and native title has been extinguished on this land.

Land ownership would be reviewed along the infrastructure corridors to determine whether the project would impact on any Crown land that is subject to the *Native Title Act 1993*.

9 Preliminary environmental assessment

A preliminary environmental and social risk assessment was undertaken to identify key issues for the project. This involved reviewing the project's construction, operational, decommissioning and rehabilitation stages to identify:

- Potential environmental and social risks and / or impacts
- Potential environmental and social consequences associated with the risk and / or impacts.

The environmental and social risk assessment aimed to identify and prioritise the key environmental and social disciplines that will require assessment in the EIS. It focused on the area within HIO's exploration licences, in particular the Core target area, as the mine, ore processing infrastructure and mine waste infrastructure would be constructed and operated in this locality. Further environmental risk assessments would be undertaken as part of the EIS to confirm the most appropriate locations for the ancillary infrastructure corridors. This process would involve identifying environmental and social constraints and opportunities and implementing design measures to avoid or otherwise minimise potential environmental and social impacts, where practicable.

HIO has either completed or commenced a range of tasks undertaken to address the historic DGRs and SEARs to optimise the project and obtain baseline information for the EIS. These investigations include:

- Ecology, Indigenous and historic heritage surveys within the proposed mine site and along the majority of the infrastructure corridors. These studies have assisted to identify potential constraints that will be used to refine the project where feasible to minimise impacts, where practical
- Groundwater monitoring and pump tests. This has provided information on the capacity of the aquifer to provide a sustainable water source for the project
- Ambient air quality monitoring
- Engineering investigations to optimise the layout of the processing plant and fine-tune options for the infrastructure corridors
- Consultation with landholders that have the potential to be affected by the proposed project.

This baseline information would be referenced when preparing the EIS to address the SEARs.

Based on the assessment undertaken to date, historic DGRs and SEARS and the (then) DPIE scoping worksheet (refer to Appendix A), the proposed environmental assessments of the key environmental aspects that will be further assessed in the EIS comprise:

- Ecology – Terrestrial and Aquatic
- Surface water
- Groundwater
- Traffic and Transport
- Indigenous Heritage
- Historic Heritage
- Land Resources
- Hazard and Risk
- Social
- Economic
- Noise and Vibration

- Air Quality
- Greenhouse Gas
- Contaminated Land
- Landscape, Visual and Lighting
- Waste
- Bushfire
- Rehabilitation.

The key environmental and social disciplines are discussed below.

9.1 Groundwater and hydrogeology

9.1.1 Existing environment

The mine site is situated on the boundary of the Murray Geological Basin and the Fractured Rock Aquifer system. The Adelaide Fold Belt sequences form a fractured rock aquifer where groundwater is stored and transmitted through the fractures and fissures within the rock. The rocks are hard and impermeable, with the porosity and permeability of the rock being generally low. The water is very saline and yields are typically less than 0.5 L/s. This aquifer forms part of the Adelaide Fold Belt Groundwater Management Unit.

The Murray-Darling geological basin exists to the south of the mine site in the vicinity of the borefield. Near borefield site, the Late Tertiary to Quaternary sediments are described as low yielding with groundwater salinity. A Water Sharing Plan commenced for the Murray-Darling Basin Porous Rock Groundwater Sources on 16 January 2012 and this subdivides the Murray-Darling Basin into several regions, including the Western Murray Porous Rock Groundwater source that includes the Lower Renmark Aquifer. The Water Sharing Plan establishes a long-term average annual extraction limit that can be accessed in accordance with a licence issued under the *Water Management Act 2000*.

Registered groundwater bores

A search of the NSW Natural Resources Atlas groundwater database revealed sparse groundwater usage around the project site. One groundwater bore is located within the mine site, with four bores located to the north, two to the east and one to the south. Most of the bores were drilled in the 1950s and 1960s. All bores with only one exception were drilled for stock and domestic purposes or had no usage details. One of the bores located to the north of the site was listed as an irrigation bore.

The bore located within the proposed mine site footprint intersected groundwater at 30.5 metres. The bore located approximately six kilometres to the east of the site is recorded as intersecting saline groundwater at a low yield of 0.1 L/s at 77.4 to 79.8 metres depth with a standing water level of 74.7 metres.

Yields in all bores in the vicinity of the proposed mine site were very low, with values ranging from 0.02 – 0.51 L/s. Groundwater in two bores was reported as been saline, one as stock quality and another was labelled as brackish. These reports are consistent with the high salinity levels recorded in the literature for the area.

Groundwater salinity

At the mine site and in its immediate vicinity, the fractured rock aquifer is mapped showing high salinities in the range of 7,000 – 14,000 mg/L TDS (Brodie 1994), while Geosciences Australia (2008) recorded an average of 6,000 – 7,000 mg/L TDS.

In the vicinity of the bore field there is a more variable groundwater salinity range. To the south of the borefield site, salinity is between 14,000 – 35,000 mg/L TDS with some areas east of Lake Coombah (approximately 75 km to the south of the mine site) recording salinity levels of 35,000 – 100,000 mg/L TDS. Further east of the proposed bore field, the

salinity ranges from 3,000 – 4,000 mg/L TDS with salinity decreasing to around 1,000 – 3,000 mg/L TDS in the area immediately surrounding and to the south of Menindee Lakes.

HIO commissioned the drilling of two groundwater monitoring bores in 2014 by Watson Drilling in the south eastern end of the Core anomaly pit. Monitoring included water depth and water quality analysis. In 2017, six vertical bores were drilled and converted to enable groundwater monitoring, and six existing inclined exploration holes were cased with PVC to below the water table to enable groundwater monitoring. The results showed a water table depth between 82 m and 84 m with a TDS between 8,510 and 23,800 mg/L (GEO-ENG, 2018).

Groundwater intersections during exploration drilling

Exploration drilling bore logs undertaken to define a JORC compliant inferred and indicated reserve were reviewed by GHD to assess any comments relating to groundwater intersections.

Of the inclined bores, 75 were drilled using methods that allowed data on groundwater conditions to be noted. Comments relating to groundwater were made for 54 bores and the remaining 21 bores were assumed to be dry. The majority of the bores with comments on groundwater noted that some samples were damp, moist and/or wet; however, no information on groundwater inflows rates were recorded. The drilled depth of these groundwater intersections typically ranged from 80 to 150 metres and is consistent with the deep water table mapped by Brodie (1994). Eleven bores recorded deeper intersections of greater than 200 metres (drilled, not vertical, depth). The typical description of some samples as moist or damp is consistent with the low yields assigned to this fractured rock aquifer.

Eleven holes noted excess groundwater in relation to drilling activities and these holes are assumed to intersect fractured rock aquifer zones which produced some inflows; however, aquifer yields are unknown. The depths of these higher flow groundwater intersections ranged from between 100 to 234 metres (drilled, not vertical, depth). True depths of the intersections would be dependent on the angle at which the hole was drilled. No groundwater quality information was collected during the exploration drilling.

9.1.2 Key potential risks

The project would require a process water supply of about 40 GL/year for use in the processing plant. Geo-Eng (2011, 2016 and 2021) developed a preliminary groundwater model based on pump tests to assess potential bore pumping scenarios that involve obtaining groundwater from a borefield in the Lower Renmark Aquifer in the vicinity of Coombah which is approximately 90 km south of the mine site. This aquifer contains groundwater that has an average salinity level of 13,800 mg/L TDS.

