



**STATE
PLANNING
COMMISSION**

GUIDELINES

For the preparation of an

ENVIRONMENTAL IMPACT STATEMENT

BHP Olympic Dam Resource Development Strategy

Proposal by BHP Billiton Olympic Dam Corporation Pty Ltd

Minister for Energy and Mining
Department for Energy and Mining

State Planning Commission
Department of Planning, Transport and Infrastructure

May 2020



**Government
of South Australia**

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GLOSSARY

AHD	Australian Height Datum
BAU	Business as Usual — includes operations, facilities, services, infrastructure, works, repairs, maintenance, new projects and studies to support production of up to approximately 200,000 tonnes per annum of copper and associated products
CAF	cement aggregate fill
CEMP	Construction Environmental Management Plan
Clause 28 land	The land identified in clause 28 (1) of the Olympic Dam and Stuart Shelf Indenture; this includes the Special Mining Lease and land required for the transport, supply and provision of petroleum, electricity or water.
CHMP	Cultural Heritage Management Plan
Development Act	South Australian <i>Development Act 1993</i>
DIDO	Drive-in, drive-out
EIS	Environmental Impact Statement
EP	Evaporation ponds
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FIFO	Fly-in, fly-out
GAB	Great Artesian Basin
GDE	Groundwater dependant ecosystems
Indenture	The Olympic Dam and Stuart Shelf Indenture, a Schedule to the <i>Roxby Downs (Indenture Ratification) Act 1982</i>
Indenture Minister	Minister for Energy and Mining
mbgl	metres below ground level
MNES	Matters of National Environmental Significance
non-Clause 28 land	Other land not specified under Clause 28 of the Indenture (see definition of Clause 28 land)
ODC	BHP Billiton Olympic Dam Corporation Pty Ltd
OD-RDS	Olympic Dam Resource Development Strategy
ODV	Olympic Dam Village
OEMP	Operational Environmental Management Plan
the Proposal	The proposal is referred to as 'OD-RDS and continuing BAU'. Any activities and works considered BAU that remain un-commenced on the date of the decision will form part of the assessment and decision.
RCP	Representative Concentration Pathway
SA	South Australia
SML	Special Mining Lease
SPC	State Planning Commission
tpa Cu	tonnes per annum of copper
TSF	Tailings storage facility
UOC	Uranium oxide concentrate
WHS	Work Health and Safety

INTRODUCTION

The Olympic Dam mine, located approximately 560 kilometres (km) north west of Adelaide in South Australia, commenced operations in 1988 after approval of an Environmental Impact Statement (EIS) completed in 1982 for mining and production of up to 150,000 tonnes per annum of copper (tpa Cu) and associated products (uranium oxide, gold and silver). In 1995, an Environment Review process dealt with several variations to the original 1982 approvals.

In 1997, an additional EIS was completed for a phased expansion of the underground mining and surface processing facilities for mining and production of up to 350,000 tpa Cu and associated products. This expansion was proposed to be completed in two phases, a first phase increasing mining and production up to approximately 200,000 tpa Cu and associated products, and a second phase increasing mining and production up to approximately 350,000 tpa Cu and associated products.

The first phase considered in the 1997 EIS (operations up to approximately 200,000 tpa Cu and associated products) has been substantially implemented and is referred to as Business as Usual (BAU). The second phase considered in the 1997 EIS, production of up to 350,000 tpa Cu and associated products, was subject to potential additional assessment requirements, and has not commenced.

The current operation consists of an underground mine, milling, mineral processing plant, copper smelter and refinery, and associated infrastructure producing final copper, uranium oxide, gold and silver products. The nearby township of Roxby Downs, the Olympic Dam Village (ODV) and the Olympic Dam airport service the current operation.

BHP Billiton Olympic Dam Corporation Pty Ltd (ODC) is proposing to implement the Olympic Dam Resource Development Strategy (OD-RDS), which seeks to increase production at the Olympic Dam mine and mineral processing facility from BAU operations to up to 350,000 tpa Cu and associated products (by way of staged production increases). In addition ODC is proposing to seek approval for all new development that it will undertake as part of its BAU operations after the date of decision.

The OD-RDS component is primarily a brownfields proposal to expand the existing use of the existing site. If approved, BAU facilities and activities will be utilised, upgraded, replaced and expanded as needed to enable OD-RDS. OD-RDS is a 25-year staged proposal.

Consistent with separate undertakings provided by the Minister for Energy and Mining and the Minister for Planning, all development associated with ongoing operations can continue. A range of forecast new activities and works to facilitate production up to 200,000 tpa Cu and associated products can commence while the assessment process is underway and in advance of any decision on OD-RDS. Any activities and works that the proponent has not commenced on the date of the decision will form part of the decision. The proposal in entirety is referred to as 'OD-RDS and continuing BAU'.

The capital expenditure for the development is likely to be in the order of A\$3.17 billion and has the potential to generate 1800 construction jobs and up to 600 additional operational roles. Operations at Olympic Dam would extend for the current projected life of the mine, which is estimated at more than 60 years.

The OD-RDS and continuing BAU proposal falls within two jurisdictional areas:

1. Land identified by clause 28(1) the Olympic Dam and Stuart Shelf Indenture (the Indenture) (known as Clause 28 Land) being:
 - the Special Mining Lease (SML) area, and
 - 'infrastructure corridor' areas required for the transport, supply or provision of petroleum, electricity or water to support the proposal.
2. Land within the Municipal Council of Roxby Downs area (known as non-Clause 28 land) (refer to figures 1-1, 1-2 and 1-3).

The Minister for Energy and Mining (the Indenture Minister) and the Minister for Planning (the Planning Minister) on 14 February 2019, and by variation on 19 September 2019, declared by notice appearing in the *South Australian*

Government Gazette, the assessment as a major development of the expansion, including the ability to utilise, upgrade, amend or expand existing facilities, services, infrastructure and operations of the Olympic Dam mine to support the production of up to 350,000 tpa Cu and associated products pursuant to section 46 of the *Development Act 1993* (SA) (the Development Act).

All development covered by the two Olympic Dam Major Development Declarations are components of a single proposal for the ongoing operation and expansion of the Olympic Dam mine and mineral processing operations. Although the interaction between the Indenture and the Development Act requires that two sets of Guidelines will apply to the proposal, this document sets out a single set of combined guidelines. A single EIS will address the requirements of both sets of guidelines, for assessment and decision by the South Australian and Australian Government.

Assessment

Section 46 of the Development Act ensures a full examination of matters affecting the environment, the community or the economy to a significant extent, in the assessment of this proposal.

The Minister for Energy and Mining, as the Minister responsible for the *Roxby Downs (Indenture Ratification) Act 1982*, and the State Planning Commission (SPC) are responsible for setting the level of assessment required (Environmental Impact Statement, Public Environmental Report or Development Report) and to provide Guidelines for the preparation of the assessment document by ODC.

On consideration of the potential implications of the proposal, the Indenture Minister and the SPC have determined the proposal will be subject to an **Environmental Impact Statement** (EIS), as set out in section 46B of the Development Act. The Minister and SPC considered an EIS as appropriate due to the number and scale of issues to be investigated.

The Indenture Minister and the SPC have now prepared these Guidelines for the staged and integrated development of the Olympic Dam operation to support staged increases in production up to 350,000 tpa of Cu and associated products based upon the significant issues relating to the proposal.

In setting these Guidelines, the Indenture Minister and the SPC determined a need for a broader assessment and investigation of the following:

- Extraction of additional eight (8) megalitres of water from the Great Artesian Basin.
- Impact of increase in mining and mineral processing on air quality, radiation, water quality (ground and surface waters) and waste management, including tailings storage facilities.
- Wider economic and social impacts of a large expansion of mining and associated activities, including sustainability and climate change matters.
- The impact on Aboriginal and non-Aboriginal heritage and flora and fauna in the far north region.

The EIS should be prepared in accordance with these Guidelines and should describe what ODC wants to do, what the environmental, economic and social effects will be and how ODC intends to manage the operations to minimise any potential adverse short- and long-term environmental impacts.

The Minister and the SPC developed the guidelines to assist in defining the expected impacts (extent, nature and significance) associated with the proposal. The use of these guidelines will fully inform the assessment process and allow determination whether, on balance, the proposed mitigation strategies result in impacts that are as low as reasonably practical.

In accordance with the Guidelines the EIS should cover the construction, ongoing operation and closure/rehabilitation phases of the proposal and, where possible, should outline opportunities to incorporate best practice design and management.

For the purposes of environmental impact assessment under the Development Act, the meaning of ‘environment’ is taken to include an assessment of environmental (biological and physical), social and economic effects associated with the proposal, and the means by which those effects can be managed.

On satisfactory preparation of the EIS in accordance with the Guidelines, the Development Act requires a public exhibition of the document for at least 30 business days and the holding of a public meeting during this period.

The SPC’s role in the assessment process is now complete. From this point, the Indenture Minister and the Planning Minister will continue with the assessment under section 46 of the Development Act.

The documentation, submissions during the consultation process and the proponent’s response to issues raised as well as an analysis of these documents will then be used by the Indenture Minister in the decision-making process, pursuant to section 48 of the Development Act, to determine whether the development can be approved, and if so the conditions that would apply.

ODC has submitted a Referral for the proposal to the Australian Government Department of Agriculture, Water and the Environment, in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

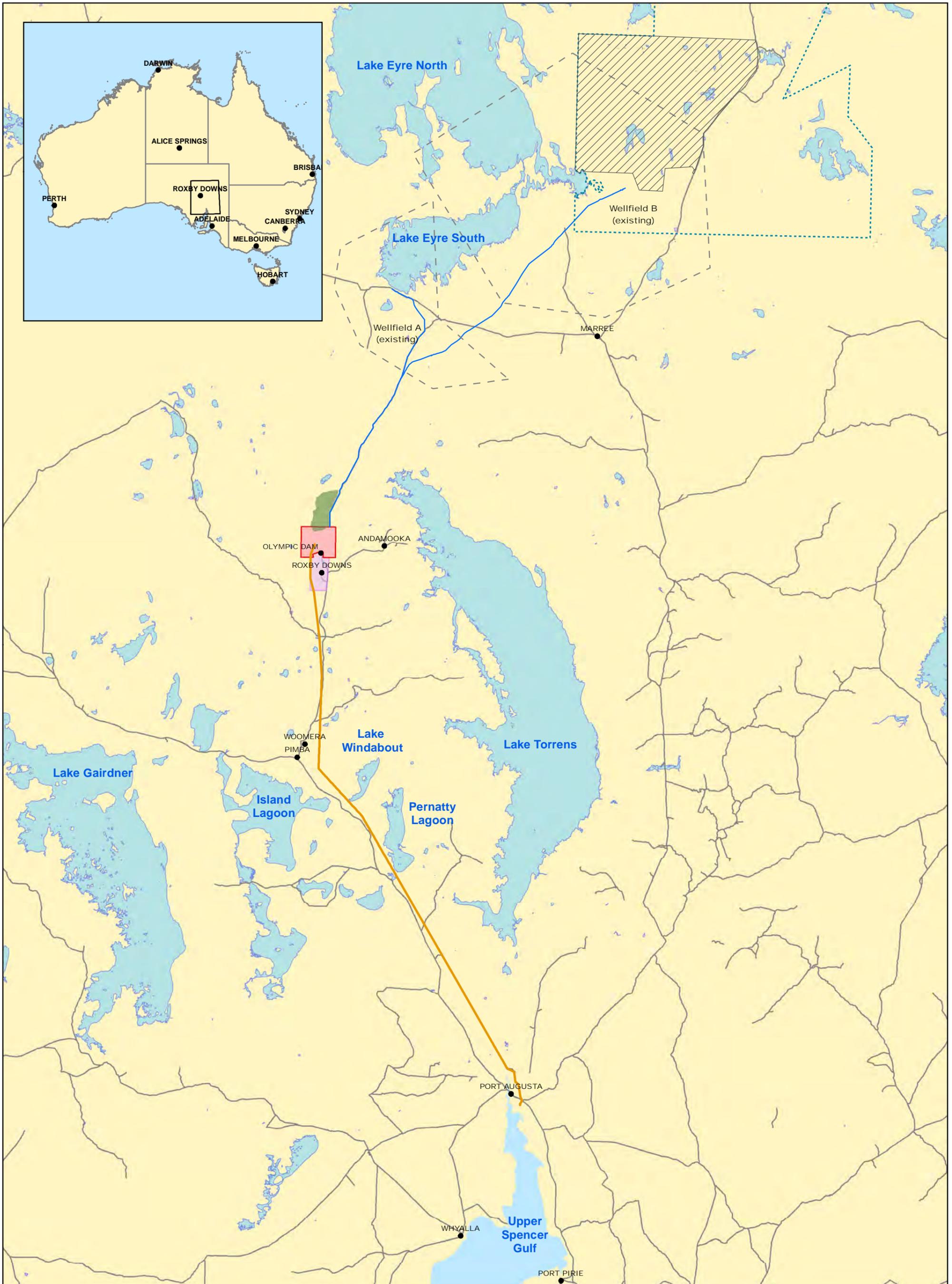
A delegate of the Australian Minister for the Environment has determined that the proposed action is a controlled action that requires an assessment and then an approval under Part 9 of the EPBC Act before it can proceed. The delegate determined that the proposed action needs an assessment because it is likely to have, or may have, a significant impact on protected matters of national environmental significance including:

- Listed threatened species and communities (section 18 & section 18A);
- Listed migratory species (section 20 & section 20A); and
- The environment because the proposal is a nuclear action (section 21 & section 22A).

The Australian Minister for the Environment has advised the Government of South Australia the Commonwealth will assess the proposal through an Accredited Assessment Process pursuant to section 87(1) of the EPBC Act. This process will accredit the South Australia Major Development assessment process for the purposes of assessing this proposal. To ensure this document satisfies the accreditation requirements, these Guidelines have been prepared with input from the Commonwealth. The Commonwealth Government will also intimately partner the State throughout the assessment process.

The Assessment Report published after South Australia’s assessment of the proposal under section 46 of the Development Act will provide the Australian Minister for the Environment, or their delegate, with sufficient information to make an informed decision whether or not to approve the proposed action under Part 9 of the EPBC Act. The report as published becomes one input to a process at the Commonwealth level, set out in Part 9 of the EPBC Act, by which the Minister or a delegate determines whether to approve the proposed action, and if so, under what conditions.