Saline groundwater would be pumped from the bore field to an earthen storage dam located at the mine site. The raw water would then be distributed either directly to the processing plant, or to a water treatment system; likely a reverse osmosis desalination plant. The treated water would then be used for final product washing, slurry transport, and potable water demands.

There is the potential for groundwater impacts at the mine site due to excavation of a pit to depths of up to 400 metres below surface level.

Key hydrogeological risks therefore include:

– Availability of groundwater supply and associated licencing arrangements
– Impacts associated with drawdown of aquifers in the vicinity of the mine site and the borefield
– Impacts on groundwater dependent ecosystems.

9.1.3 Proposed assessment approach

Extensive consultation with (then) DPI has been undertaken, with continued consultation with DPI&E - Water and the Murray Darling Basin Authority (MDBA) would be undertaken during evaluation of water supply options in the BFS and throughout preparation of the EIS. This would involve consideration of the regulatory framework, including the *Water*

Management Act 2000 and associated Water Sharing Plans, *Water Act 1916*, and the Aquifer Interference Policy (2012).

Hydrogeological models for the proposed borefield and mine site would be developed and used as a basis for numerical modelling to assess the potential impact of the project on existing groundwater systems, surface water – groundwater interactions, groundwater dependant ecosystems and registered groundwater users. GEO-ENG commenced the hydrogeological assessment for the project based on the DGRs and the historical SEARs and this included:

- Identification of potential groundwater volume, level, and the direction of flow and quality through the proposed mine life and for the affected aquifers
- Analysis of the impacts of the extent and magnitude of drawdown
- Analysis of the likely quality of extracted groundwater
- Discussion of issues associated with obtaining a licence for the groundwater extraction
- An outline of the proposed program to monitor groundwater extraction
- Assessment of potential impacts on surrounding water users and groundwater dependent ecosystems.

The draft assessment concluded that a suitable groundwater supply could be obtained from proposed bore field in the saline Lower Renmark Aquifer. The water quality of the aquifer is poor, and there is limited demand for their use. Removal of saline water from this aquifer would have a long-term, small, positive impact in reducing saline groundwater seepage to the Murray River. There is not expected to be any significant negative effect on any surface water feature due to groundwater extraction.

9.2 Surface water

9.2.1 Existing environment

The site is located to the south of the Barrier Ranges which is a series of northeast to northwest trending ridges that rise above the surrounding plains. As indicated above, the site is predominantly flat, open shrubland plain with minor rocky rises and outcrops.

Few permanent surface water bodies exist in the region due to low rainfall and high evaporation rates. Most surface water features within the region are ephemeral and only flow during short periods of intense rainfall (Geosciences Australia, 2008). The Menindee Lakes are located approximately 60 kilometres east of the mine site and consist of nine shallow lakes adjacent to the lower Darling River. This lake system comprises both perennial and ephemeral lakes with a combined surface area of about 463 km2. Most of the lakes were isolated from each other in their natural state but are now connected via a series of channels and weirs as part of the Menindee storage scheme. The scheme aimed to secure a water supply for Broken Hill and foster economic development in far-western NSW through irrigated agriculture (Geosciences Australia 2008). The Menindee Lakes have also been used to contribute regulated water supply to parts of Victoria and South Australia under the Murray Darling Basin Agreement.

There are several ephemeral streams within the mine site. The main waterway is Harry Harry Creek which drains in a south-easterly direction to Ryans Lake (Brodie 1994). The infrastructure corridors would cross a number of ephemeral water features.

HIO commenced a surface water monitoring program in 2012 to collect water quality data as input into the EIS surface water assessment. Due to the ephemeral nature of watercourses at the mine site, samples have been collected opportunistically. A total of 15 surface water samples and five rising stage samples have been collected and analysed to date. The samples had high levels of turbidity which is consistent with results that would be expected from an ephemeral waterway in an arid environment.

9.2.2 Key potential risks

Earthworks associated with the project would alter the site topography and impact on surface water flows. Controls would be installed on-site to manage surface water flows.

There is also the potential for water quality to be impacted if runoff from site is turbid, saline or contaminated. This may adversely impact on downstream riparian flora and fauna. There is also the potential for sedimentation and erosion to affect downstream water quality.

The project involves constructing linear infrastructure such as pipelines, access roads and transmission lines that would cross water features. There is the potential for construction and operation of this infrastructure to impact on surface water quality and hydrology.

9.2.3 Proposed assessment approach

The EIS would assess potential impacts on surface water. This would include modelling the hydrological characteristics of surface water flows within the mine site to allow impacts on the hydrological values of Harry Harry Creek to be assessed.

The assessment would be prepared in consultation with NRAR and NSW Water and would likely include:

- A site water balance to define site water demands and the expected volume of discharges. This would identify water supply, storage and management infrastructure
- A description of potable and wastewater management systems
- Assessment of potential impacts on the quality and quantity of surface water discharged from the site, in particular Harry Harry Creek
- Assessment of the potential impacts on the geomorphology of receiving waterways
- Assessment of impacts on riparian corridors
- Determining whether specific measures would be required to manage issues associated with occasional flooding along Harry Harry Creek.

9.3 Ecology

9.3.1 Existing environment

Overview

A preliminary ecological assessment of the project area has been undertaken that included a desktop information review and targeted seasonal surveys. The surveys were conducted in November 2010, December 2012, December 2013, March 2014, May 2014, June 2014, October 2017, September 2018 and November 2021. The surveys covered the:

- Mine site, including the footprints for the pit, waste material dump, mine infrastructure and processing plant and tailings storage facility
- Alignment of the access road that would extend from the site to the Silver City Highway
- Alignment of the electricity transmission line that would extend from the mine site to the existing transmission line near the Silver City Highway
- The borefield and alignment of the raw water supply pipeline
- The slurry pipeline route and rail siding site.

The mine site is dominated by native vegetation in relatively good condition. The most extensive vegetation types at the mine site are chenopod shrublands that have been grazed for over a century. Small areas of Prickly Acacia shrubland, and a stand of River Red Gum Woodland along Harry Harry Creek also occurs in the west of the mine site. The River Red Gum Woodland present along Harry Harry Creek is scarce at the local and regional scale and provides habitat for the Spotted Harrier and other native biota. It is also likely to comprise a regionally significant fauna movement corridor. The current site layout indicates that the project would not directly disturb any areas of River Red Gum Woodland.

A threatened flora species, Purple-wood Wattle (*Acacia carneorum*) was identified in a localised area of the mine site but this is outside the area likely to be affected by the project. The site surveys revealed a moderate diversity of native plants and a high diversity of native fauna, including four species of fauna that are listed as vulnerable under the NSW BC Act,

being the: Western Blue-tongue Lizard, Stripe-faced Dunnart, Rufous Fieldwren and Spotted Harrier.

Relative to the mine site, the southern section of the proposed water supply pipeline corridor and borefield contains a higher diversity of vegetation communities, including threatened communities. A flora survey undertaken along the majority of the borefield and water supply pipeline corridor in May and June 2014 identified 17 broad vegetation classes. A stratified approach was adopted for the fauna survey undertaken in March 2014, ensuring that survey plots were within each vegetation community.

Threatened fauna species recorded in the project area during surveys for the project are listed in Table 5.

Table 5 Threatened fauna species recorded in the project area

Class	Common name	Scientific name	TSC Act	EPBC Act
Birds	Black-breasted Buzzard	*Hamirostra melanosternon*	V	-
	Gilbert's Whistler	*Pachycephala inornata*	V	-
	Hooded Robin	*Melanodryas cucullata cucullata*	V	-
	Little Eagle	*Hieraaetus morphnoides*	V	-
	Pink Cockatoo	*Lophochroa leadbeateri*	V	-
	Malleefowl	*Leipoa ocellata*	E	V
	Pied Honeyeater	*Certhionyx variegatus*	V	-
	Rufous Fieldwren	*Calamanthus campestris*	V	-
	Southern Scrub-robin*	*Drymodes brunneopygia*	V	-
	Spotted Harrier	*Circus assimilis*	V	-
	Striated Grasswren	*Amytornis striatus*	V	-
Mammals	Bolam's Mouse	*Pseudomys bolami*	E	-
	Southern Ningaui	*Ningaui yvonneae*	V	-
	Stripe-faced Dunnart	*Sminthopsis macroura*	V	-
Reptiles	Jewelled Gecko	*Strophurus elderi*	V	-
	Western Blue-tongued Lizard	*Tiliqua occipitalis*	V	-
	Yellow-tailed Plain Slider	*Lerista xanthura*	V	-
Frogs	Painted Burrowing Frog	*Neobatrachus pictus*	E	-

Key: E – endangered, V - vulnerable

* Possible record (two individuals that were probably this species were briefly seen but not heard calling. They moved away before a positive identification could be made).

Based on the results of these surveys reference above, the project area provides habitat for native biota, including threatened species. However, there remain large amounts of alternative habitat in equivalent vegetation types outside the current project infrastructure footprints. Mine infrastructure will be further refined during the BFS and EIS and where practicable infrastructure will be moved to reduce impacts. Field surveys confirmed the presence of 21 NSW Plant Community Types (PCT) within the project area. One PCT is commensurate with an endangered ecological community (*Acacia loderi* shrublands) listed under the *Threatened Species Conservation Act 1995* (TSC Act) and BC Act (refer to Table 7). As indicated in Section 7.3, the area of vegetation to be removed for the project would be quantified during the EIS. The EIS would include a strategy to offset impacts on biodiversity.

9.3.2 Key potential risks

The project would impact on native vegetation and habitat for threatened biota. Direct impacts associated with clearing vegetation and habitat would result in the temporary and permanent loss and/or modification of habitats. This has the potential to cause mortalities and alter the local distribution of species and populations.

Indirect impacts on flora, fauna and fauna habitat would potentially be related to issues such as lighting and noise, and dust impacts.

9.3.3 Proposed assessment approach

An assessment of ecological impacts would be conducted in accordance with relevant guidelines during preparation of the EIS that would address both State and Commonwealth requirements where needed.

This would include:

- A targeted survey of project disturbance footprints that would fill remaining gaps from the investigations undertaken in the past, including:
    - Targeted searches for threatened flora and fauna. These surveys would be limited to species credit that have not been subject to targeted survey during the season required under the Biodiversity Assessment Methodology (BAM)
    - Additional vegetation plots to enable data to be obtained to enter into the BAM calculator
- Preparation of an ecological impact assessment including:
    - Description of the existing environment of the project area
    - Impact assessment, including calculation of the areas of native vegetation types and amounts of habitat resources to be removed or modified
    - Preparation of a Biodiversity Offsets Strategy for the project.

Relevant government agencies such as the Commonwealth Department of Agriculture, Water and the Environment and NSW DPI&E – Biodiversity Conservation Division, have, and would continue to be consulted throughout this assessment to ensure that ecological matters are adequately assessed.

9.4 Aboriginal heritage

9.4.1 Existing environment

Preliminary searches of the Aboriginal Heritage Information Management System (AHIMS) were undertaken for the project. The searches encompassed over 7,400 square kilometres in the vicinity of the area covered by the project footprint.

AHIMS listed 68 previously recorded sites located within or within one kilometre of the proposed disturbance footprints

for the project. These sites comprised:

- Five stone quarries
- One stone arrangement
- One Aboriginal Place
- 61 stone artefact occurrences.

Of those 68 sites, only ten are within the project footprint. Eight of these previous recordings are in and around the location of the previous transport rail siding option that was proposed in 2014 and adjoining section of proposed slurry pipeline, and includes seven artefact scatters and one Aboriginal Place (The Pinnacles). The ninth site is an artefact scatter to the west of the Silver City Highway, on the southern bank of Pine Creek. The tenth site is an artefact scatter in the dune of the Kopi Plain, where the proposed western feeder pipe from the borefield would be located.

DPE has developed the Aboriginal Site Decision Support Tool (ASDST) to support the assessment of Aboriginal sites in NSW at the landscape-scale. The tool extends the AHIMS by illustrating the potential distribution of site features recorded in the database, taking into account that some parts of the landscape have a greater capacity to contain certain site features or features of different types.

The ASDST provides information regarding the extent of accumulated impacts across NSW, the predicted likelihood for sites or site features to be present across the landscape, the reliability of the predictive mapping and the survey priority requirements across the state. The ASDST was reviewed to assist in identifying areas to be inspected during a field survey that was undertaken by Navin Officer from late June 2014 to late July 2014. This involved inspecting areas within the mine site that would be within the likely disturbance footprint for the mine and associated infrastructure, such as the waste material dump, tailings storage facility and processing plant. The survey also covered the proposed alignment of the:

- Access road between the site and the Silver City Highway
- Electricity transmission line between the processing plant and the existing transmission line
- Section of the raw water supply pipeline that is within the property boundary of Wonga Station.

The survey identified a range of Aboriginal site types, including artefacts, artefacts and hearths, artefact scatters / quarries, knapping floors, quarries, and stone arrangements within the project area. Natural landscape features were identified and mapped as having the potential for archaeological deposits to be present. The impact of the project on Aboriginal heritage would be assessed as part of the EIS and this would involve determining the significance of the impact and identifying mitigation measures that would be implemented to minimise impacts. Representatives of the Aboriginal community would be consulted as part of the process to assess the significance of impacts and identify mitigation measures.

9.4.2 Consultation with the Aboriginal community

Consultation with the Aboriginal community has commenced in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010a). Stage 1 of this process involves notification of project proposal and registration of interest and this was undertaken between 22 December 2018 and 2 February 2019. Letters were sent to stakeholders requesting the names of Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects or places for the project area, and a notification was placed in the Barrier Daily Truth and Sunraysia Daily newspapers on 10 January 2018 advertising for expressions of interest to the project.

Registered Aboriginal Parties were provided with information on the project and the proposed assessment methodology and cultural heritage assessment report process. A meeting was then held with the Registered Aboriginal Parties on 10 April 2018 to discuss the project. The Registered Aboriginal Parties have been provided with updates on the status of the project following this meeting.

9.4.3 Key potential risks

The project would disturb the land surface and there is the potential for items of significance to the Aboriginal community to be impacted.

9.4.4 Proposed assessment approach

Investigations would be undertaken to assess potential impacts on Aboriginal heritage. This would involve consideration of potential impacts at the mine site and infrastructure corridors. The Aboriginal cultural heritage assessment would be undertaken in accordance with the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b). This would include:

- Reviewing the AHIMS database and any relevant past studies
- Consulting with Aboriginal stakeholders in accordance with Aboriginal Cultural Heritage Consultation requirements for proponents 2010 (DECCW 2010a)
- Undertaking a field survey of representative areas of the disturbance footprint to identify places or items of Aboriginal cultural heritage significance
- Assessing the significance of Aboriginal cultural heritage items or places
- Developing measures to avoid, reduce and mitigate potential impacts.