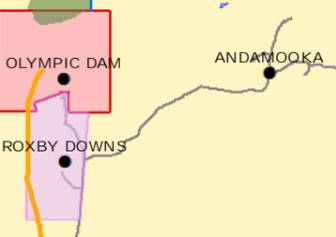
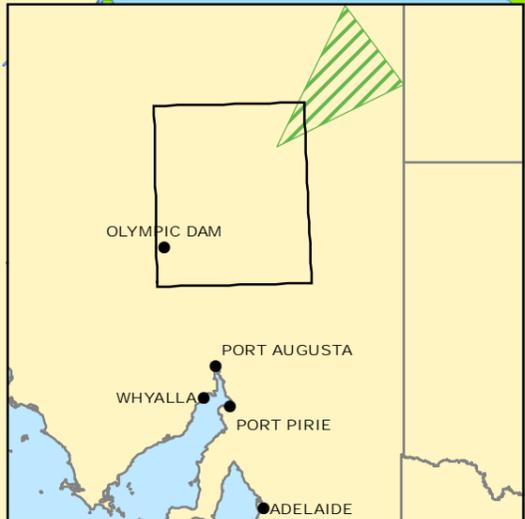
The Commonwealth approval process under Part 9 of the EPBC Act is separate and additional to the approval process led by the South Australian government under the Development Act.



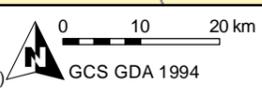
Legend	<ul style="list-style-type: none"> Special Mining Lease Roxby Downs Municipality Arid Recovery Primary Focus Area for Water Investigations (proposed) Indicative Water Investigation Area (proposed) 	<ul style="list-style-type: none"> Wellfields Area (existing) Transmission Line (existing) Water Pipeline (existing) Road (existing) 	  GCS GDA 1994
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**OVERVIEW OF OD-RDS
AND CONTINUING BAU LOCATION**

Drawn: A. Villa	Date: 17/09/2019	Revision: 0
Checked: N. Patten	Filename: F2.1_Location Map.mxd	FIGURE 1-1



Legend	
Special Mining Lease	Primary Focus Area for Water Investigations (proposed)
Roxby Downs Municipality	Indicative Water Investigation Area (proposed)
Arid Recovery	Wellfield Area (existing)
Conservation Reserve	Transmission Line (existing)
Coongie Lakes Ramsar Area	Water Pipeline (existing)
Road (existing)	Pump Station (existing)
Production Bore (existing)	



WATER SUPPLY INFRASTRUCTURE

Drawn: A. Smith	Date: 1/03/2019	Revision: 0
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- Legend**
- Special Mining Lease
 - Roxby Downs Municipality
 - Arid Recovery
 - Transmission Line (existing)
 - Water Pipeline (existing)
 - Road (existing)
 - Excavation Location (proposed)



0 10 20 km
GCS GDA 1994

TRANSMISSION LINE

Drawn: A. Smith	Date: 22/03/2019	Revision: 0
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DESCRIPTION OF THE EXISTING ACTIVITY

The Olympic Dam operation is located approximately 560 km north-west of Adelaide in Far North South Australia. The Olympic Dam Village (ODV) located 6 km south of the mine and the township of Roxby Downs, located approximately 16 km to the south of Olympic Dam support the mining operation.

The existing operations at Olympic Dam comprise an underground mine, mineral processing plant and associated infrastructure located within the Olympic Dam Special Mining Lease (SML).

Two wellfields, that provide water to the operation and township through several water pipelines, are located 120 km north (Wellfield A) and 200 km north east of Olympic Dam (Wellfield B).

A 132 kilovolt (kV) power line from Olympic Dam to Pimba and a 275 kV power line that extends to Port Augusta provide power to the township and to the operations.

The current Olympic Dam BAU operation located on the 17,800 hectare (ha) SML consists of an underground mine, milling, mineral processing plant, copper smelter and refinery, and associated infrastructure producing copper, uranium oxide, gold and silver products (refer to figure 1-4).

Between 1997 and 1999, a major expansion of the mine and mineral processing plant increased production from 150,000 tpa Cu to 200,000 tpa Cu and associated products. In recent years, annual copper production has averaged about 180,000 tonnes, along with 4,000 tonnes of uranium oxide, 80,000 ounces (oz) of gold and 800,000 oz of silver. As a result of a planned major smelter maintenance campaign, Olympic Dam production was reduced to 137,000 tonnes of copper in financial year 2018.

The Olympic Dam ore body begins about 300 metres below the surface and continues to a depth of more than 1 kilometre. The existing mining operation employs a sub-level open stope method of underground mining. The underground operation includes crushing stations, vertical ventilation shafts and an automated rail network, used to produce and transport crushed ore to the surface, where conveyors move the ore to the processing plant.

When the ore reaches the processing plant, it is sent to a concentrator, where it is milled, and a slurry formed by adding water is passed through a series of flotation stages to separate the minerals, producing a copper-rich concentrate and uranium-rich tailings.

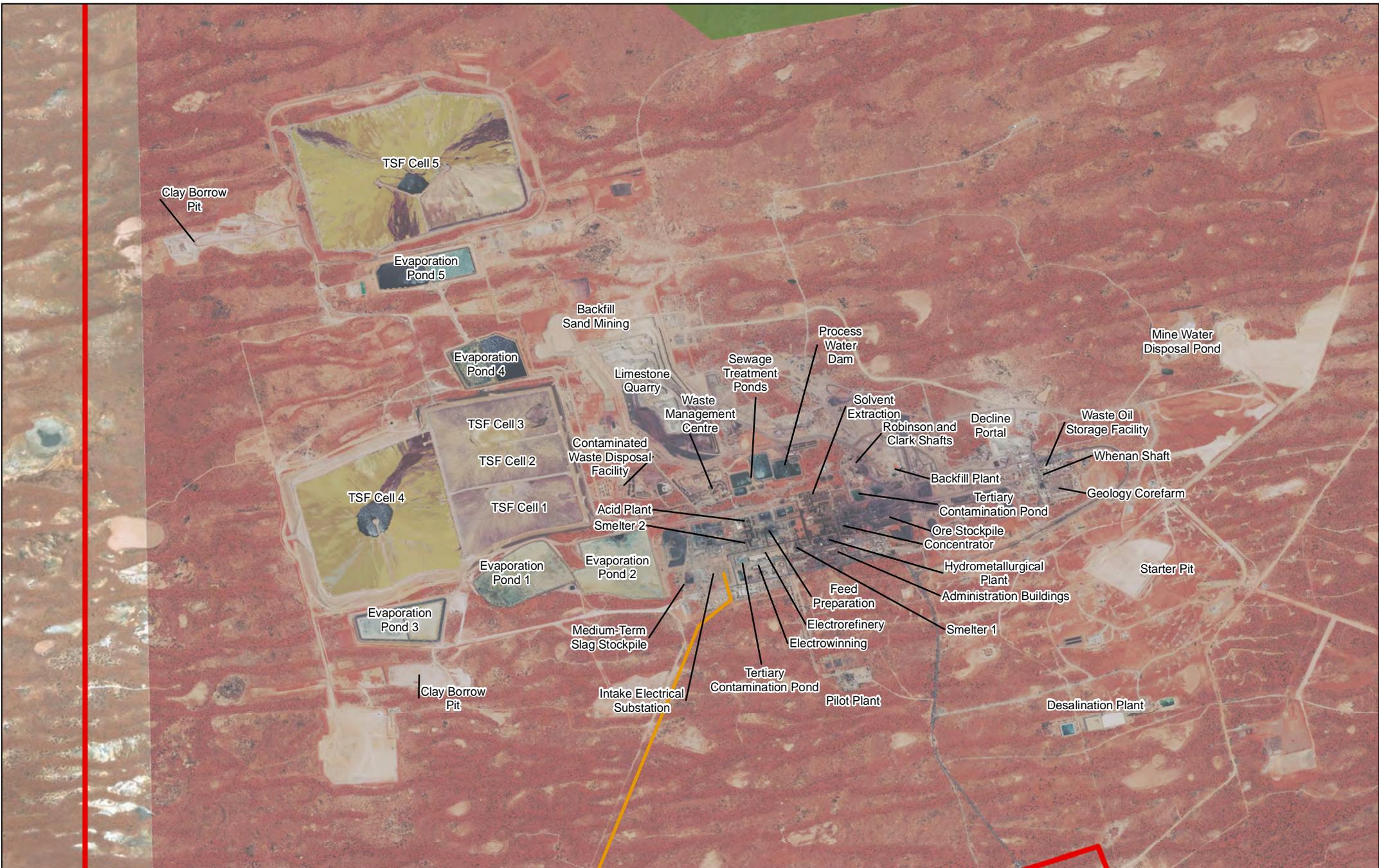
The concentrate is leached in acid to remove residual uranium and to produce a neutral slurry, which is dried before being fed into the smelter to produce copper anodes. The copper anodes are then processed in the refinery to produce high-purity copper cathodes. The residue from the refining process is treated separately to recover gold and silver. As part of operations, concentrate and/or anode copper is intermittently imported from either local or international sources, for processing.

The tailings from the concentrator pass into the hydrometallurgical plant to extract the uranium, which is then precipitated from solution before being heated and dried to produce uranium oxide.

Copper produced at Olympic Dam is sold to markets in Australia and Asia. Olympic Dam sends the uranium oxide to converters overseas for further processing into fuel used in nuclear power reactors in Asia, Europe and North America. ODC sends all gold and silver to The Perth Mint.

Located within the Roxby Downs Council area are services that support the Olympic Dam operation including the Olympic Dam Village, adjacent or south of the Olympic Dam operations located on the SML and the Roxby Downs accommodation village located within the township of Roxby Downs.

Also adjacent the Olympic Dam facility is the Olympic Dam airport and Olympic Dam heavy industrial estate. The Roxby Downs industrial estate is located on north edge of the Roxby Downs, between the mine site and the township, and contains businesses that support and provide maintenance services to Olympic Dam operations.



BHP

Legend

- Transmission Line (existing)
- Special Mining Lease
- Arid Recovery



Projection
GCS GDA 1994

Service Layer Credits:
Source: Esri, DigitalGlobe,
GeoEye, Earthstar
Geographics,
CNES/Airbus DS, USDA,
USGS, AeroGRID, IGN,
and the GIS User

**MAJOR COMPONENTS OF
THE EXISTING OPERATION WITHIN THE SML**

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Figure 1-4

DESCRIPTION OF PROPOSAL

The proponent proposes to expand the existing Olympic Dam copper, uranium, gold and silver mine and processing plant. Associated infrastructure including water pipelines, power lines and general infrastructure will be developed, upgraded or expanded. The proposal is in the scoping phase, with exact development expansion options and timing being investigated, and as a result, OD–RDS and continuing BAU is currently the subject of further detailed feasibility studies.

OD–RDS and continuing BAU will be a staged integrated project undertaken by ODC. Some aspects may quickly become integrated and others may remain unchanged for some time given the existing equipment such as workshops, administration buildings are capable of supporting OD–RDS and continuing BAU without further change.

Overall site operations operate within ‘project’ element footprints for example mine, processing plant, tailings storage facilities etc. The proponent currently reports annually land disturbance within these footprints to the state government. The OD–RDS and continuing BAU proposal will seek to undertake the assessment of land disturbance in a similar way. Therefore, BHP is seeking assessment of specific elements of the OD–RDS and continuing BAU proposal within envelope areas where each proposed element will occur. A cumulative assessment for the entire proposal will also be necessary.

The land disturbance footprint proposed by the application is conceptual at present, so the proponent cannot yet provide specific boundaries, calculations and areas. These proposal envelopes represent the outermost boundary of where the proposal element may occur. The proposal envelope boundaries represent some 1,219,325 hectares (refer to figure 1-6). However, the proponent expects that, once built, the overall land disturbance footprint of operations will be approximately 8350 ha of the SML.

Mining

The primary extraction method is a variant of sub-level (underground) open stoping, in which blocks of mineralised ore are systematically blasted and the ore reserved for crushing below ground. The crushed ore is then hoisted up one of the shafts to the surface stockpile.

The rate of underground mining will increase for the OD–RDS and continuing BAU, however the mining method (sub-level open stope) will remain consistent.

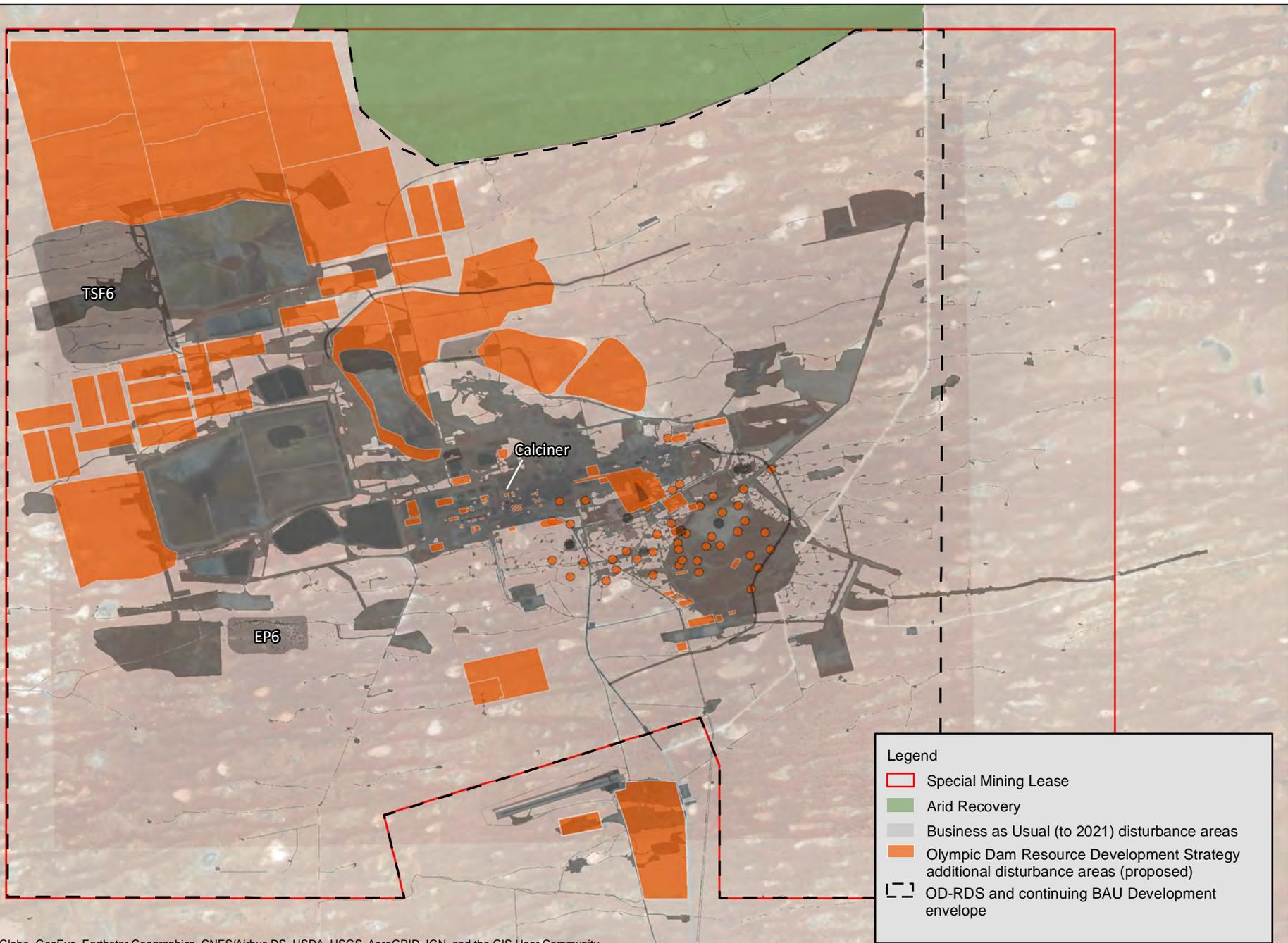
Additional subsurface materials handling infrastructure, such as mechanised hoists and/or additional declines, will be installed to transport mined material to the surface. Other subsurface infrastructure such as the underground rail network will be expanded where required.