9.5 Historic heritage

9.5.1 Existing environment

The following statutory and non-statutory heritage listings were searched:

- Statutory Listings:
    - Atlas of Aboriginal Places
    - World Heritage List
    - The National Heritage List (Australian Heritage Council)
    - The Commonwealth Heritage List (Australian Heritage Council)
    - The State Heritage Register
- Non-Statutory Listings:
    - The State Heritage Inventory
    - The Register of the National Estate (Australian Heritage Council); and
    - Register of the National Trust of Australia (NSW)

The results of those searches indicate that there are no previously listed historic heritage items within the project area.

9.5.2 Key potential risks

The project would disturb the land surface at the mine site and along the ancillary infrastructure corridors.

9.5.3 Proposed assessment approach

Investigations to be undertaken to assess potential impacts on historic heritage would include:

- Consultation with the Heritage NSW as necessary
- A review of heritage listings
- Historical heritage literature review including a review of heritage reports and associated documents relevant to the project area
- Field inspection as required.

A Statement of Heritage Impact would be prepared to determine if the project would impact on historic heritage items.

9.6 Land and agricultural capability

9.6.1 Existing environment

Land use

Land use throughout the region is predominantly agricultural and is dominated by sheep grazing. The mine site incorporates the Burta and Wonga pastoral stations. An application for a mining lease over the mine footprint has been made.

The next closest homestead to the mine site after Burta and Wonga is Oakdale which is located about eight kilometres to the north.

Ancillary infrastructure would primarily be located on land that is subject to Western Land Leases and used for pastoral purposes. In some locations, the ancillary infrastructure may be within road and rail reserves, or on Crown or freehold land.

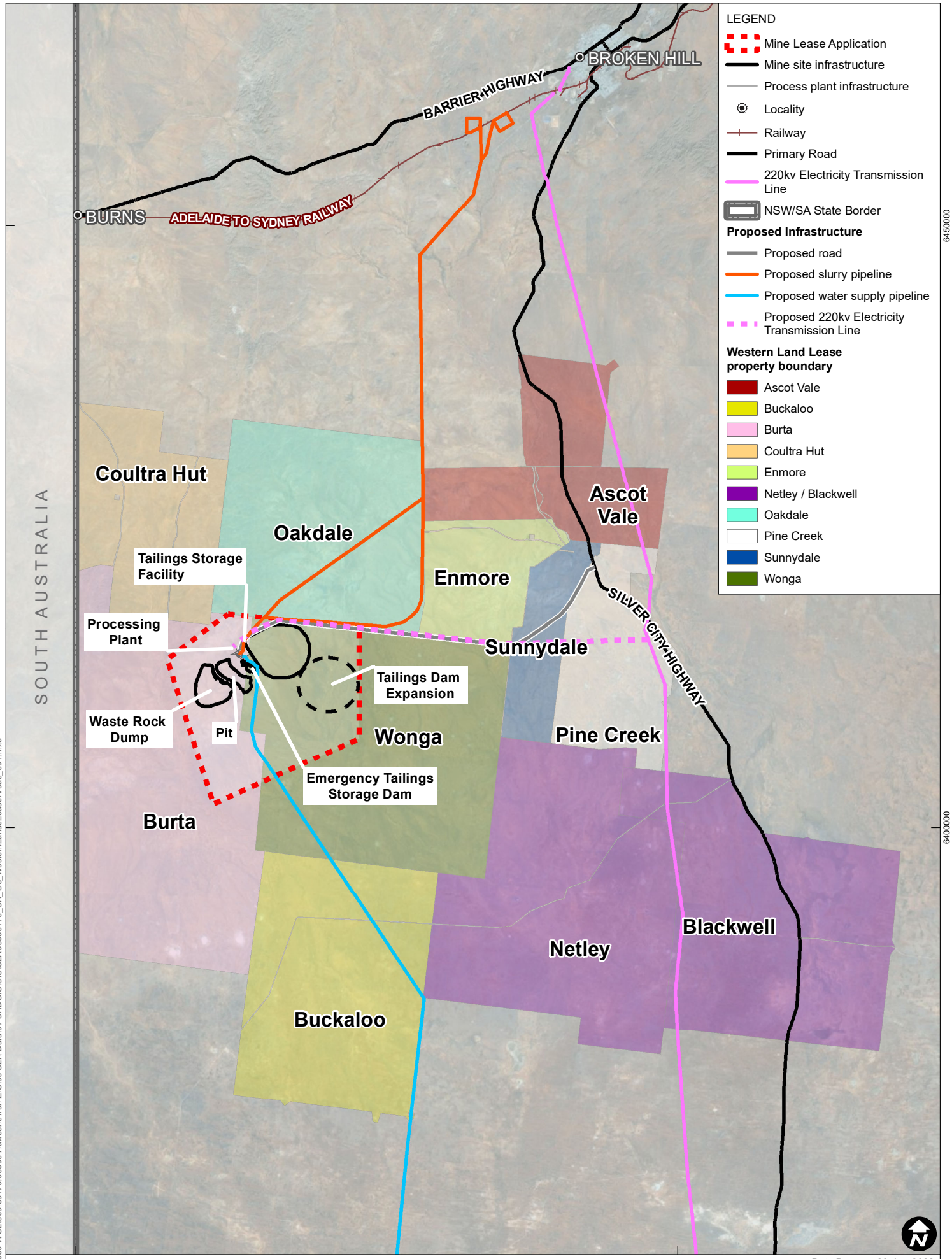
Land capability

NSW Land and Soil Capability (LSC) mapping identifies land in the region to be nutrient limited, and therefore, classifies the land as 'low intensity grazing' (LSC Class 6). Class 6 land has very severe limitations; it is incapable of sustaining many land use practices including cultivation, moderate to high intensity grazing and horticulture. Highly specialised practices can overcome some limitations for some high value products.

9.6.2 Key potential risks

The project would change land use at the proposed mine site and result in land that is currently used for pastoral purposes no longer being available for agricultural production. Installation of ancillary infrastructure would also result in localised changes to land use during construction and operation.

The project also has the potential to indirectly alter land and livestock management, such as access to livestock drinking water, physical access for managing or moving stock related to pasture requirements, and/or if fencing requires re-configuration to ensure efficient operations for example.



Scale: 1:400,000 at A4
Coordinate System: GDA 1994 MGA Zone 54

Date Drawn: 28-Jan-2022
Project Number: 660.30170

Data Source: Basedata, NSW SS, 2022
Aerial Imagery © Department of Customer Service 2020
Proposed Infrastructure digitised from Hawsons Iron Project (GHD, August 2019).
Proposed Infrastructure accuracy limitation - data not appropriate for large scale maps (<1:50,000)

SLR

WESTERN LANDS LEASE PROPERTIES SURROUNDING MINE SITE

FIGURE 9

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9.6.3 Proposed assessment approach

A soil survey and agricultural assessment would be completed in accordance with the Strategic Regional Land Use Policy Guideline for Agricultural Impact Statements guidelines (DP&I 2012). A desktop review would be undertaken to identify the preferred approach to the field soil sampling strategy.

The assessment would consider whether the project would reduce the available land area below a critical level required to ensure the viability of farming enterprises. This would require a financial analysis of current farming enterprises and an assessment of viability under the proposed land use changes.

The soil survey would also provide information that would be used to develop the conceptual Rehabilitation Plan.