The capacity of surface infrastructure will be increased to support increased production from the mine. This could include a number of options including materials handling infrastructure, ventilation infrastructure including shafts, ventilation refrigeration, backfill plant (cement or paste) crushers, quarries, borrow pits, concrete batching plants and stockpiles for run-of-mine ore, low-grade ore and waste rock. Surface materials handling infrastructure such as ore stackers, ore storage, conveyors and truck loading will be expanded as necessary.

Infrastructure servicing the SML such as underground explosives magazines, saline water droppers and surface storage, dewatering pump stations and electricity distribution will be upgraded or expanded where necessary. Maintenance services such as workshops, fuel storage and distribution will be expanded to support the OD–RDS and continuing BAU. Other services such as compressed air, LPG storage, fire and potable water supplies, offices and laundry and ablutions facilities will also be expanded.

Backfilling of the underground voids will continue to be undertaken using cement aggregate fill (CAF) material. However, an alternative paste or flowable backfill method (using tailings-based fill material) is proposed for OD–RDS and continuing BAU, providing the operations with the ability to optimise mining operations and the potential to improve environmental impacts (through the use of tailings material) and reduce operational costs.

Laydown yard(s) may be required to support the above-described activities.



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Note: This figure shows the footprint of business as usual (BAU) activities and proposed OD-RDS activities within and outside the SML. This footprint is Indicative only and the locations, size and layout of activities within the SML are expected to be subject to change as engineering studies and designs progress.



0 1 2 Km

GDA 1994 MGA Zone 53

EXISTING AND CONCEPTUAL PROPOSED DEVELOPMENT

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Date: 9/10/2019

Revision: 2

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Filename: Proposed Development.mxd

Figure 1-6

Other key components of mining for OD–RDS and continuing BAU relate to expanded facilities for long-term stockpiling of low-grade ore and waste rock materials, additional surface crushing facilities and the potential addition of paste backfill to replace some of the CAF, which is used to backfill depleted underground stopes.

Processing

Processing for OD–RDS and continuing BAU will remain largely unchanged, however, the rate of processing will be higher and there will be some notable changes including the addition of a tailings leach bypass and two-stage smelter.

Concentrator and hydromet

The expansion of the concentrator and hydrometallurgical plant for the OD–RDS and continuing BAU proposes a number of options. These include new ball mills, Jameson (flotation) cells, upgraded concentrate thickeners, upgraded reagent storage and delivery systems, upgraded counter current decantation thickeners, additional calciner, upgraded tailings deslime disposals, installation of a tailings leach bypass, upgraded concentrate leach thickeners, construction of new lasta filters used for dewatering, integration of liquor treatment process to support paste backfill and an upgraded site laboratory.

Additional waste storage facilities for the disposal of tailings will be constructed. This will include additional tailings storage facilities (TSFs) and additional evaporation ponds (EPs). As a result of the new TSFs and EPs, new topsoil stockpiles will be required to be established.

Laydown yard(s) will be required to support activities described above.

Smelter

Within the smelter, OD–RDS and continuing BAU proposes to:

- upgrade feed preparation (including new and replacement infrastructure),
- upgrade the flash smelting furnace (including new and replacement infrastructure),
- improve slag handling and electric furnace (including installation of a coke grinding and injection facility), improve gas and dust handling (including new and upgraded equipment),
- build new acid plant(s), anode furnace,
- improve casting wheel (including construction of a new anode furnace and new gas scrubbing system), and
- build new oxygen and nitrogen plant supplies, additional slag dams and slag stockpiles, and flash furnace coolant stream (either slag granulation system or slow cooling in pots).

The direct blister flash smelting furnace may be converted to a two-stage smelter with an additional flash smelter, gas cleaning and acid plants to enable increased production of up to 350,000 tpa Cu and associated products. Excess steam produced by the smelting process may be captured and used to operate a steam turbine to produce electricity in a new cogeneration plant.

Concentrate and/or anode copper will continue to be intermittently imported from either local or international sources in accordance with current practice, for processing as part of operations.

Additional supporting facilities that could be constructed include expanded distribution and delivery systems throughout the smelter and acid plant for caustic soda, coke and flux storage, steam, plant air, demineralised water, potable water, process water, fire water and high voltage power, additional cooling tower cells in the smelter, acid plant and oxygen plant, a new cooling tower in the acid plant and additional LPG storage facilities.

Laydown yard(s) will be required to support activities described above.

Refinery

Within the refinery and gold room, the OD–RDS and continuing BAU proposes an integrated machine bay, expansion of the electrorefinery tankhouse, additional copper refinery cells and sections, cathode storage, installation of an ion exchange plant and automated cranes.

Expansion of the precious metals refinery and slimes treatment area is also proposed and could include the installation of a slimes thickener, autoclave and a tellurium removal circuit. Laydown yard(s) will be required to support activities described above.

Supporting services and infrastructure

Water

Additional water is required to support the OD–RDS. Therefore, the OD–RDS and continuing BAU proposal proposes to install one or more additional production bores in the indicative water investigation area to increase extraction of water sourced from the Great Artesian Basin (GAB) up to a total maximum of 50 megalitres per day (ML/d) annual average. Additional water supply infrastructure (such as headworks and piping) would be required to connect the new well(s) to the existing water supply infrastructure.

OD–RDS and continuing BAU also proposes to upgrade, expand or duplicate existing water supply infrastructure on and off the SML (e.g. pump stations, pipelines), new on site water storages and a new desalination plant, which would replace the one currently in operation on the SML. Brine disposal facilities from the desalination plant may be required, however brine will generally be added into the process water storages.

Laydown yard(s) will be required to support activities described above.

Power

The OD–RDS and continuing BAU will continue to utilise the existing 132 kV and 275 kV transmission lines that service Olympic Dam. Small-scale excavation will be required at three locations beneath the existing 275 kV line from Davenport (near Port Augusta) to Olympic Dam to maintain required mid-span ground clearances under maximum load. However material changes to the line are not envisaged. Power consumption will fit within the engineered capacity of the transmission lines, therefore no duplication of transmission lines is required. Substation upgrades and expansion will be required on the existing transmission lines. Substation upgrades and expansion or new substations will be required within the 132 kV and 11 kV distribution networks at Olympic Dam. Additional generators to supplement the power supply may also be installed on a temporary or permanent basis.

Laydown yard(s) will be required to support activities described above.

General infrastructure

The OD–RDS and continuing BAU proposes an upgrade of:

- workforce accommodation within the vicinity of the ODV as well as, adjacent to Roxby Downs and in the vicinity of the Roxby Downs Village;
- additional industrial allotments within Roxby Downs (refer to figures 1-7 and 1-8);

as well as:

- expansion of airport facilities and parking;
- expansion of infrastructure for supply of potable water;
- expansion or duplication of the SML and ODV sewage treatment plants;
- additional roads, lighting and communication infrastructure;
- expansion of laundry facilities; installation of temporary toilet facilities around site; and
- car parking facilities for construction activities.

Other general infrastructure that could be required includes on site concrete batching and abrasive blasting facilities, additional quarries, additional borrow pits for clay supply and sand supply (for flux and backfill).

Waste treatment, storage and disposal facilities such as general waste landfill, contaminated waste disposal facility and a facility for disposal of structural low-level radioactive waste (e.g. generated by Olympic Dam operations and demolition activities) would be developed, utilised and amended or expanded where required.

Laydown yard(s) will be required to support activities described above.

Transport

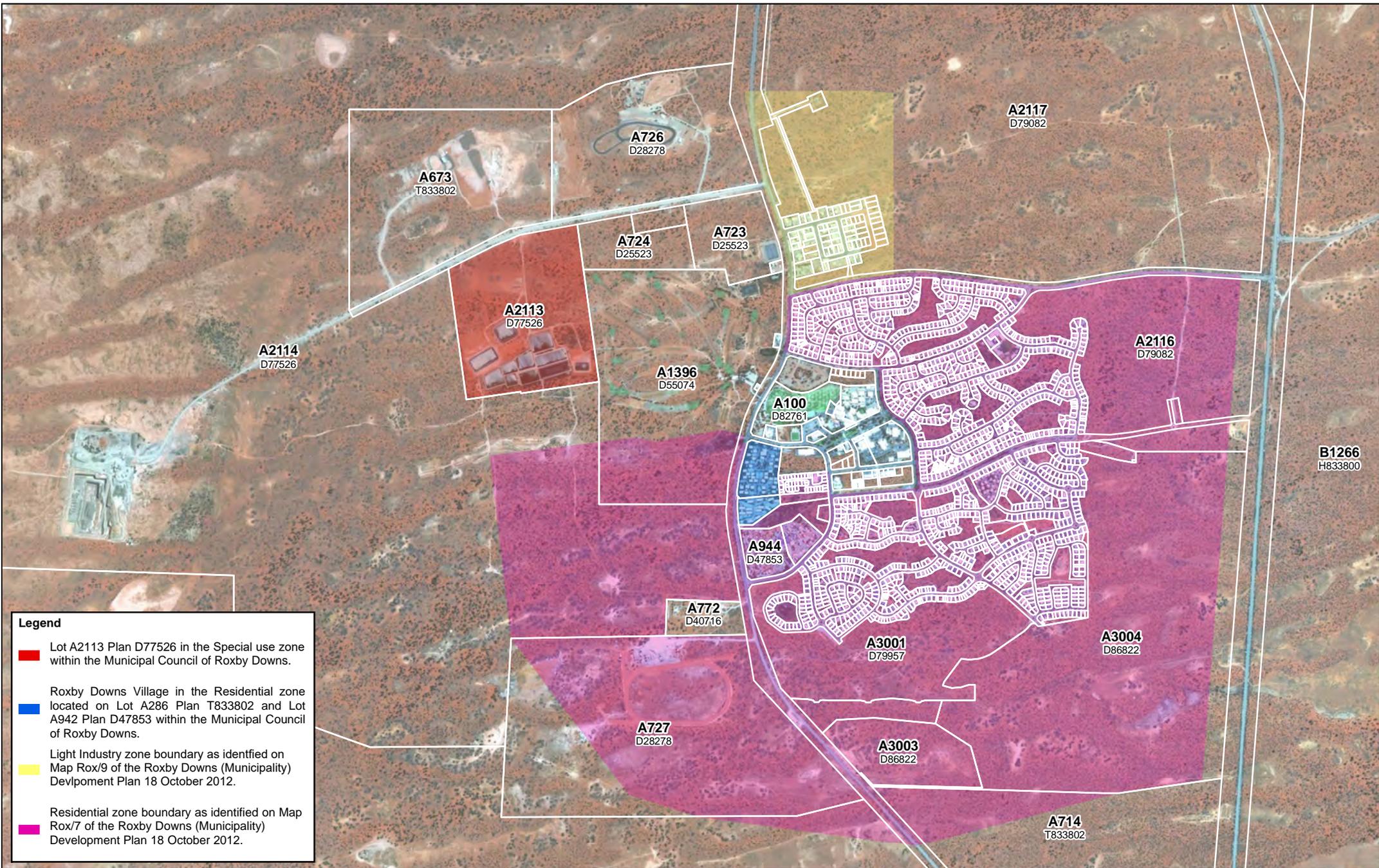
All major consumables and commodities are currently transported by road in and out of Olympic Dam, with the exception of gold, which is transported by air. Materials will continue to be transported to and from the site using existing transport infrastructure as production increases. Export of final products from the site is expected to be consistent with current operations, which export copper cathode, uranium oxide and silver by road. However the number of vehicle movements will increase. Gold will continue to be air freighted directly from Olympic Dam to The Perth Mint. Uranium oxide will continue to be exported from Port Adelaide.

Equipment for upgrade, replacement or expansion projects will be transported to Olympic Dam using existing port and road infrastructure. Depending on the construction methodology deployed, there is potential to establish laydown areas in the Upper Spencer Gulf region, with pre-assembled equipment transported to Olympic Dam as standard or oversize loads. Laydown areas in the Upper Spencer Gulf will be subject to separate third party approvals and are outside the scope of the OD RDS and continuing BAU approval application.

Consumables

Majority of consumables such as reagents, fuel, chemicals, water and energy will increase with the increase in production.

Current power use for Olympic Dam and Roxby Downs is approximately 134 megawatts (MW) which is expected to increase to 250 MW, but as indicated above, utilising existing trunk infrastructure.



Legend

- Lot A2113 Plan D77526 in the Special use zone within the Municipal Council of Roxby Downs.
- Roxby Downs Village in the Residential zone located on Lot A286 Plan T833802 and Lot A942 Plan D47853 within the Municipal Council of Roxby Downs.
- Light Industry zone boundary as identified on Map Rox/9 of the Roxby Downs (Municipality) Development Plan 18 October 2012.
- Residential zone boundary as identified on Map Rox/7 of the Roxby Downs (Municipality) Development Plan 18 October 2012.