9.7 Socio-economic impacts

9.7.1 Existing environment

The City of Broken Hill is the largest regional centre in far western NSW. It is located about 40 kilometres east of the South Australian border. The nearest large population centre is Mildura, located approximately 300 kilometres to the south of Broken Hill in Victoria.

The nearest capital city is Adelaide, approximately 500 kilometres to the southwest of Broken Hill. Due to its location, Broken Hill has strong cultural and historical connections with South Australia.

The population of Broken Hill at the 2016 Census was 17,814 which represents a 45% decline since 1971. This is largely due to the downturn in the local mining industry. In December 2016, the unemployment rate was 7.9%, which was higher than the State average of 5.1%.

Broken Hill has a long history as a mining centre and still has active silver, lead and zinc mines that have been worked for over a century; albeit with significantly reduced output today relative to the past. In recent years the region has been subject to investment associated with development of wind and solar farms. A pipeline has also been constructed by WaterNSW to enable water to be pumped from the Murray River at Wentworth to Broken Hill. This will improve the security and reliability of Broken Hill's water supply.

Broken Hill currently has a range of locally based retail and service industries. These include medical, health, educational, welfare and shopping facilities. Tourism is also an important industry and Broken Hill's proximity to a range of National Parks and attractions such as the Living Desert Sanctuary and Regional Art Gallery bring visitors that contribute to the local economy.

9.7.2 Key potential risks

The project would likely have significant positive social and economic benefits for Broken Hill by creating local employment opportunities. The project is likely to directly employ 500 people when operating. In addition, construction of the project would require about 1,200 workers. Where possible, personnel would be drawn from the local workforce, however employees from outside the region would also likely be required.

Most of the permanent workforce is likely to be based in Broken Hill and would travel to the site on a daily basis. The increase in population would partially offset the generational decline in population associated with a downturn in the regional mining industry. The project would expand employment opportunities in an industry sector that has a long history in Broken Hill.

Social impacts

Potential social impacts of the project relate primarily to workforce planning, and how that alters demand for housing and accommodation as well as local services and infrastructure. This would consider the potential social impact of a temporary influx of construction workers. Other social impacts may be associated with changes to amenity, either in the

immediate surrounds of the project site, or from associated transport infrastructure.

A key focus of the socio-economic impact assessment would be upon social impact management and the development of mechanisms to capitalise on the opportunities provided by the project to maximise local benefits. The project brings a number of opportunities to Broken Hill.

Workforce availability

The project's demand for skilled labour is unlikely to be met through local supply. As a result, the project would compete for its workforce with a number of other energy and resources sector projects being developed in NSW as well as interstate.

Whilst the mining and construction industries are important sectors of the Broken Hill economy, restructuring in the mining industry has had a significant impact on the population of Broken Hill, leading to substantial declines since a peak in the 1970s. Although still in decline, the rate of population decline has slowed in recent years.

9.7.3 Proposed assessment approach

Potential socio-economic impacts may include changes to access and demand for local services and infrastructure, housing and accommodation, and social impacts associated with changes to amenity (i.e. as a result of potential impacts such as noise or air quality) at surrounding receptors. The EIS will assess potential socio-economic impacts and would include:

- Social issues related to the project that are raised during implementation of the Stakeholder Engagement Strategy
- Analysis of the impact the additional staff attracted to Broken Hill would likely have on access to, and demand for, local social services, housing and infrastructure
- A review of the EIS technical studies for air quality and noise that have the potential to impact on social amenity
- Measures that would be implemented to avoid, reduce and mitigate predicted social impacts
- A benefit‑cost analysis which would be prepared that would identify and quantify the potential economic benefits and costs of the project.

As the project is expected to impact on the broader regional economy, a regional economic impact analysis would also be undertaken. This would analyse impacts on the regional economy during construction, operation, decommissioning and rehabilitation and would consider issues such as labour market impacts due to direct and indirect employment. This would discuss the project's contribution to the regional and NSW economies.

The social impact assessment would comply with the NSW DPI&E's Social Impact Assessment Guideline for State significant mining, petroleum production and extractive industry development (2021). The economic assessment would comply with the NSW DPI&E's Guidelines for the economic assessment of mining and coal seam gas proposals (December 2015).

9.8 Air quality

9.8.1 Existing environment

Baseline air quality monitoring in the form of dust deposition was undertaken at the Wonga homestead from October 2010 to September 2014. The location, installation and operation of the gauges complies with the relevant Australian Standard (AS/NZ3580.10.1 – Methods for sampling and analysis of ambient air – Determination of particulates - Deposited matter – Gravimetric method). The deposited insoluble dust in the gauges was analysed by EML Air Pty Ltd using NATA accredited practices.

A summary of applicable ambient air quality criteria for suspended particulate matter is provided in Table 6 based on the Approved Methods for the Modelling and Assessment of Air Pollutants of in New South Wales (EPA 2016). A maximum

incremental deposited dust value of 2 g/m^2/month (annually averaged) is a key target criterion for this project. Table 7 lists criteria for the maximum permitted increase in deposited dust.

Table 6 Air quality assessment criteri a for particulate matter concentration

Substance	Criteria (µg/m^3)	Averaging period
Total suspended particulate matter (TSP)	90	Annual
Particulate matter <10 µm (PM10)	50	24 hour maximum
	25	Annual
Particulate matter <2.5 µm (PM2.5)	25	24 hour maximum
	8	Annual

Table 7 Criteria for deposited dust

Substance	Averaging period	Maximum Increase in Deposited Dust Level (from baseline)	Maximum Total Deposited Dust Level
Deposited dust	Annual	2 g/m^2/month	4 g/m^2/month

The annualised deposition rate (g/m^2/month) has been measured as part of the baseline monitoring campaign. The background dust levels have generally been measured at around 1.0 g/m^2/month. Therefore, any incremental increase, due to mine operations, of up to 2.0 g/m^2/month would not exceed the 'maximum total deposited dust level' allowed for in the Approved Methods (EPA 2016).

Some of the monitoring results have exceeded the NSW guideline levels, including a measurement of 4.5 g/m^2/month in December 2011. The highest readings generally occurred during months that had low levels of rainfall or events such as dust storms. Local issues concerning bird interference with the dust deposition gauges contaminated some samples and resulted in elevated results.

9.8.2 Key potential risks

The main potential issue associated with air quality would be dust generation due to activities such as:

- Clearing vegetation
- Earthworks such as excavating soil and overburden, and loading, transporting and placing the material
- Earthworks to construct process and utility infrastructure
- Drilling and blasting
- Crushing ore
- Wind erosion of stockpiles and other disturbed areas
- Vehicle movements on unsealed roads.

9.8.3 Proposed assessment approach

The EIS would include an air quality assessment that would be prepared in consultation with the EPA. The assessment would be in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA 2016) and would:

- Characterise the background air quality, including dust deposition and total suspended particulates. This would be based on data obtained from the monthly sampling program
- Identify the nearest sensitive receptors (expected to be over eight kilometres from the mine)
- Assess potential air quality impacts on the nearest sensitive receptors
- Compare the predicted dust impacts against relevant criteria for total suspended particulates, particulate matter smaller than 10 microns (PM10) and particulate matter smaller than 2.5 microns (PM2.5)
- Develop measures to avoid, reduce and mitigate potential impacts.

9.9 Noise

9.9.1 Existing environment

The mine site is in an isolated location and that has low background noise levels. Surrounding land use is limited to pastoral operations. There are no industries or land uses in the surrounding area that result in substantive noise emissions. The Silver City Highway is the nearest land use beyond the site that generates noise. The infrastructure corridors are similarly located in isolated areas that typically have low background noise levels.