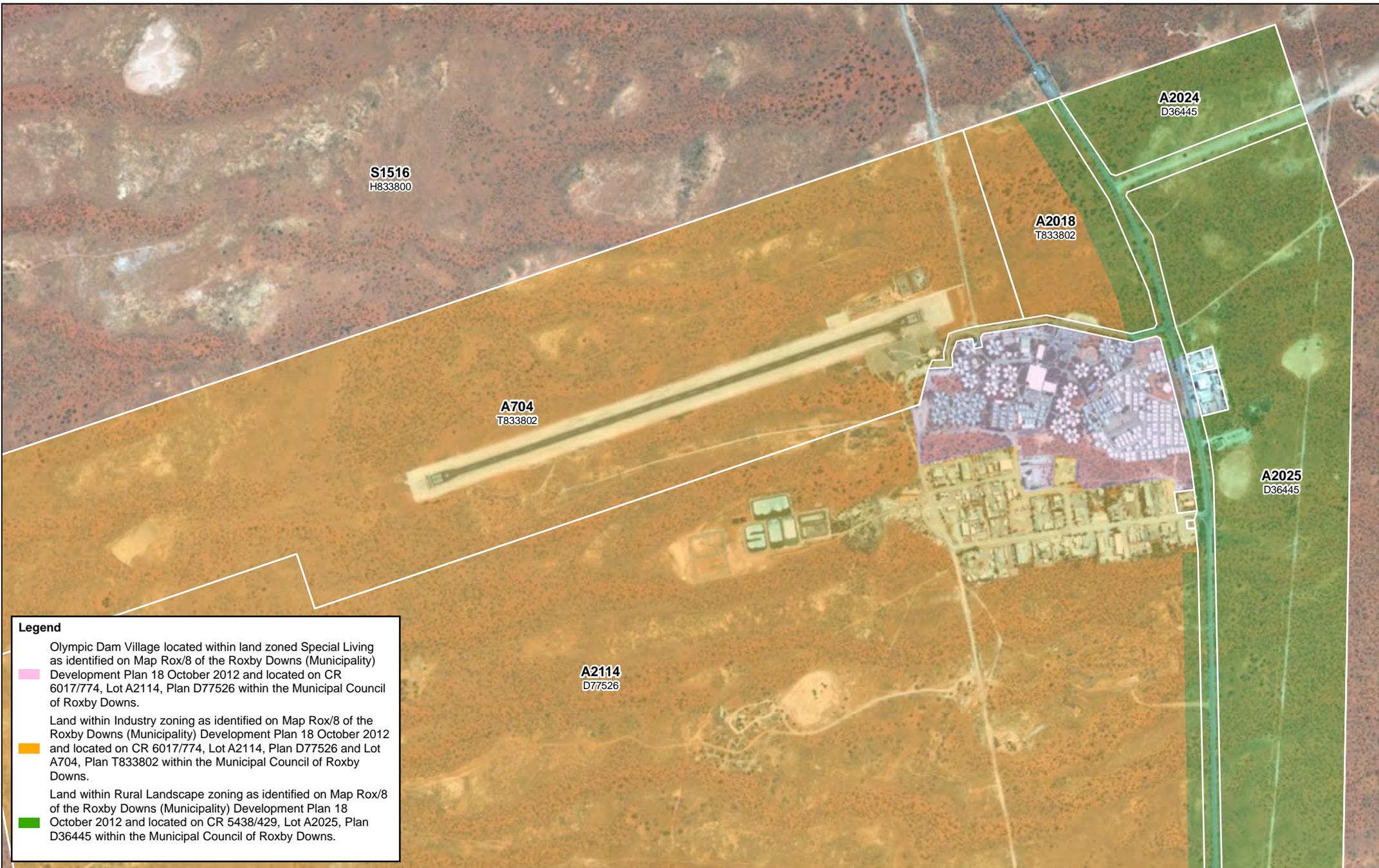


0 400 800 m
 Transverse Mercator Projection
 GDA 1994 MGA Zone 53

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**ZONING BOUNDARIES OF ROXBY DOWNS
 VILLAGE AND SURROUNDS**

Drawn: A. Smith	Date: 24-Jan-19	Revision: 0	FIGURE 1-7
Checked: N. Patten	Filename: F3.3_Roxby Village.mxd		



Legend

Olympic Dam Village located within land zoned Special Living as identified on Map Rox/8 of the Roxby Downs (Municipality) Development Plan 18 October 2012 and located on CR 6017/774, Lot A2114, Plan D77526 within the Municipal Council of Roxby Downs.

Land within Industry zoning as identified on Map Rox/8 of the Roxby Downs (Municipality) Development Plan 18 October 2012 and located on CR 6017/774, Lot A2114, Plan D77526 and Lot A704, Plan T833802 within the Municipal Council of Roxby Downs.

Land within Rural Landscape zoning as identified on Map Rox/8 of the Roxby Downs (Municipality) Development Plan 18 October 2012 and located on CR 5438/429, Lot A2025, Plan D36445 within the Municipal Council of Roxby Downs.



0 250 500 m
 Transverse Mercator Projection
 GDA 1994 MGA Zone 53

Service Layer Credits:
 Source: Esri, DigitalGlobe,
 GeoEye, Earthstar
 Geographics, CNES/Airbus
 DS, USDA, USGS,
 AeroGRID, IGN, and the
 GIS User Community

ZONING BOUNDARIES OF OLYMPIC DAM VILLAGE AND SURROUNDS

Drawn: A. Smith	Date: 24-Jan-19	Revision: 0	FIGURE 1-8
Checked: N. Patten	Filename: F3.4_OD Village.mxd		

MAJOR DEVELOPMENT PROCESS AND ROLE OF GUIDELINES

The major development assessment process enables the Minister for Energy and Mining, the Minister responsible for the *Roxby Downs (Indenture Ratification) Act 1982* (the Indenture Minister), and the Minister for Planning to utilise impact assessment as a strategic tool.

Impact assessment enables the holistic consideration of proposals that might otherwise be of a nature or scale that is not expected through the regular development assessment process and/or council development plan(s).

The major development assessment process has several steps:



These guidelines are prepared to inform the preparation of the EIS. They set out the assessment issues associated with the proposal along with their scale of risk as determined by the Indenture Minister and the State Planning Commission.

A proponent must prepare an EIS in accordance with the Guidelines and should specifically address each guideline.

The Indenture Minister and SPC intends that each guideline to be outcome focused which may be accompanied by suggested assessment approaches. These suggestions are not exhaustive, and may be just one of a wide range of methods to consider and respond to a particular guideline.

The EIS should detail any expected environmental, social and economic effects of the development, and the extent to which the development is consistent with the provisions of the Councils Development Plan, the Planning and Design Code, the Planning Strategy and any matter prescribed by the Regulations under the Act.

Whilst not mandatory for this EIS as the proposal been declared under the Development Act, the EIS may wish to address the State Planning Policies given they are now a relevant planning instrument.

ODC is to submit the completed EIS to the Indenture Minister and Minister for Planning for public release and referral to the relevant council(s) and government agencies for comment.

An opportunity for public comment will occur when the completed EIS is released. Public exhibition is undertaken for a minimum 30 business days. An advertisement will be placed in *The Advertiser* and local newspapers inviting submissions.

Copies of the submissions from the public, relevant council(s) and government agencies will be provided to the proponent.

ODC must then prepare a 'Response Document' to address the matters raised during the public exhibition period.

The final step is to prepare an assessment report. Upon a decision the Assessment Report and the Response Document will be available for inspection and purchase at a place determined by the Minister for Energy and Mining and the Minister for Planning for a period determined by both Ministers.

Availability of each of these documents will be notified by advertisements in *The Advertiser* and local newspapers. A copy of the EIS, Response Document and the Assessment Report will be provided to each of the Councils.

In this circumstance, due to the Indenture the Minister for Energy and Mining makes the final decision under section 48 of the Development Act. In deciding whether the proposal will be approved and any conditions that will apply, the Indenture Minister must have regard to:

- provisions of the appropriate Development Plan or Planning and Design Code;
- the Development Act and Regulations;
- if relevant, the Building Code of Australia;
- the South Australian Planning Strategy, including the Integrated Land Use and Transport Plan;
- the EIS, Response Document and the Assessment Report;
- the *Environment Protection Act 1993*; and
- any other relevant government policy and/or legislation (including, in this case, the *Radiation Protection and Control Act 1982* and *Roxby Downs (Indenture Ratification) Act 1982*).

The Indenture Minister can at any time indicate that the proposal will not be granted authorisation. This may occur if the proposal is inappropriate or cannot be properly managed. This is commonly referred to as an **early no**.

Australian Government involvement in the assessment process

On 19 March 2020, a delegate of the Australian Minister for the Environment made the decision that the proposed action requires assessment and approval under the EPBC Act before it can proceed (EPBC 2019/8570). This was because the proposed action was found likely to have, or may have, a significant impact on three matters of national environmental significance that are protected under Part 3 of the EPBC Act. They are:

- Listed threatened species and communities (section 18 & section 18A);
- Listed migratory species (section 20 & section 20A); and
- The environment because the proposal is a nuclear action (section 21 & section 22A).

For the first two points, the proposal was found likely to have a significant impact on the following matters protected by the EPBC Act (but may not be limited to):

- The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin (GAB) – Endangered
- Salt Pipewort, Button Grass (*Eriocaulon carsonii*) – Endangered
- Plains Rat, Palyoora (*Pseudomys australis*) – Vulnerable
- Dusky Hopping-mouse, Wilkiniti (*Notomys fuscus*) – Vulnerable
- Thick-billed Grasswren (*Amytornis modestus*) – Vulnerable
- Curlew Sandpiper (*Calidris ferruginea*) – Critically Endangered (also listed as migratory)
- Plains Wanderer (*Pedionomus torquatus*) – Critically Endangered
- Dwarf Desert Spike-rush (*Eleocharis papillosa*) – Vulnerable
- *Frankenia plicata* – Endangered
- Sharp-tailed Sandpiper (*Calidris acuminata*) – Migratory
- Common Sandpiper (*Actitis hypoleucos*) – Migratory
- Red-necked Stint (*Calidris ruficollis*) – Migratory
- Common Greenshank (*Tringa nebularia*) – Migratory

It has been determined that the proposal will be assessed through an Accredited Assessment Process under section 87(1) of the EPBC Act. This process accredits the South Australian Major Development assessment process for the purpose of assessing this proposal.

In accordance with the Accredited Assessment Process the proposal will undergo a streamlined assessment process coordinated with the Australian Government Department of Agriculture, Water and the Environment. This means there will only be one environmental impact assessment document (EIS) prepared, one period of public consultation undertaken, and one response/supplementary document prepared to satisfy the legislative requirements for the assessment of the proposal by both jurisdictions.

Following assessment, the State of South Australia will provide an Assessment Report to the Australian Minister for the Environment, or their delegate, who will then make a (separate) decision on whether or not to approve the proposed action under Part 9 of the EPBC Act, and if so, what conditions to attach.

The Australian Government Department of Agriculture, Water and the Environment has had input into the preparation of these guidelines in regard to issues related to the EPBC Act.

ENVIRONMENTAL IMPACT STATEMENT (EIS)

The EIS should be presented in terms that are readily understood by the general reader. Technical details should be included in the appendices.

The EIS will include the following:

Summary

The EIS should include a concise summary of the matters set out in Section 46B of the *Development Act 1993* and Schedule 4 of the *Environment Protection and Biodiversity Conservation Act Regulations 2000*, and include all aspects covered under the headings set out in the Guidelines, in order for the reader to obtain a quick but thorough understanding of the proposal and the resulting environmental impacts.

Introduction

The introduction to the EIS should cover the following:

- background to, and objectives of, the proposal
- details of the proponent
- staging and timing of the proposal, including expected dates for construction and operation
- relevant legislative requirements and approval processes
- purpose and description of the EIS process.

Need for the Proposal

A statement of the objectives and justification for the proposal, including:

- the specific objectives that the proposal is intended to meet, including market requirements
- expected local, regional and state benefits and costs, including those that cannot be adequately described in monetary or physical terms (e.g. effects on aesthetic amenity)
- a summary of environmental, economic and social arguments to support the proposal, including the consequences of not proceeding with the proposal.

Description of the Proposal

The description of the proposal should include the following information:

- the nature of the proposal and location (including identifying project elements/components)
- a project plan to outline objectives, constraints, key activity schedule and quality assurance
- site layout plans (including indicative land division plan, if relevant)
- the construction and commissioning timeframes (including staging)
- a description of the existing environment (including the immediate and broader location)
- a description of the current operations including the current processing regime, land use activities occurring in the area (including BAU works and activities proposed to be constructed between now and a decision on this application)
- a description of works required for the future staged increases and the need to utilise, upgrade, replace, amend or expand any of the current BAU operations.
- details of all buildings and structures associated with the proposal
- details of any other infrastructure requirements and availability
- details of the construction methods to be used
- details on the operation of the proposal, including proposed maintenance and monitoring programs
- the relevant Development Plan/Planning and Design Code zones
- management arrangements for the construction and operational phases (including details of the Environmental Protection and Management Program framework)
- a contingency plan for delays in construction.

Assessment of expected environmental, social and economic effects

The assessment of effects should include all issues identified in these guidelines and cross referenced to supporting technical references.

Avoidance, mitigation, management and control of adverse effects

The proponent's commitment to meet conditions proposed to avoid, mitigate, satisfactorily manage and/or control any potentially adverse impacts of the development on the physical, social or economic environment, must be clearly stated as part of the EIS.

The design of the proposal should be flexible enough to incorporate changes to minimise any impacts highlighted by this evaluation or post-operation monitoring programs.

Consistency with Government policy

The Development Act requires the EIS to state the consistency of the expected effects of the proposed development:

- with the relevant Development Plan, Planning and Design Code and Planning Strategy; and
- with the objects of the *Environment Protection Act 1993*, the general environmental duty and relevant environment protection policies.

Plans and forms

- Current **Certificate(s) of Title**
- **Context and locality plans** should illustrate and analyse the existing environment and site conditions and the relationship of the proposal (including staged increases) to surrounding land and buildings. The plan should be drawn to a large scale and be readily legible. The plan(s) should indicate:
 - any neighbouring buildings, infrastructure or facilities, including identification of all nearest sensitive receptors and the likely use of existing or proposed neighbouring buildings (e.g. dwelling, farm outbuildings, shop, office)
 - location of any watercourse, dams, underground wells and/or any other environmentally sensitive areas
 - location of any state heritage and cultural heritage in relation to the site
 - location of any protected areas proclaimed under the *National Parks and Wildlife Act 1972*
 - existing native vegetation, regulated or significant trees
 - known sites for protected, threatened or vulnerable species, including migratory species, on the site, the adjoining land and wider Great Artesian Basin environment
 - known sites for threatened ecological communities that could potentially be affected by increased use of Great Artesian Basin water extraction
 - existing roads and access tracks (public & private) and
 - any other information that would help to set the context for the locality.
- **Site plan(s)** (drawn at a scale of 1:100 or 1:200) clearly indicating all proposed buildings, structures and works (including staged increases).
- **Elevations** (drawn at a scale of 1:100 or 1:200) showing all sides of the buildings, structures and works with levels and height dimensions provided in Australian Height Datum.
- **Cross sections** of the buildings, structures and works, including stockpile and storage facilities showing ground levels, floor levels, ceiling heights and maximum height in Australian Height Datum.
- Any **technical or engineering drawings** and specifications for all components of the proposal including geotechnical data, details of cut and fill and depth to groundwater, both as metres below ground level (mbgl) and Australian Height Datum (AHD) should be included for all aspects of the proposal (i.e. mining, processing, waste management and rehabilitation/closure).

Specialist reports and details

All reports and details required below should, where relevant, use the same baseline. The baseline for each study should include existing BAU and any ongoing discrete works or activities that have or are likely to commence by mid-2021. Where relevant, reports and plans should include an assessment of failure scenarios with contingency measures where failure can lead to a high impact event.

- An **Economic Impact Assessment** that describes the existing environment in which the proposal is set and assesses the magnitude of change to the economic environment resulting from the proposal.
- A **Surface and Groundwater Impact Assessment** that describes the hydrogeological regime of the clause 28 land area and the likely zone of impact from groundwater extraction from the Great Artesian Basin. The report will include an assessment of the potential impacts of the proposal on local and regional waters and the Great Artesian Basin cumulative assessment of the operations and of all water extraction and identify potential risks and constraints associated with the operation of OD–RDS and continuing BAU. Information should be included about current conditions of groundwater at the site including any areas of known site contamination and an assessment of background concentration of potential contaminants of concern.
- A **Radiation Assessment** that describes the baseline radiological characteristics of the proposal area and the sources, pathways and receptors of radiation exposure from the proposal. The report must include estimates of the radiation dose to workers, the public and non-human biota from the proposal during operation and after rehabilitation. All scenarios, assumptions, modelling and data used to estimate radiation doses must be included in the report.
- An **Air Quality Impact Assessment** for all potential sources of air pollution from cumulative BAU and OD–RDS and continuing BAU operations. The report should include modelling undertaken in accordance with the EPA publication ‘Ambient air quality assessment’ and assesses consistency with the requirements of the *Environment Protection (Air Quality) Policy 2016*. Estimates should be based on the maximum possible mining and processing rates (for example greater than or equal to 15 Mtpa noting that more low grade ore needs to be mined and processed to achieve 350,000 tpa Cu and associated products) and assuming worst case scenario for the construction of tailings dams.
- A **Cultural Heritage Management Assessment** prepared by an appropriately qualified heritage expert that includes an assessment of the potential impact of the proposal on Aboriginal cultural heritage. The assessment must outline measures to be taken before, during and after the proposed development in order to manage and protect Aboriginal cultural heritage. The assessment should outline how the Traditional Owners will be engaged to help identify sites, objects and remains, and how they will be managed and protected.
- A **Fauna and Flora Impact Assessment** (including **Native Vegetation Clearance Data Report**) prepared by an Accredited Consultant approved by the Native Vegetation Council. The assessment should undertake a survey of the vegetation and fauna (including EPBC Act Listed threatened species and communities), an assessment of aquatic and wading bird species likely to interact with tailings dams including predicted encounter rates per species based on data collected from existing ponds, compliance with the mitigation hierarchy and any significant environment benefit proposed.
- A **Sustainability and Climate Change Assessment** prepared by a suitably qualified environmental expert. The assessment should measure the ecological footprint of the OD–RDS and continuing BAU and address sources of greenhouse gas emissions and the implications of climate change, the use of renewable or alternative technologies, energy and water efficiency measures, greenhouse gas reductions and other sustainability initiatives during construction and operational phases.
- A **Waste Management and Minimisation Assessment** that separates out the mining, extraction and processing wastes from those derived from staff facilities and mining camp activities. The assessment should detail the sources and types of waste streams including rock waste, tailings, commercial and industrial waste, construction and demolition waste, hazardous waste and any municipal solid waste. It should also provide details of the location of waste management storage, stockpiling and treatment areas (including the separation of waste streams, such as recyclables, hard waste and low level contaminated waste) and disposal facilities located on site or within laydown areas and provide details of how these facilities will be serviced and managed. The assessment should have regard to the waste hierarchy for avoiding waste altogether, reducing and recycling quantities of waste that are unavoidable prior to recovery and disposal. The assessment should also refer to contingency arrangement for hazardous wastes without a clear waste management option and design and management measures that will be used to minimise the risk of leakages/spills and prevent site contamination.
- A **Social Impact Assessment** including an assessment of the composition of the workforce and the likely positive and negative social impacts as a result of an increase in population at Roxby Downs township. Following this assessment, assess the likely impacts on housing, accommodation, health services, education and other services located within Roxby Downs and the region, the impact on existing pastoral land uses and

other affected land holders, the potential for local and statewide communities and business to tender contracts for services and supplies.

- A **Transport and Access Impact Assessment** prepared by a suitably qualified traffic and access planner/engineer. The assessment should evaluate current and proposed access arrangements including the effect on the arterial road network and car parking, as well as vehicle interface with the local road network. Any assessment must include the traffic and access impact for the construction period as well as any ongoing operations and maintenance including details of the traffic/transport vehicle sizes/movements outside of normal gazetted heavy vehicles.
- A **Hazard Assessment** that considers requirements both during the construction and operational phases - including measures to identify, assess and control hazards at and to/from the site, resources and training required, controls to measure risk, options to utilise and coordinate with other operations in the region/area, and cost recovery.
- A formal **Risk Assessment**, using a commonly accepted methodology that meets Australian Standards (for example a Failure Modes Effects Assessment, that clearly sets out all the risk associated with the proposal, and their interrelationship. This assessment will be used to inform proposed monitoring and mitigation activities.
- A **Closure and Rehabilitation Assessment** that describes the proposed long-term strategy for closure, decommissioning and rehabilitation of existing and proposed mining and mineral processing infrastructure, and associated waste management facilities, including the long-term chemical and physical stability of such facilities. The assessment should describe, among other things, how to achieve closure outcomes and objectives, how the 'design-for-closure' principles will be adopted for all mining and mineral processing infrastructure and associated waste management facilities so as to support the long-term closure and rehabilitation outcomes and objectives, the post-closure land use and fate of key supporting infrastructure (including but not limited to: ODV, Roxby Downs Village, airport, GAB pipeline, electricity infrastructure etc.). The assessment should be prepared envisaging progressive closure of the mine and associated facilities. The assessment should also include reference to detailed site contamination investigations and remediation options/strategies to be undertaken at mine closure.
- A **Soil Erosion and Drainage Management Assessment** that describes the site characteristics, including the existing topography and runoff characteristics. The assessment should describe the soil erosion and drainage management measures proposed for the site necessary to prevent contaminated runoff from leaving the site during construction (including any opportunities for retention and reuse). The assessment should include details of how soil erosion and drainage management measures may alter as works continue and the landscape changes, as well as monitoring and maintenance requirements for the proposed measures.
- An **Energy Supply Management Assessment** that describes the total anticipated energy needs of the Olympic Dam operations and existing or proposed infrastructure to meet the energy demand, as well as confirming compliance with all relevant legislation governing the energy supply in South Australia. The assessment should describe risks associated with energy supply to the facility, but also risks to the broader electricity supply system in South Australia. The assessment needs to specifically address how the electrical infrastructure at the Olympic Dam operation may need to be configured to assist in mitigating these risks to the State, with particular focus on how the facility can contribute to managing system frequency deviations (under and over frequency) in South Australia. Not excluding other matters, the assessment needs to consider how Olympic Dam will contribute to maintaining South Australia's power security to the satisfaction of the Technical Regulator.
- A **Noise Assessment** prepared by a suitably experienced, professional acoustic engineering consultant demonstrating that worst case predicted noise from the proposal (including construction and operational phases) will meet the standards specified in the *Environment Protection (Noise) Policy 2007* (the Noise Policy). The assessment should include all reasonable and practicable measures to minimise noise impacts on sensitive receivers if the noise goals in the Noise Policy are predicted to be exceeded.
- A **Vibration Assessment** prepared by a suitably experienced, professional acoustic engineering consultant demonstrating that worst case predicted vibration from the proposal (including construction and operational phases) will meet the General Environmental Duty as described in section 25 of the *Environment Protection Act 1993*.

- A **Construction Environmental Management Assessment** that describes how construction will be managed to mitigate negative impacts on the environment, and public health and amenity. The assessment should consider potential and existing contamination on the site and how this will be impacted by construction, and what risk it poses to human health and the environment during construction.
- An **Operational Environmental Management Assessment** that describes how operations, in particular maintenance regimes, will be managed to mitigate negative impacts on the environment, and public health and amenity, and how any ongoing environmental management and monitoring requirements will be implemented.
- Detailed description of **Mine Management** that includes the proposed mining location and method (including underground and the quarry), volumes, durations, processing techniques (including flow diagrams). Volumes, (other inputs/consumables required for example water, energy, reagents); waste management (including tailings storage facilities, back-fill materials, waste rock facilities, and municipal facilities); final products to be produced and sold. Description of management systems (for example WHS systems, ventilation systems etc.) and application of legislative requirements (in particular the *Work Health and Safety Act 2012* and *Work Health and Safety Regulations 2012*).

Sources of information

- All sources of information (for example reference documents, literature services, research projects, authorities consulted) should be fully referenced, and reference should be made to any uncertainties in knowledge. Where judgements are made, or opinions given, these need to be clearly identified as such, and the basis on which these judgements or opinions are made need to be justified. The expertise of those making the judgements including the qualifications of consultants and authorities should also be provided.
- Any technical and additional information relevant to the EIS that is not included in the text should be included in appendices.
- It is **RECOMMENDED** that the EIS consider issues that may generate concerns based on inaccurate or outdated perceptions. The information provided should explain key concepts in a factual manner. This can help to provide base level information to assist with community understanding of the proposal.

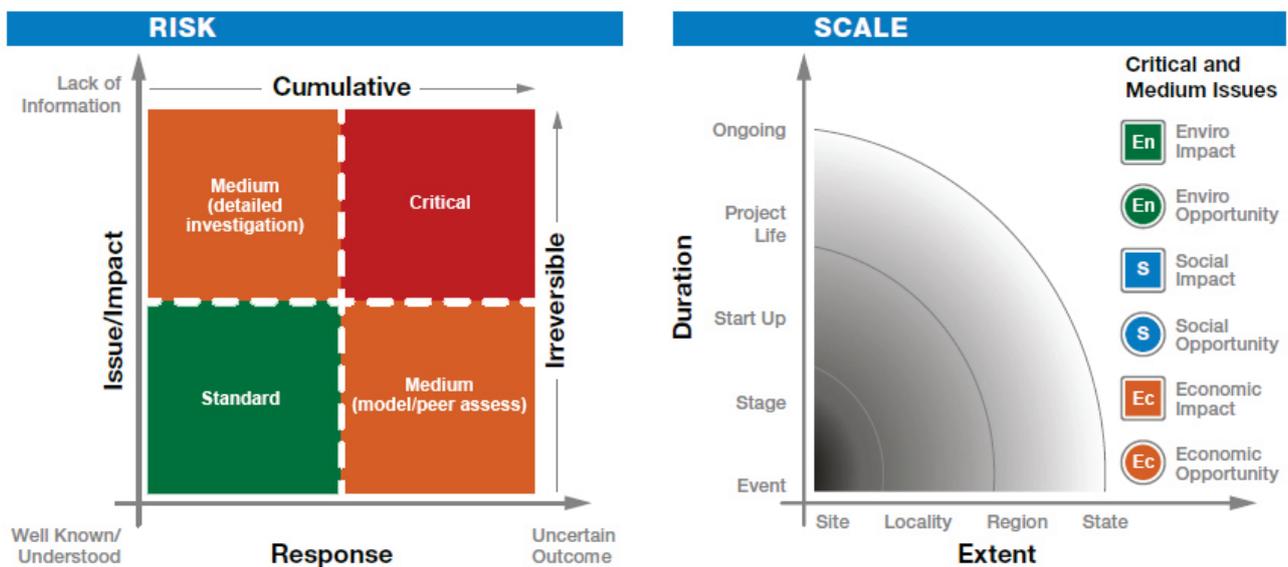
NOTE: The investigative requirements of the EIS do not negate the need for the proponent to obtain all necessary licences, permits and/or management plans prior to undertaking any investigations or works in relation to this EIS. It also does not negate the need for the proponent to comply with any legislative obligations or duty of care under relevant legislation.

ASSESSMENT

Impact assessment is an important tool that enables the consideration of proposals that might otherwise struggle to be properly or fairly addressed under the 'normal' assessment system.

In setting these Guidelines, the Indenture Minister and the State Planning Commission has considered the scale of issues associated with the proposal and determined whether they represent issues or opportunities. The potential impacts and issues have then been organised according to the level of work and type of attention required by the proponent: either standard, medium or critical:

- Where the issue is well known and the response is well understood then the risk assessment is classed as **'STANDARD'**
- Where work is required to address the issue but the risk is likely to be manageable with additional information then the risk assessment is classed as **'MEDIUM'**.
- Where information about the issue is lacking and the response is unclear, the issue is classed as **'CRITICAL'**.



In applying the prescribed criteria listed in regulation 63 of the *Development Regulations 2008*, the issues and impacts identified by the Indenture Minister and the State Planning Commission as requiring standard, medium or critical level assessment are listed below. Each requirement includes a description of the issue/impact and a description of the action or investigation needed, including whether that requirement, as a result of the location of each component of the proposal, is applicable under Clause 28 land, non-Clause 28 land, or both.

To assist with the assessment of the EIS the proponent is requested to provide a table (as an appendix) that cross references each guideline requirement (action or investigation needed) with the relevant section and page of the EIS.