Aside from the dwellings on the two Western Land Lease stations, one of which is presently occupied, the nearest sensitive receiver is Oakdale. Any supporting infrastructure located on rural land to the west of Broken Hill, has low background noise levels also.

9.9.2 Key potential risks

The main noise impacts would be associated with increased noise due to construction and operation of the mine and processing equipment in a rural area. Noise would primarily be generated during, blasting, ore crushing and processing, in addition to ancillary infrastructure such as pump stations and the substation.

The project would also increase road traffic noise due to additional vehicle movements during construction, operation, decommissioning and rehabilitation. Noise would be also generated by pumps that would transport raw water from the borefield to the mine site, and the transport of the final magnetite product.

9.9.3 Proposed assessment approach

The noise assessment would be prepared in consultation with the NSW EPA and would address the requirements of the following guidelines, where required:

- NSW EPA Noise Policy for Industry (EPA, 2017)
- NSW Road Noise Policy (DECCW, 2011)
- NSW Rail Infrastructure Noise Guideline (EPA 2013)
- Interim Construction Noise Guideline (DECC, 2009)
- Australian and New Zealand Environment Council – Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (1990).

9.10 Waste management

9.10.1 Key potential issues

A range of waste types would be generated during the construction, operational, decommissioning and rehabilitation stages of the project. These are expected to include:

- Construction waste
    - Vegetation from site clearing, landscaping and ongoing maintenance
    - Excess soil from cut activities (this would be stockpiled for reuse during rehabilitation works)
    - Packaging, surplus construction materials such as timber, concrete, gravel, metals and plastics
    - Electrical and telecommunications cabling off-cuts, packaging and cable reels
    - Contaminated material, if any is encountered
- Staff generated wastes
    - Food and drink packaging (paper, cardboard, liquid paperboard, plastics, ferrous and non-ferrous metals, glass)
    - Office and administration waste
    - Sewage
- Operational waste
    - Waste oils, oily rags, solvents, lubricants and fuel waste
    - Tyres
    - Equipment waste
    - Saline brine from water treatment plant, which involves desalination of groundwater
    - Chemicals and chemical containers
- Mineral waste
    - Overburden
    - Waste rock
    - Tailings.
- Decommissioning and rehabilitation
    - Plant and equipment
    - Building waste
    - Crushed concrete and steel reinforcement
    - Mining equipment
    - Contaminated material, if any is present.

All suitable soil, overburden, and small volumes of vegetation for landscaping and rehabilitation works, while recyclables (metals, cardboard, paper, glass etc.) may be salvaged and reused or sold to the appropriate industries. It is assumed that plant and equipment would be on-sold or scrapped during decommissioning and rehabilitation.

9.10.2 Proposed assessment approach

The EIS would characterise the likely waste types and quantities to be generated by the project. This will outline the proposed storage, treatment, handling and final disposal options available. An assessment will be carried out to check that adequate waste management services and facilities are available at a regional level for the types and quantities of waste expected to be generated.

The waste management options and opportunities for each of the wastes identified will be assessed for impacts on the environment through generation, storage, transport, handling and disposal. Where possible, disposal locations would be identified for wastes. Indicative reuse opportunities during the construction and operational stages of the project would also be identified.

A mine waste and tailings geochemical assessment would be undertaken to determine the risk of acid, neutral and / or saline drainage from the mined material. This would also inform the conceptual closure plan for site rehabilitation.

9.11 Traffic and transport

9.11.1 Existing environment

The mine site is located approximately 30 kilometres west of the Silver City Highway and is currently accessed via an unsealed private road that was formed to enable access to Wonga Station. The Silver City Highway links Broken Hill in the north to Wentworth in the south and is a two lane sealed road. At its closest point, the mine site is approximately 35 kilometres south of the Adelaide – Sydney railway line.

9.11.2 Key potential risks

Potential traffic and transport impacts would be associated with an increase in the number of vehicles that would travel along the Silver City Highway, principally between the site access point and Broken Hill. The project would also involve construction of a road to link the mine site to the highway and this would entail a new intersection that would be constructed to TfNSW's standards. Further route options analysis would be undertaken for the location of any new roads and the connection points to the existing road network.

An internal road network would be constructed to accommodate staff and operational vehicle parking, loading and circulation requirements.

The project may also involve construction of infrastructure such as pipelines within road reserves which may potentially impact on the roads. This would be considered further during the BFS and EIS.

9.11.3 Proposed assessment approach

The location of the ancillary infrastructure corridors would be confirmed as part of the BFS and EIS. The outcome of engineering and BFS investigations would determine the location of any supporting infrastructure.

The EIS would assess potential impacts on current transport networks and this would inform any additional transport infrastructure requirements. The assessments would be undertaken in accordance with relevant guidelines, including TfNSW, Broken Hill City Council, and ARTC.

9.12 Hazards and risks

9.12.1 Proposed assessment approach

The project would transport, use or store a number of dangerous goods during the construction and operational stages, including, but not limited to, explosives (used during blasting), diesel and other hydrocarbons. A preliminary hazard analysis (PHA) would be undertaken in accordance with the requirements of SEPP33. The main objective of the PHA would be to show that the residual risk levels are acceptable in relation to the surrounding land use, and that any risk would be appropriately managed. This would be done by systematically:

- Identifying hazards and abnormal operating conditions that could give rise to hazards
- Analysing all hazards in terms of their consequence (effects) to people, the surrounding land uses and environment and their probability (likelihood) of occurrence
- Quantifying the analysis and estimating the resultant risks to surrounding land uses and the environment

– Assessing the risks in terms of the location, land use planning implications and existing criteria and ensure that the proposed safeguards are adequate.

The PHA would be undertaken in accordance with Hazardous Industry Planning Advisory Paper No. 6 (HIPAP 6) and other related HIPAP documents, such as HIPAP 4 or HIPAP 12 (Department of Planning, 2011).

9.13 Greenhouse gas

9.13.1 Proposed assessment approach

The EIS would describe and assess greenhouse gas (GHG) emissions likely to be generated by the project. This would include GHG embodied in materials or otherwise caused to be generated through vegetation clearing by the construction and operation of the project. The assessment would include:

– A GHG inventory of projected annual emissions for each relevant GHG with total emissions expressed in 'CO2 equivalent' terms for the following categories:
    - Scope 1 – emissions which are direct emissions of GHG from sources within the boundary of the facility and as a result of the facility's activities
    - Scope 2 – emissions of GHG from the production of electricity that the project would consume, but that are physically produced by another facility
    - Scope 3 – emissions that are generated in the wider economy as a consequence of a person or business's activities. These are indirect emissions as they arise from sources that are not owned or controlled by that person or business but they exclude Scope 2
– An outline of the data collection and calculation procedures used to create the GHG emissions inventory
– A brief description of the method(s) by which estimates were made
– A description of proposed actions and measures for GHG abatement.

The GHG assessment would be prepared in accordance with the general principles of the following reference materials, as they represent current industry practice in Australian greenhouse gas accounting:

– The Greenhouse Gas Protocol (World Business Council for Sustainable Development, 2004). This is a globally recognised corporate accounting and reporting standard
– National Greenhouse Accounts Factors (Australian Government Department of Environment)
– Technical Guidelines for the Estimation of Greenhouse Gas Emissions by Facilities in Australia Australian Government Department of Environment)
– Life Cycle Assessment principles (ISO 14040 series).