No.	Issue/Impact	Description	RISK		SCALE		LEVEL OF ASSESSMENT
			Issue/Impact	Response	Duration	Extent	
	Matters of National Environmental Significance (MNES) under the EPBC Act	The proposal has been deemed a controlled action due to potential impacts on MNES.	Based on the information provided by the proponent, there is potential for significant impacts on MNES, specifically threatened species (or their habitat) and ecological communities, migratory species and the environment as the action is a nuclear action (including uranium mines).	The current plan does not provide a detailed description of the impacts on the MNES and the measure to avoid or mitigate impacts during construction and ongoing operation.	During construction and ongoing	National	The receiving environment and MNES are highly sensitive to change. The MNES require further survey and impact assessment. = CRITICAL
1	Economic effects	The proposal will have an impact on the State's economy during construction, operation and closure/rehabilitation.	The potential economic effects of the State from the creation of 1800 jobs during construction and 600 ongoing jobs along with the multiplier effect and the effect on the Roxby Downs community and the State more broadly.	The current plan does not provide an in depth analysis of: <ul style="list-style-type: none"> • Impact of the expansion on the economy • Impacts of employment generation and ability for the State to service the work force requirements • The economic benefits and • The flow on effects for suppliers, communities etc. 	During construction, operation, closure.	Regional (Far North), State and National	<u>Clause 28</u> A full economic assessment that details the impact on the economy (production volumes and jobs) and government royalties including scenario testing. = CRITICAL <u>Non-clause 28</u> Further information is required on the direct and indirect economic impacts on the Roxby Downs community. = CRITICAL
2	Water supply effects	The OD-RDS and continuing BAU proposes an increase in processing water, along with water for the township. In addition groundwater is intercepted and impacted during mining operations. Increased groundwater extraction from the Great Artesian Basin (GAB) may result in immediate and long-term impacts on the environment and other GAB uses.	Continuing and increased extraction from the GAB has the potential to impact on pastoral and other users along with the environment including the GAB spring ecosystem.	The current plan does not provide a detailed analysis of the impacts of current and increased water extraction on a resource that is in a slow rate of natural decline. Alternatives should also be investigated.	During constructions and ongoing	Regional (Far North), State and National	<u>Clause 28</u> Further information and analysis of the impact of continued and increased groundwater extraction from the GAB is required. = CRITICAL <u>Non-clause 28</u> Wider impact on water supply to the Roxby Downs council area, including the new accommodation villages needs to be further explored. = CRITICAL
3	Radiation effects	The proposal involves the processing of ore containing elevated levels of uranium and other naturally occurring radioactive material that may result in long-term effects on human health and the environment.	The proposal has the potential to increase radioactive emissions that may lead to increased exposures to workers, the public and the environment.	The current plan does not provide details on the existing radiation environment, any radiological impact assessment and the management and environmental outcomes	During construction and ongoing	Local (on the SML) and within the Roxby Downs Council area	<u>Clause 28</u> The processing of ore containing uranium negatively impacts the receiving environment. Need for further assessment including potential impacts on the community, environment and workers. = CRITICAL

No.	Issue/Impact	Description	RISK		SCALE		LEVEL OF ASSESSMENT
			Issue/Impact	Response	Duration	Extent	
							<u>Non-clause 28</u> Further information is required on any radioactive sources off SML, in particular any uses, such as the industrial areas, that may receive or maintain components that may be radioactive. = CRITICAL
4	Air quality effects	The proposal has the potential to increase air pollution emissions through an increased scale of production and/or change in ore grade that may result in immediate and long-term effects on humans and the environment.	The change in ore grade and the proposed increase in production has the potential to result in increased air emissions including SO ₂ , NO _x and hydrogen sulphides, particulates from the quarry, saline aerosols and other fugitive emissions.	The current plan does not provide a detailed assessment of the potential impacts of the mining and processing facilities to the Olympic Dam Village and Roxby Downs township or the environment.	During construction and ongoing	Local (on SML and infrastructure corridors)	<u>Clause 28 only</u> The receiving environment is negatively impacted by the processing of ore resulting in increased air pollution. Need for further assessment including potential impacts on the environment and humans. = CRITICAL
5	Impacts on cultural heritage	The proposal has the potential to impact on sites/locations of Aboriginal or non-Aboriginal heritage through disturbance during construction. Additionally, there are Native Title implications associated with Crown land.	The proposal has the potential to impact Aboriginal and non-Aboriginal heritage values, particularly in areas where new land clearance will occur.	The current plan does not provide a detailed assessment of the existing Aboriginal and non-Aboriginal heritage environment, an assessment of the potential impacts, all relevant activities, and the proposed management measures and environmental outcomes and proposed monitoring measures and criteria is required.	During construction and ongoing	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs Council area)	<u>Clause 28</u> The issue is well understood on the SML and within the infrastructure corridors. However, more specific information is required on the impacts of the proposal. = CRITICAL
							<u>Non-clause 28</u> Further information is required on the potential impact of development within the non-clause 28 land. = CRITICAL
6	Effects on flora and fauna	The proposal, in particular the water pipeline and electricity infrastructure, traverses significant stands of native vegetation and fauna including possibly threatened species and ecological communities.	The proposal is likely to impact on flora and fauna through trenching for pipelines, clearance under electricity lines and development works on the SML and within Roxy Downs region during both OD-RDS and continuing BAU.	The current plan does not provide a detailed assessment of the potential impacts on flora and fauna and the proposed management measures and environmental outcomes appropriate.	During construction and ongoing.	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs Council area)	<u>Clause 28</u> The receiving environment is highly sensitive to change. This issue is well understood within the SML and infrastructure corridors. Need for further assessment on the location, extent, condition and impact on native fauna and any opportunity for vegetation offsetting. = CRITICAL

No.	Issue/Impact	Description	RISK		SCALE		LEVEL OF ASSESSMENT
			Issue/Impact	Response	Duration	Extent	
							<p><u>Non-clause 28</u> The receiving environment is highly sensitive to change. Need for further assessment on the location, extent, condition and impact on native fauna and any opportunity for offsetting. = CRITICAL</p>
7	Impacts on sustainability and climate change	The proposal has the potential to have significant impact on sustainability and greenhouse gas emissions during continuing BAU and during the expansion.	The proposal has the potential to create significant greenhouse gas emissions. The proposal identifies opportunities for carbon reduction, increased energy efficiency, increase renewable energy and greenhouse gas abatement.	The current plan does not provide a detailed assessment of the potential impacts of greenhouse gas emissions and the proposed management measures and appropriate environmental outcomes.	During construction and ongoing.	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs Council area)	<p><u>Clause 28</u> Further information is required on the sustainability objectives for the proposal including more details on power usage. = CRITICAL</p> <p><u>Non-clause 28</u> Further information is required on the sustainability objectives for the portion of the development location with the Roxby Downs area. = MEDIUM</p>
8	Waste management	The proposal requires the use, establishment or expansion of waste management facilities for a variety of wastes.	The proposal will increase the generation of radioactive wastes, (including tailings material), sewage, general solid waste, recyclable waste and contaminated waste.	The current plan does not provide a detailed assessment of how waste will be managed on site, the potential impacts of management of waste and the proposed management measures and environmental outcomes appropriate.	During construction and ongoing.	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs Council area)	<p><u>Clause 28</u> Further information is required on the expansion and creation of new waste storage areas. = CRITICAL</p> <p><u>Non-clause 28</u> Further information is required on the waste management regime for the development within the Roxby Downs Council area (including ODV) such as increased wastewater and hard refuse and any impact on the current management. = MEDIUM</p>

No.	Issue/Impact	Description	RISK		SCALE		LEVEL OF ASSESSMENT
			Issue/Impact	Response	Duration	Extent	
9	Effects on communities	The proposal has the potential to affect the local community during construction and through the various stages of OD–RDS and continuing BAU establishment.	The proposal has the potential for significant economic benefits for South Australia. The changes to the social environment that may result from the proposal are proposed to be managed consistent with the approach of the current Stakeholder Engagement Plan and Social Effects Monitoring Program.	The current plan does not provide a detailed assessment of the wider effects on local and regional communities including an assessment to all potential impacts and the proposed management measures.	During construction and ongoing.	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs council area and Andamooka)	<u>Clause 28</u> A full social impact assessment is required including the composition of the work force, accommodation requirements, effects on public health, proposed community consultation. = CRITICAL
							<u>Non-clause 28</u> Further information is required on the direct and indirect social impacts on the Roxby Downs community. = CRITICAL
10	Traffic and transport effects	The proposal requires access for the transportation of large modules and construction material to site, including within the Roxy Downs Township, and ongoing transportation of materials to and product from these sites.	The proposal has the potential for increase in the movement of people and material/products to/from the mine site. Freight transport between Adelaide and Olympic Dam is expected to increase with materials to support mining operations (inbound) and an increase in the amount of copper, uranium and silver products (outbound). The impacts upon the transport system (all modes) require assessment to determine the asset improvements, asset management/maintenance requirements, and operational management requirements.	The current plan does not provide a detailed transport assessment that involves end-to-end supply chain (input and output) analysis to determine transport impacts, solutions, proposed management measures and improvement needs.	During construction and ongoing.	Regional (within Roxby Downs and Andamooka), State and National	<u>Clause 28</u> Further information is required on the impact of potential increased movement of people and material/products to/from the mine site. A transport assessment that involves end-to-end supply chain (input and output) analysis to determine transport impacts, solutions, proposed management measures and improvement needs. = MEDIUM
							<u>Non-clause 28</u> Further information is required on the impact of increased traffic (including air traffic) between Roxby Downs and the mine due to increased work force. = MEDIUM
11	Hazard risk	The construction and operation of OD–RDS and continuing BAU has the potential to involve a range of general and specific risks, including a risk to public safety.	Associated risks include: <ul style="list-style-type: none"> Plant operation Mining operation Handling of hazardous material Fire or explosion risk Public safety Number of people living in the community. 	The current plan does not provide a detailed assessment of the potential risks from the various components of the proposal.	During construction and ongoing	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs)	<u>Clause 28</u> The issue is well understood on the SML and within the infrastructure corridors. However more specific information is required on the impacts of the proposal on potential hazards. = MEDIUM

RISK			SCALE			LEVEL OF ASSESSMENT	
No.	Issue/Impact	Description	Issue/Impact	Response	Duration	Extent	
							<u>Non-clause 28</u> Further information is required to understand the hazard risk from the proposed components within the Roxby Downs council area. = STANDARD
12	Effects on the local groundwater	The proposal, being an underground mine, has the potential to impact on groundwater at the mine site.	The proposed expansion and continuing BAU has the potential to cause some changes in local groundwater levels and water quality. Additional tailings storage facility (TSF) could cause further groundwater mounding, potentially offset by drawdown on the local aquifer from dewatering the expanded underground operation.	The current plan does not provide a comprehensive assessment of the proposal on the local groundwater environment. The plan refers to an updated groundwater model.	During construction and ongoing.	Local (on the SML and infrastructure corridors).	<u>Clause 28 only</u> Further information on the impacts on local groundwater will be managed is required, including the cumulative impact of additional TSFs on local groundwater. = MEDIUM
13	Decommissioning, transitional and rehabilitation arrangements	The proposal involves the decommissioning and establishment of new plant and equipment during the mines operation phase.	The proposed expansion and continuing BAU requires the decommissioning and replacement of plant and equipment. Decommissioning and transition will need to be well planned to ensure risks such as outages are minimised.	The current plan does not provide a comprehensive assessment of how decommissioning, transition and, where relevant rehabilitation, will occur.	During construction, ongoing and upon closure	Local (on SML and infrastructure corridors)	<u>Clause 28 only</u> The issue is understood on the SML and within the infrastructure corridors. However more specific information is required. = MEDIUM
14	Closure management and rehabilitation arrangements	The proposal requires the closure and rehabilitation at end of mine life, to negate long-term environmental impacts and liabilities. The use of 'design for closure', progressive rehabilitation and ongoing rehabilitation investigations and studies throughout the operations life as key principle.	The enlarged infrastructure and operational footprint that will result from the proposal will increase the closure and rehabilitation requirements but are not expected to alter the outcomes of the existing Closure Management and Rehabilitation Plan (CMRP).	The current plan proposes a review and update of/to the existing CMRP to include the new developed areas.	During construction and upon closure	Local (on SML and infrastructure corridors)	<u>Clause 28</u> Further information on how proposal has or will be designed for closure is required. = MEDIUM <u>Non-clause 28</u> Further information on how proposal has or will be designed for closure is required. = MEDIUM

No.	Issue/Impact	Description	RISK		SCALE		LEVEL OF ASSESSMENT
			Issue/Impact	Response	Duration	Extent	
15	Effects on the physical environment and land use	The proposal has the potential to disturb landforms and may result in immediate and long-term effects on land use.	The proposed expansion and continuing BAU is consistent with the existing land uses and would not have a material impact on other land users, including pastoralists. Proposed activities at or near Olympic Dam Village and Roxby Downs are expected to be consistent with the Development Plan and existing or envisaged land uses.	The current plan does not provide a comprehensive assessment of the expansion on existing land uses within the area.	During construction and ongoing	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs)	<u>Clause 28</u> Further information is required on the physical environment and on the possible impacts of land uses, as they relate to the SML and infrastructure corridors as a result of the proposal. = STANDARD
							<u>Non-clause 28</u> Further information is required on the physical environment and on the possible impacts of land uses, as they relate to Roxby Downs as a result of the proposal. = STANDARD
16	Effects on surface water	The proposal has the potential to increase impervious surface areas and increase concentration of metals and other potential contaminants in stormwater run-off.	On the SML, stormwater is collected and contained within an enclosed system however the proposed continuing BAU and expansion increase in mining processing has the potential to increase the likelihood of spills and potential contaminants entering the stormwater system.	The current plan does not provide a comprehensive assessment on the proposal on the stormwater network located within the SML and also off site within the municipality, during construction and operation.	During construction and ongoing.	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs)	<u>Clause 28</u> Further information on the management of stormwater on site during construction and operation are required. = STANDARD
			Construction and operation of accommodation and other associated infrastructure within Roxby Downs council area could result in changes in stormwater flows.				<u>Non-clause 28</u> Further information on the management of stormwater on within the Roxby Downs council area during construction and operation are required. = STANDARD
17	Visual impacts	The proposed OD–RDS and continuing BAU will be a significant increase in mining and processing operations at Olympic Dam that would represent a significant visual element in the landscape.	The TSFs and stockpiles will be the most noticeable features from the proposal but will be consistent with the current industrial landscape. The proposed processing infrastructure will be either upgraded or extended to existing facilities and is expected to blend in with existing facilities.	The current plan does not provide a detailed assessment of the potential visual impact from the proposal particularly from any vantage points.	During construction and ongoing	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs)	<u>Clause 28</u> More information is required, but impacts are largely understood and consistent with the current environment. = STANDARD
							<u>Non-clause 28</u> More information is required, but impacts are largely understood and consistent with the current environment. = STANDARD

No.	Issue/Impact	Description	RISK		SCALE		LEVEL OF ASSESSMENT
			Issue/Impact	Response	Duration	Extent	
18	Infrastructure requirements	The proposal will have an impact on the local and wider infrastructure requirements including the potential to increase water extraction, increase in capacity on the wastewater infrastructure and additional load and power system security risks on the electricity network.	The proposal will require increase water extraction, increase in capacity on the wastewater infrastructure, additional load on the electricity network.	The current plan does not provide a detailed assessment of the potential impact from additional electricity and wastewater load.	During construction and ongoing	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs)	<u>Clause 28</u> More information is required on the proposals ability to impact the capacity of the wastewater infrastructure and additional load on the electricity network. More information is required that the system security matters in consultation with the Technical Regulator. = STANDARD
			Due to the size as South Australia's biggest load, the expansion increases risks to power system security.	Protection settings and operational procedures for the electricity load will need to be carefully managed in consultation with the Technical Regulator.			<u>Non-clause 28</u> More information is required on the proposals ability to impact the capacity of the wastewater infrastructure and additional load on the electricity network. More information is required that the proponent is considering power system security matters in consultation with the Technical Regulator. = STANDARD
19	Alternatives	There are potential alternatives to elements of the proposal, including water sources and electricity infrastructure that require exploring.	The proposed expansion and continuing BAU includes elements where alternatives should be explored.	The current plan does not provide a detailed assessment of potential alternatives.	Ongoing	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs)	<u>Clause 28</u> More information on alternatives and rationale as to the assessment of these is required. = STANDARD
							<u>Non-clause 28</u> More information on alternatives and rationale as to the assessment of these is required. = STANDARD
20	Effects from noise and vibration	The proposal has the potential to generate noise that may impact on nearby sensitive receptors and the environment.	Incremental expansion of existing facilities and equipment and construction and operation of new plants and facilities has the potential to result in increased noise levels at the Olympic Dam Village and Roxby Downs Township.	The current plan does not provide a detailed assessment of the expected impact from noise and vibration for the proposal of the Olympic Dam operation and the Olympic Dam airport.	During construction and ongoing	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs)	<u>Clause 28</u> Further information is required on the impacts of noise from operation and construction within the SML on offsite sensitive receptors including Olympic Dam Village. = STANDARD