9.14 Bushfire

9.14.1 Existing environment

The mine site is located within an area dominated by low lying vegetation comprising chenopod shrublands that have been grazed for over a century. There are also small areas of Prickly Acacia shrubland, and a stand of River Red Gum Woodland along Harry Harry Creek to the west of the mine.

9.14.2 Key potential risks

The area is mapped as bushfire hazard Vegetation Category 3. There is the potential for bushfire to impact the mine site due to the hot dry conditions that predominate. Given the isolated nature of the site there is a high likelihood that bushfires will need to be managed on site, with a limited ability to evacuate.

9.14.3 Proposed assessment approach

A bushfire hazard analysis will be undertaken to inform the EIS and project design. The findings of the bushfire hazard analysis will then be implemented via a bushfire management plan.

10 Conclusion

HIO proposes to develop an open cut magnetite mine in far central-western NSW which is located approximately 60 kilometres south-west of Broken Hill, in close proximity to the South Australia border. The project is expected to have an annual production target of up to 20 Mtpa of magnetite concentrate from approximately 160 million tonnes per annum run-of-mine ore with initial project sizing based on time to first product and existing infrastructure capacity. Further engineering studies would be undertaken as part of the BFS and this will take place in parallel with the EIS. The engineering studies will involve conducting route options analysis for ancillary infrastructure corridors and determination of final mine layout in consideration of onsite constraints.

HIO will submit an EIS to the NSW Department of Planning and Environment that would assess potential impacts associated with the project. Potential areas of environmental risk may include hydrogeology, ecology, and Aboriginal cultural heritage. The project also has the potential to increase demands on social services in the region. These key environmental aspects would be thoroughly assessed as part of a wider suite of studies to inform the project.

Stakeholders including government agencies, representatives of the Aboriginal community, landholders and the broader community would be consulted during preparation of the EIS. This would provide opportunities for ongoing iterative feedback during the approvals process.

The project has the potential to generate substantial positive impacts by creating direct and indirect employment in the Broken Hill region and contributing royalties to the NSW economy.

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Appendix A - Scoping Summary Table

Environmental Impact Statement (EIS) scoping worksheet for:			*Hawsons Iron Project* hh								Date:	Jan-22	
What matters might be impacted?			**What activities might cause an impact?**	**What are the characteristics of the impact?**						**How will the impact be managed?**	**What are the community and other stakeholder views?**	**What level of assessment and engagement is required in the EIS preparation phase?**	
Social and environmental matters **I.e. natural or human assets or values aggregated at the level most appropriate for informing management and assessment requirements** ***Click on the matter for a description, or the link above for full glossary***			**Without any mitigation, is the proposal likely to impact on the matter?** ***(Select from list)***	**If there is a 'likely' impact:** **1. list the activities expected to cause the impact; and** **2. if applicable, list the receptor being impacted and its status.** *E.g. construction noise will be heard at nearby school* **If 'unlikely', briefly explain why. Has the impact been actively avoided through project design or site location?** ***(Manual entry)***	**Is the impact, without mitigation, expected to cause a material effect with regard to its...** ***(Answer 'Y', 'N' or '?')*** ***Click on characteristic for description, or the link above for further detail***				**Does the impact need assessment in the EIS?** ***(Auto fills)***	**Is the impact, without mitigation, expected to have a material cumulative effect with other impacts (including from other projects)?** ***(Select from list)***	**What safeguards and management measures are expected to be required to address the impact?** ***(Select from list)***	**Are there community or other stakeholder concerns regarding the impact or activity?** ***(Based on engagement with community and other stakeholders)*** ***(Select from list)***	**Expected level of assessment and/or engagement required** ***(Auto fills)***	**Relevant section in Scoping Report** ***(Manual entry)***
					extent?	**duration?**	**severity?**	**sensitivity?**						
What does the proposal mean for people?	AMENITY	acoustic	Likely	Construction and operational activities have the potential to generate noise. Limited blasting at surface, ore crushing and processing.	Y	Y	Y	N	Yes	Yes	Standard	Yes	Other Issue + CIA + Focussed Engagement	Section 9.9
		visual	Unlikely	The site is remotely located with no direct visual impact anticipated.								No	Scoping Report	Section 3
		odour	n/a											
		microclimate	n/a										No assessment necessary - Worksheet only	
		other - please specify	n/a										No assessment necessary - Worksheet only	
	ACCESS	access to property	Unlikely	The Project will not alter access to properties. Access agreements will be entered into with the leaseholders on whose land Project activities will occur.								No	Scoping Report	Section 3 and 6
		utilities	Unlikely	The Project is unlikely to impact on access to public utilities, with only electricity potentially sourced from the grid.								Yes	Scoping Report + Explain avoidance	Section 6.6
		road and rail network	Unlikely	The Project is unlikely to impact on access to public roads and rail. Road access via the Silver City Highway will be requred, however, given the low existing vehicle volumes impacts are not anticipated. Rail is currently being considered to transport material to Port.								No	Scoping Report	Section 6.6
		offsite parking	n/a											
		other - please specify	n/a										No assessment necessary - Worksheet only	
	BUILT ENVIRONMENT	public domain	Unlikely	The closest public domain area is located within the township of Broken Hill. Impacts unlikely.								No	Scoping Report	Section 9.7
		public infrastructure	Unlikely	The site will be accessed via the Silver City Highway. However, given the low volumes of existing traffic there is not anticipated to be an impact from workers accessing the site from Broken Hill.									Scoping Report	Section 9.7
		other built assets	n/a										No assessment necessary - Worksheet only	
		other - please specify	n/a										No assessment necessary - Worksheet only	
	HERITAGE	natural	Unlikely	No items of natural heritage have been identified in proximity to the site.								No	Scoping Report	Section 9.5
		cultural	Unlikely	No items of non-indigenous cultural heritage are known in proximity to the site								No	Scoping Report	Section 9.5
		Aboriginal cultural	Likely	The project would disturb the land surface and there is the potential for items of significance to the Aboriginal community to be impacted.	Y	Y	Y	Y	Yes	Yes	Project Specific	Yes	Key Issue + CIA + Focussed Engagement	Section 9.4
		built	Unlikely	No items of built heritage in proximity to Project activities.								No	Scoping Report	Section 9.5
		other - please specify	n/a										No assessment necessary - Worksheet only	
	COMMUNITY	health	Unlikely	Potential impacts to health are unlikely given the remote location of the Project. Potential impacts from emissions to air will be assessed as part of air quality impact assessment.								Yes	Scoping Report + Explain avoidance	Section 9.7 (socie-economic), Section 9.8 (Air quality)
		safety	Likely	Increase of trucks and light vehicles on the local road network has the potential to impact on the safety of road users.	N	Y	N	Y	Yes	No	Standard	Yes	Other Issue + Focussed Engagement	Section 9.7
		services and facilities	Likely	The closest town of Broken Hill is unlikely to have capacity to service workforce needs particularly during the construction phase. Potential impacts on services and facilities in Broken Hill will be assessed as a result of an influx of workers.	Y	Y	N	Y	Yes	Yes	Project Specific	Yes	Key Issue + CIA + Focussed Engagement	Section 9.7
		cohesion, capital and resilience	Likely	The community of Broken Hill has a strong connection to the mining industry, both through historical and current operations. The continuation of mining through the Project has the potential to have an impact, both negative and positive, on community cohesion and resilience	Y	Y	N	Y	Yes	Yes	Project Specific	Yes	Key Issue + CIA + Focussed Engagement	Section 9.7
		housing	Likely	The closest town of Broken Hill does not have capacity to service workforce needs particularly during construction. Workers will be accommodated in Broken Hill with the potential to suppliment this within the mine camp. Potential changes in workforce demographics will be assessed.	Y	Y	N	N	Yes	Yes	Project Specific	Yes	Key Issue + CIA + Focussed Engagement	Section 9.7
		other - please specify	n/a										No assessment necessary - Worksheet only	
	ECONOMIC	natural resource use	Unlikely	Ore which will be extracted for the Project will be processed to produce magnetite concentrate, however it is unlikely to have an impact on economic uses of other natural resources.									Scoping Report	Section 5
		livelihood	Unlikely	The Project will help to improve the local economy, which currently has a higher level of unemployement than the State average. The Project would employee 1,200 people during construction and 500 during operations providing important positive benefits to livelihoods,									Scoping Report	Section 4

Environmental Impact Statement (EIS) scoping worksheet for:	*Hawsons Iron Project* hh									Date:	Jan-22	
What matters might be impacted?			**What activities might cause an impact?**	**What are the characteristics of the impact?**						**How will the impact be managed?**	**What are the community and other stakeholder views?**	**What level of assessment and engagement is required in the EIS preparation phase?**	
Social and environmental matters **I.e. natural or human assets or values aggregated at the level most appropriate for informing management and assessment requirements** ***Click on the matter for a description, or the link above for full glossary***			**Without any mitigation, is the proposal likely to impact on the matter?** ***(Select from list)***	**If there is a 'likely' impact:** **1. list the activities expected to cause the impact; and** **2. if applicable, list the receptor being impacted and its status.** *E.g. construction noise will be heard at nearby school* **If 'unlikely', briefly explain why. Has the impact been actively avoided through project design or site location?** ***(Manual entry)***	**Is the impact, without mitigation, expected to cause a material effect with regard to its...** ***(Answer 'Y', 'N' or '?')*** ***Click on characteristic for description, or the link above for further detail***				**Does the impact need assessment in the EIS?** ***(Auto fills)***	**Is the impact, without mitigation, expected to have a material cumulative effect with other impacts (including from other projects)?** ***(Select from list)***	**What safeguards and management measures are expected to be required to address the impact?** ***(Select from list)***	**Are there community or other stakeholder concerns regarding the impact or activity?** ***(Based on engagement with community and other stakeholders)*** ***(Select from list)***	**Expected level of assessment and/or engagement required** ***(Auto fills)***	**Relevant section in Scoping Report** ***(Manual entry)***
					extent?	**duration?**	**severity?**	**sensitivity?**						
		opportunity cost	Unlikely	The land and low intensity grazing on which Project activities will occur has very low value.									Scoping Report	Section 9.6
		other - please specify	n/a										No assessment necessary - Worksheet only	
What does the proposal mean for the natural environment?	AIR	particulate matter	Likely	The Project will result in dust and particulate matter being generated during construction and during operations.	Y	Y	N	N	Yes	Yes	Project Specific	Yes	Key Issue + CIA + Focussed Engagement	Section 9.8
		gases	Likely	Operation of machinery and plant will generate gaseous emissions. However, these will be localised.	N	Y	N	N	No			No	Scoping Report	Section 9.13
		atmospheric emissions	Likely	Operation of machinery and plant, including onsite power generation (gas powered generators), will generate atmospheric emissions.	N	Y	N	N	No	Yes	Standard	No	Other Issue + CIA	Section 9.13
		other - please specify	n/a										No assessment necessary - Worksheet only	
	BIODIVERSITY	native vegetation	Likely	Native vegetation will be cleared for Project infrastructure. Residual impacts will require biodiversity offsets. Post mining rehabilitation will aim to restore land to a condition similar to its pre-mining land use where possible with infrastructure corridors removed. However, the pit void will remain.	Y	Y	N	y	Yes	Yes	Project Specific	Yes	Key Issue + CIA + Focussed Engagement	Section 9.3 (Ecology) Section 6.7 Rehabilitation)
		native fauna	Likely	Removal of native vegetation has the potential to have a negative impact on native fauna. Post mining rehabilitation will aim to restore land to a condition similar to its pre-mining land use, where possible where possible with infrastructure corridors removed. However, the pit void will remain.	y	Y	N	Y	Yes	Yes	Project Specific	Yes	Key Issue + CIA + Focussed Engagement	Section 9.3 (Ecology) Section 6.7 Rehabilitation)
		other - please specify	n/a										No assessment necessary - Worksheet only	
	LAND	stability and/or structure	Likely	The onsite infrastructure will impact the agricultural use during operations and on completion of mining.	Y	Y	Y	N	Yes	No	Project Specific	No	Key Issue	Section 9.6
		soil chemistry	Likely	Soils will be removed in the area of the mine infrastructure.	Y	Y	Y	N	Yes	No	Project Specific	No	Key Issue	Section 9.6
		capability	Likely	Rehabilitation will aim to return the land traversed by infrastructure corridors to a similar capability as existed pre-mining. However, the mine site will be subject to long term land capability changes.	Y	Y	Y	N	Yes	No	Project Specific	No	Key Issue	Section 9.6
		topography	Likely	Significant changes to topography will occur within the mine site with the pit remaining as a void and waste rock stockpiles remaining on site.	Y	Y	Y	N	Yes	No	Project Specific		Key Issue	Section 9.2
		other - please specify	n/a										No assessment necessary - Worksheet only	
	WATER	water quality	Likely	Impacts to surface and groundwater may potentially occur. Controls will be implemented to prevent release of contaminated water to surface waters. Groundwater is highly saline and will be used for mine demands (primarily in the process plant).	y	y	Y	Y	Yes	No	Project Specific	Yes	Key Issue + Focussed Engagement	Section 9.1 and 9.2
		water availability	Likely	Insufficient surface and groundwater is available in the local area with saline groundwater pumped from approximately 90km to the south just west of Coombah. There is the potential for drawdown due to inflows into the pit and as a result of groundwater removal from deep acquifers.	y	y	N	N	Yes	No	Project Specific	Yes	Key Issue + Focussed Engagement	Section 9.1 and 9.2
		hydrological flows	Unlikely	Harry Harry Creek an emphemeral watercourse traverses the western site boundary. However, other than crossings of drainage channels for linear infrastructure, creeks or watercourses will not be impacted. Impacts on hydrological flows will occur during the course of project earthworks and material storage during the course of major rainfall events.	Y	Y	N	N	No	Yes	Project Specific	No	Key Issue + CIA	Section 9.1
		other - please specify	n/a										No assessment necessary - Worksheet only	
What risks does the proposal face?	RISKS	coastal hazards	Unlikely	The Project is not near coastal lands								No	Scoping Report	N/A
		flood waters	Unlikely	The Project is not located near flood prone land								No	Scoping Report	Section 9.2
		bushfire	Likely	The Project is not located on land identified as vegetation category 3. A bushfire management plan will be prepared to inform construction and operations.	Y	Y	N	N	Yes	No	Project Specific	No	Key Issue	Section 9.14
		undermining	Unlikely	Underground mining not proposed	N	N	N	N	No	No		No	Scoping Report	N/A
		steep slopes	Unlikely	Site is generally flat with low grades	N	N	N	N	No	No		No	Scoping Report	N/A
		other - please specify	n/a										No assessment necessary - Worksheet only	