No.	Issue/Impact	Description	RISK		SCALE		LEVEL OF ASSESSMENT
			Issue/Impact	Response	Duration	Extent	
							<p><u>Non-clause 28</u> Further information is required on the impacts of noise from the proposal on Roxby Downs. Further information is required on aircraft noise due to development occurring on the airport site. = STANDARD</p>
21	Construction effects	The construction of the proposal would require a range of impacts to be minimised, mitigated and monitored through an updated environmental management plan framework.	A range of standard and specific impacts would need to be adequately addressed (including consultation with stakeholders and the adoption of a risk analysis approach and relevant industry standards).	The current plan provides limited information about the proposed construction management techniques and potential timing.	During construction	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs)	<p><u>Clause 28</u> More information is required on construction impacts for construction on the SML and infrastructure corridors. Preliminary assessment is that impacts would be manageable. = STANDARD</p>
							<p><u>Non-clause 28</u> More information is required on construction impacts from the proposal on Roxby Downs. Preliminary assessment is that impacts would be manageable. = STANDARD</p>
22	Operational effects	The operation of the proposal, through the Indenture, is subject to an Environment Protection Management Program that aims to minimise, mitigate and monitor impacts from the Olympic Dam mine and processing facility.	A range of standard and specific impacts are and would continue to need to be adequately addressed (including consultation with stakeholders and the adoption of a risk analysis approach and relevant industry standards).	The current plan provides limited information on the operational management techniques and how the EPMP might be updated due to the proposal.	Ongoing	Local (on the SML and infrastructure corridors) and Regional (within Roxby Downs)	<p><u>Clause 28</u> More information is required on operational impacts from the SML and infrastructure corridors. Preliminary assessment is that impacts would be manageable. = STANDARD</p>
							<p><u>Non-clause 28</u> More information is required on operational impacts from the proposal within Roxby Downs. Preliminary assessment is that impacts would be manageable. = STANDARD</p>

			RISK		SCALE		LEVEL OF ASSESSMENT
No.	Issue/Impact	Description	Issue/Impact	Response	Duration	Extent	
23	Planning and environmental legislation and policies	A range of planning, environmental, mining and radiation related statutory requirements would need to be met for the construction and operation of the proposal.	The proposal will need to comply with relevant State and Australian government legal requirements, policy directions and strategic objectives.	The current plan does not provide a detailed description of all relevant requirements.	During construction and ongoing	Local, Regional, State and National	<u>Clause 28</u> Issue is well understood, but information that is more specific is required. = STANDARD
							<u>Non-clause 28</u> Issue is well understood, but information that is more specific is required. = STANDARD

CRITICAL ASSESSMENT

Commonwealth assessment requirements

Environment Protection and Biodiversity Conservation Act 1999 - Matters of National Environmental Significance

A delegate for the Australian Minister for the Environment has determined that the proposed action (EPBC 2019/8570) is likely to, or may have, a significant impact on the following Matters of National Environmental Significance (MNES) that are protected under Part 3 of the EPBC Act:

- Listed threatened species and communities (section 18 & section 18A);
- Listed migratory species (section 20 & section 20A); and
- The environment because the proposal is a nuclear action (section 21 & section 22A).

The proposal is to be assessed through an Accredited Assessment Process pursuant to section 87(1) of the EPBC Act. This process will accredit the South Australia Major Development assessment process for the purposes of assessing this proposal. These guidelines have been prepared with Australian Government input and their requirements are reflected through the assessment requirements specified in the section below.

This will provide the Australian Minister for the Environment, or their delegate, with sufficient information to make an informed decision whether or not to approve the proposed action under Part 9 of the EPBC Act, and if so, what conditions to attach.

CRITICAL ASSESSMENT

State and Commonwealth assessment requirements

Economic effects

Assessment requirement 1: The proposal will have an impact on the State's economy during construction, operation and closure/rehabilitation.

- 1.1 Provide a full economic analysis that details the assumptions used in the assessment and including different scenarios for the timing under which production might ramp up to different levels. Provide details of the assumptions used in the assessment and level of uncertainty with each scenario.
- 1.2 Detail the ongoing support to, and role of, Roxby Downs for continuing BAU and the expanded operations and in the future during closure/rehabilitation.
- 1.3 Describe the different scenarios for the timing under which production might increase including a sensitivity analysis and discussion of what factors might affect the staging of the proposal.
- 1.4 Describe potential employment opportunities and the expected impacts on communities. Identify the economic effect the construction and on-going workforce will have locally and State-wide. Identify workforce skills and training requirements.
- 1.5 Identify any secondary economic effects and commercial ventures in areas benefiting from OD-RDS and continuing BAU. Describe positive and negative effects of this, including current generation assets, and consideration of South Australian research partnerships and supply chain development opportunities and the possible location of these.
- 1.6 Identify any economic implications for the State and the region if the proposal does not proceed.
- 1.7 Describe the potential effect on property values for residential, commercial and industrial, particularly within Roxby Downs and Andamooka, and for South Australia in general.
- 1.8 Describe the impact on existing pastoral land uses.
- 1.9 Outline the financial strategies to be employed to ensure the relevant infrastructure is in place for each stage of the proposal.

Water management effects

Assessment requirement 2: The OD-RDS and continuing BAU proposes an increase in processing water, along with water for the township. In addition, groundwater is intercepted and impacted during mining operations. Continued and increased groundwater extraction from the Great Artesian Basin (GAB) may result in immediate and long-term impacts on the environment and other GAB uses.

- 2.1 Two water balances are required. One which describes the Olympic Dam mine and mineral processing operations, Olympic Dam Village, Roxby Downs, and other critical human users and impacted shallow aquifers and the Andamooka Limestone in this area. The second water balance will describe the areas of groundwater extraction, existing pastoralists, co-produced water from hydrocarbon production, and affected groundwater dependant ecosystems (GDEs) including Great Artesian Basin (GAB) springs for the GAB and all other water sources.
- 2.2 Describe the operational and management framework for the extraction of water from Wellfield A and B, delivery to the mine site, reuse and end use including clarifying the points of abstraction and whether it is within the existing designated area or a proposed new designated area.
- 2.3 Provide an assessment and groundwater model that demonstrates the impact on the GAB including other uses and include co-produced water. The assessment and groundwater model should incorporate the most up to date science being developed by South Australian Government agencies and where not available the data and information as identified in the Hydrogeological Atlas of the GAB and 2013 GAB Water Resource Assessment, including recent data provided by the Department for Environment and Water in 2019, the Water Allocation Plan for the Far North Prescribed Wells Area (current and draft) and Great Artesian Basin Strategic Management Plan. The base case scenario to be modelled is to include 60 ML per day based on the amount allocated for co-produced water and include two

timeframes – up to the expiration of both special water licences upon 8 May 2036 and mine development plans up to 2046. The model will identify the following:

- the impact of the proposed extraction of the additional water on the GAB.
 - The description is to be placed into the context of the existing monitoring information, which is to be presented as groundwater contour maps (in metres depth below ground level (mbgl) and AHD), hydrographs, concentration plots and in tabulated form.
 - The impact of the extraction on each aquifer should be described in terms of water pressure (in mbgl and AHD), water quality, particularly salinity and ecological impact at both the local (within the designated area) and regional level.
 - Groundwater contour maps of source aquifers (in mbgl and AHD) should also be provided overlain with GDEs including EPBC-listed springs and for pastoral bores.
 - the impact of the proposed extraction of the additional water on the shallow aquifers above the GAB. The impact of that extraction should be described in terms of water pressure, water quality and ecological impact at both the local (within the designated area) and regional level.
 - the potential move of extraction to more northerly areas of wellfield B or north of the current wellfield B means that there is a need to identify the risk to unrecorded GDEs. A GAB spring/GDE/threatened community and species audit in Kati-Thanda-Lake Eyre National Park, including Kati-Thanda-Lake Eyre will be required to enable a proper assessment of the impacts and effects of the proposed extraction. Presentation of information should be the same as identified in the first dot point.
 - the impacts of the proposed extraction of the additional water on the GDEs, including GAB Springs and threatened communities and species and other users including, existing pastoralists and petroleum producers, and identify measures to ameliorate all of those impacts.
- 2.4** Describe the proposed monitoring network and monitoring program, including pressure, water quality and ecological triggers to monitor the impacts of the proposed extraction of the additional water on GDEs, including GAB Springs and threatened communities and species and other users including existing pastoralists and petroleum producers. The monitoring program should present a statistically valid argument to justify any trigger values developed to monitor impacts, and should also clearly define the course(s) of action to be undertaken in the event that a trigger value is exceeded.
- 2.5** Provide a peer reviewed model history matching and verification reports, the terms of reference for the peer review and the reviewers' comments for the groundwater model.
- 2.6** In the circumstance where it is identified that expansion to existing Wellfield B or where a new wellfield may be likely, outline adherence to the requirements in clause 13 of the Olympic Dam and Stuart Shelf Indenture in the Schedule to the *Roxby Downs (Indenture Ratification) Act 1982*.
- 2.7** Undertake a comparative analysis of alternative water sources and the social, environmental and economic advantages and disadvantages of each.
- 2.8** Identify triggers for pressure reductions to establish a proactive response to maintain pastoral water supplies.

Radiation effects

Assessment requirement 3: The proposal involves the mining and processing of ore containing elevated levels of uranium and other naturally occurring radioactive material that may result in radiation exposures to workers, the public and the environment at levels above natural background. Radioactive plant may need to go off the SML and to the local heavy industry area for maintenance or repair.

Radiation should be described in accordance with the Code of Practice for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (2005) published by the Australian Radiation Protection and Nuclear Safety Agency, and the codes, standards and recommendations referenced in clause 10 of the Olympic Dam and Stuart Shelf Indenture in the Schedule to the *Roxby Downs (Indenture Ratification) Act 1982*.

- 3.1 Provide a radionuclide balance for the SML site.
- 3.2 Quantify the volume and radiological characteristics (including radionuclide activity concentrations) of the solid and liquid radioactive waste from all relevant components of the proposal.
- 3.3 Describe the method of storage of the solid and liquid radioactive waste from all relevant components of the proposal during ongoing operations.
- 3.4 Describe the method of disposal of the solid and liquid radioactive waste from all relevant components of the proposal after operations are completed.
- 3.5 Describe the measures to control and minimise releases and subsequent exposure of radionuclides to the environment, members of the public and non-human biota from all relevant components of the proposal during ongoing operations and after rehabilitation of the site.
- 3.6 Describe the measures to control and minimise radiation exposures to workers from all relevant components of the proposal during ongoing operations.
- 3.7 Describe and assess the radiation exposure pathways to workers, the public and non-human biota from the all relevant components of the proposal during ongoing operations and after rehabilitation of the site.
- 3.8 Outline how the radiation exposure pathways to workers, the public and the environment from all relevant components of the proposal would be monitored during construction, operation and closure/rehabilitation of the site.

Air quality effects

Assessment requirement 4: The proposal has the potential to increase air pollution emissions through an increased scale of production and/or change in ore grade that may result in immediate and long-term effects on humans and the environment.

- 4.1 Provide a health and amenity impact assessment to identify any known or potential human health and amenity effects of air emissions (including point source and diffuse sources) on the residential population and local businesses and describe how these would be mitigated, minimised, managed and monitored.
- 4.2 Describe the existing air environment, which may be affected by the proposal. A description of the existing air quality conditions should be provided having regard for particulates, gaseous and odorous compounds. The background levels and sources of suspended particulates, PM₁₀, PM_{2.5}, SO_x, NO_x, HF, and any other major constituent of the air environment that may be affected by the proposal should be discussed.
- 4.3 Provide a baseline for later studies or for the modelling of air quality environmental impacts that includes sufficient data on local meteorology and ambient levels of pollutants, if any, within the proposal's air shed. Parameters are to include air temperature, humidity, wind speed and direction, atmospheric stability, mixing height/depth and other parameters necessary for input to predictive models.

- 4.4 The potential for interaction between the emissions from the processing plant and mine (including emissions from blasting operations) and existing particulates in the air shed, and the likely health and environmental impacts, if any, from any such interaction should be considered. The assessment should consider the impacts of dust deposition on adjacent areas.
- 4.5 Describe the practical measures for protecting environmental values for air and how the relevant standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed. The origins, quantities and composition of airborne emissions from the proposal during construction and operation should be addressed.
- 4.6 Compare the proposed levels of emissions with Schedule 4 of the Environment Protection (Air Quality) Policy 2016. Emission levels should also be discussed in relation to those that trigger reporting thresholds under the National Pollutant Inventory (NPI) for those industries relevant to the proposal, if any.
- 4.7 The maximum ground level concentrations for major air borne pollutants should be predicted using appropriate computer modelling, where appropriate. These predictions should be made for expected maximum emission conditions and worse-case meteorological conditions, and compared with maximum ground level concentrations in Schedule 2 of the Environment Protection (Air Quality) Policy 2016 at the nearest sensitive receivers (including the Olympic Dam Village and Roxby Downs). The techniques used to obtain the predictions should be referenced and key assumptions and data sets explained. It is preferable that the meteorological year of 2009 be used in air dispersion modelling for consistency with the existing operations. The pollutants to be modelled must include any significant mass emissions, including volatile organic compounds associated with the processing plant.
- 4.8 Outline how potential air pollution from the proposal would be monitored during ongoing operations.

Impacts on cultural heritage

Assessment requirement 5: The proposal has the potential to impact on sites/locations of Aboriginal or non-Aboriginal heritage through disturbance during construction. Additionally there are Native Title implications associated with Crown land.

- 5.1 Identify any effects on Aboriginal sites, objects and remains (including but not limited to those listed in the Commonwealth and National Heritage List and the SA Register of Aboriginal Sites and Objects). Indicate any consultation with local Aboriginal organisations that have an interest in the area, including engagement of Aboriginal people in cultural heritage surveys.
- 5.2 Identify any effects on post European settlement sites of heritage significance.
- 5.3 Identify the potential effects and measures to avoid and/or mitigate the proposal on the local, regional, state or national conservation status of sites, objects and areas of significance to Aboriginal people during construction, operations and closure/rehabilitation.
- 5.4 Outline measures adopted to avoid impacts on Aboriginal sites, objects and remains, as well as European sites of archaeological or anthropological significance that have been identified by the consultation undertaken as per assessment requirement 5.1 and any plans to deal with the discovery of Aboriginal heritage during work activities. If avoidance has not been possible in the proposal design, detail the steps to ensure that any unavoidable damage, disturbance and interference is minimised and done in compliance with the *Aboriginal Heritage Act 1988* or the *Aboriginal Heritage Act 1979* (as applicable).
- 5.5 Identify any Native Title issues in respect of the requirements of the *Native Title Act 1993*.
- 5.6 Describe the impact on the appropriate Native Title Claimants and the consequent impact on the potential ongoing enjoyment of native title rights (if any) by native titleholders.
- 5.7 Describe how Aboriginal heritage protection is being dealt with in the context of any measures taken to comply with the *Native Title Act 1993*.

Effects on flora and fauna

Assessment requirement 6: The proposal traverses significant stands of native vegetation and fauna including possibly threatened species and ecological communities.

- 6.1 Identify the potential effects and measures to avoid and or mitigate the proposal on the local, regional, state or national conservation status of individual species and vegetation communities during both construction, operations and closure/rehabilitation (including species listed in the *SA National Parks and Wildlife Act 1972* and the *Commonwealth Environment Protection Biodiversity Conservation Act 1999*).
- 6.2 Describe the location, extent, condition and significance of native flora and fauna species and communities that may need to be cleared or disturbed during both construction and ongoing.
- 6.3 Describe the ability of communities or individual species to recover, regenerate or be rehabilitated during construction, operations and closure/rehabilitation.
- 6.4 Identify the habitat value of native flora and the potential for habitat fragmentation during construction, operations and closure/rehabilitation.
- 6.5 Outline measures to mitigate effects on native flora and fauna by addressing the mitigation hierarchy referenced in the *Native Vegetation Regulations 2017*, including any compensatory activities in already degraded areas and use of existing easements. Make reference to guidelines produced by the *Native Vegetation Council* and outline the effectiveness of any mitigation measures adopted during both construction and maintenance.
- 6.6 Identify the potential impact of fire on native vegetation, and the effects of fire risk management processes during both construction and maintenance.
- 6.7 Describe strategies to manage and monitor invasive weed species and pest animals to protect terrestrial species.
- 6.8 Describe how the proposal is consistent with any relevant EPBC Act guidelines, conservation advice and/or recovery plans.
- 6.9 Describe the measures taken to manage displaced native fauna (if any).
- 6.10 Detail appropriate buffer distances that will be required between the proposals components and threatened, endangered and protected species, including feeding areas, nesting sites and roosting sites.
- 6.11 Describe measures to minimise, manage, monitor and rehabilitate impacts on the terrestrial environment within and around the development, including managing the spread of pest plants and animals.
- 6.12 Describe the risk across the inventory of ecological assets and identification/management of sensitive receptors of causing or exacerbating any environmental problems in the locality, and describe mitigation measures and their expected effectiveness during all stages of construction and post construction.
- 6.13 Describe all of the monitoring measures, reporting regimes and audits for native flora and fauna and introduced species.

Impacts on sustainability and climate change

Assessment requirement 7: The proposal has the potential to have a significant impact on sustainability and greenhouse gas emissions during continuing BAU and during the expansion.

- 7.1 Describe the sustainability objectives of the proposal and the approach and methodology used to achieve these objectives.
- 7.2 Describe design guidelines for all aspects of the proposal (including transport options) that would be adopted to ensure sustainability.
- 7.3 Describe the means by which the sustainability of the proposal will be audited.

- 7.4 Provide a process flow diagram for all production processes to be used, showing major uses of energy and opportunities for efficiency gains.
- 7.5 Identify ways in which power use can be minimised or supplemented, especially using alternative energy sources, energy efficient measures and energy conservation. Including measures to minimise, reduce and ameliorate greenhouse gas emissions and identify barriers to implementation.
- 7.6 Identify all sources and levels of greenhouse gas emissions that would be generated and climate change implications, including those from transport and the operation of the plant and infrastructure.
- 7.7 Detail the quantity of fossil fuels likely to be burnt and estimate the tonnage of CO₂ emitted to the atmosphere by the proposal (both annually and for the life of the facility).
- 7.8 Identify the impact and effects of projected climate change to 2070 using the median prediction of emissions scenario RCP 8.5, particularly increased heat and rainfall intensity on surface water management and water demand for the Olympic Dam mine and processing, Roxby Downs, Andamooka and other critical human uses, existing pastoralists and GDE's including GAB springs and threatened communities and species.
- 7.9 Assessment Requirement 2.1 above requires two water balances, one for the local ground and surface water and one for GAB extraction. Both water balances should take into account the effects of projected climate change to 2070 using the median prediction of emissions scenario RCP 8.5.
- 7.10 Taking account of projected climate change to 2070 using emissions scenario RCP 8.5, identify alternative options and measures to
- manage stormwater;
 - assure security of supply for all existing users; and
 - protect shallow groundwater GDE's including springs and threatened species and communities.
- 7.11 Examine the potential cumulative effects of climate change from a risk management perspective, including adaptive management strategies, as an effect in addition to the impacts from the development and its operations.

Waste management

Assessment requirement 8: The proposal requires the use, establishment or expansion of waste management facilities for a variety of wastes.

- 8.1 Describe how all types of waste streams (including rock waste, tailings, commercial and industrial waste, construction and demolition waste, hazardous waste, radioactive waste and any municipal solid waste) generated during both the construction and operational phases would be managed in accordance with the waste management hierarchy as referenced in section 4(b) of the *Environment Protection Act 1993*.
- 8.2 Describe sources and expected total volumes of each waste produced, including an inventory of the following per unit volume of product produced:
- The tonnage of products processed;
 - The amount of resulting process wastes;
 - The volume and tonnage of any by-products;
 - The volume and tonnage of decommissioning waste; and
 - The physical and chemical characteristics of solid and the liquid waste.
- 8.3 Describe the location (including temporary and final locations), design, construction and operation of proposed waste management storage, stockpiling, treatment (including the separation of waste streams, such as recyclables, hard waste, hazardous waste and radioactive waste) and disposal facilities and areas and provide details of how these facilities will be serviced and managed to avoid causing any unacceptable environmental harm. Include reference to which type of wastes (including hazardous and radioactive wastes) will be located in which facilities. Include details of design and management measures that will be used to minimise the risk of leakages/spills and prevent site contamination.

- 8.4 Describe contingency and monitoring measures in the event of incidents or equipment or operational failures (including loss of containment) from proposed waste storage or disposal facilities.
- 8.5 Describe the proposed environmental and geotechnical monitoring programs that will be used to monitor the impacts from the construction and operation of the proposed waste facility, including the transfer of waste products to this facility.
- 8.6 Due to the possibility of no available licenced waste management pathway, identify contingency measures for dealing with or disposing of all types of hazardous or listed wastes generated in the course of operations (including but not limited to wastes containing asbestos, cyanides, hydrocarbons and organic compounds, per- and poly-fluoroalkyl substances and vanadium compounds).
- 8.7 Provide details of a radioactive waste management plan that describes how radioactive waste management will meet the requirements of the Code of Practice for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (2005) published by the Australian Radiation Protection and Nuclear Safety Agency and the codes, standards and recommendations referenced in clause 10 of the Olympic Dam and Stuart Shelf Indenture in the Schedule to the *Roxby Downs (Indenture Ratification) Act 1982*.

Effects on communities

Assessment requirement 9: The proposal has the potential to affect the local community during construction and through the various stages of OD–RDS and continuing BAU construction, operations and closure/rehabilitation.

- 9.1 Outline the likely size and composition of the construction and operational workforce and other employees, how accommodation requirements will be met and detail employment opportunities for the local community, including the multiplier effect.
- 9.2 With reference to Assessment Requirement 1.4, describe the expected effects of the additional workforce on community infrastructure and services (including recreation, health, education, childcare and other local human services) and how these are proposed to be managed.
- 9.3 Detail the ongoing support to, and role of, Roxby Downs for the proposed operations.
- 9.4 Describe the impact of the increase in workforce (including FIFO, DIDO and residences) during construction, operations and closure/rehabilitation on the nearby towns and the region as a whole. In particular the impact on local business and effects on accommodation supply and demand.
- 9.5 Describe the potential positive and negative social impacts that could result from an increased population and how this is proposed to be managed.
- 9.6 Outline the impact of the proposal on existing land uses (including conservation and pastoral land). Include potential impacts on fences, water supply and stock watering points.
- 9.7 Describe the proximity of the proposal to townships and dwellings, and describe any potential impacts of the proposal on quality of lifestyle.
- 9.8 Outline potential impacts on any other use of the land by Aboriginal people, or on cultural values held by Aboriginal people that relate to the areas affected by the proposal.
- 9.9 Describe any community consultation and stakeholder engagement processes conducted or planned in the future by the proponent and indicate current community and stakeholder attitudes towards the proposal, where identified.
- 9.10 Address any potential effects of the proposal on public health.
- 9.11 Identify any potential effects on airfields and aircraft movements, and consult with the Civil Aviation Safety Authority Australia, about the requirements for upgrade of airports.
- 9.12 Detail opportunities for local vocational training and employment.
- 9.13 Describe the impacts on the tourism and recreation values due to increased human activity and disturbance.

MEDIUM ASSESSMENT

Traffic and transport effects

Assessment requirement 10: The proposal requires access for the transportation of large modules and construction material to site and ongoing transportation of materials to and product from the site.

- 10.1** Describe the methodology of the transport assessment.
- 10.2** Describe the existing transport networks and services (all modes) servicing existing operations, and assess the performance (efficiency and safety) of the existing transport system.
- 10.3** Describe the proposed transport networks and services (all modes) to be used along the entire supply chain (input and output), for construction/implementation and operational phases.
- 10.4** Determine the expected increase in the movement of people and materials/products (input and output) along the entire supply chain (i.e. mine to port), including detailing the types of vehicles to be used (e.g. High Productivity Vehicles).
- 10.5** Identify and assess the risks associated with the expected increase in movements, and determine appropriate mitigation measures.
- 10.6** Assess any impacts upon the community, and determine appropriate mitigation measures.
- 10.7** Identify any design modifications to minimise the impact upon the transport system.
- 10.8** Determine the transport system asset improvements, asset management/maintenance requirements, and operational management requirements to accommodate the increase in movements and/or vehicle sizes/mass for affected transport assets and services across all modes for the proposals construction/implementation and operational phases. This would include (but not limited to):
 - Any implications for the local and arterial road system along the entire supply chain.
 - Any air transport or public transport requirements.
 - Any structural improvement requirements (e.g. bridge/culvert improvements).
 - Any requirements that are outside of the current gazetted heavy vehicle networks, and any measures required to ensure compliance with the 'Heavy Vehicle National Law'.
 - Whether modifications are temporary or permanent.
 - Any operational management measures to minimise delays and ensure safety for other transport users (e.g. temporary road closures/detours), including transport of plant and equipment to/from the site.
 - Any management measures for transport of hazardous materials.
 - Any increase (temporary or ongoing) in maintenance requirements of transport assets.
- 10.9** Identify staging/timing of transport system interventions.
- 10.10** Detail estimated changes to movements of radioactive substances, including uranium oxide concentrate (UOC), and any changes required to UOC transport management plans.

Hazard risk

Assessment requirement 11: The construction, operations and closure/rehabilitation of OD–RDS and continuing BAU has the potential to involve a range of general and specific risks, including a risk to public safety.

- 11.1 Describe all aspects of the proposal in the context of a risk assessment framework. The risk assessment should document the assumptions, methodologies, data sources and results used in the risk assessment including describing unmitigated risk, risk controls and any residual risk. When assessing risk using the Australian Standard AS/NZS 3100 Risk Management, high production/material handling rates should be assumed, as well as failure scenarios. Monitoring should be informed by the risk assessment.
- 11.2 The risk assessment should include information on mitigating controls including management and response to minimise the impacts from any triggered risk.
- 11.3 Describe plant operations, start-up and shutdown issues, and the transport, unloading, storage, handling and use of hazardous materials.
- 11.4 Describe any hazardous materials, with reference to storage (including any associated fire protection facilities), use, handling and disposal of these materials during construction and operation.
- 11.5 Describe procedures and strategies to prevent, manage and mitigate pollution spills or leaks, including during periods of extreme rainfall.
- 11.6 Evaluate the potential effects of any accidents involving dangerous substances on the environment and public health in the vicinity of the site.
- 11.7 Evaluate the risk of fire, explosion, containment facility failure or other high consequence events at the site and any potential impacts on human health and to the environment. This should include a description of the critical controls (and how they will be maintained) that will be used to minimise the risks and mitigate the impacts from these catastrophic risks.
- 11.8 Identify any safety risks associated with construction and operation including strategies for ensuring public safety.
- 11.9 Describe the likelihood of birds entering the tailings storage facility and evaporation ponds and the management of such a hazard.
- 11.10 Describe any risks associated with waste facility stability, potential for acid mine drainage generation and implication post rehabilitation/closure.
- 11.11 Address the implications of seismicity in the area in relation to both the construction and operation.
- 11.12 Detail the designation of risk zones, their management and implications for on-site planning and land use.
- 11.13 Describe how security of the site would be ensured (especially for hazardous materials).

Effects on local groundwater

Assessment requirement 12: The proposal, being an underground mine, has the potential to impact on groundwater at the mine site.

- 12.1 Describe the known groundwater related environmental conditions, including the current groundwater quality, any existing site contamination, and any identified potential sources of groundwater pollution. Describe the potential changes to hydrology (including water quality), as a result of the proposal, and the implications of these changes.
- 12.2 Describe the location of groundwater infrastructure and the potential for groundwater interception and how dewatering might be managed.
- 12.3 The potential for impacts to groundwater quality as a result of the use of an alternative paste backfill material (using tailings-based fill material) for underground mine voids needs careful consideration with clear evidence to justify any conclusions.

- 12.4 Water quality impacts should consider metals, non-metallic inorganics (including major anion and cation chemistry), and any other parameters considered important for existing groundwater users/uses in the vicinity of the projected area of impact.
- 12.5 Identify the proposed monitoring network and monitoring program for groundwater resources with particular reference to water quality and ecological triggers to monitor the impacts on the aquifers, GDEs, threatened communities and species and other users and identify measures to ameliorate all these impacts. The monitoring program should present a statistically valid argument to justify any trigger values developed to monitor impacts, and should also clearly define the course(s) of action to be undertaken in the event that a trigger value is exceeded.

Decommissioning, transitional and rehabilitation arrangements

Assessment requirement 13: The proposal involves the decommissioning and establishment of new plant and equipment during the mine's operation phase. Decommissioning and transition will need to be well planned to ensure risks, such as outages, are minimised.

- 13.1 Outline likely decommissioning and rehabilitation plans for the proposal, including timing.
- 13.2 Outline the transitional arrangements from decommissioning the old plant and commissioning the upgraded and expanded plant including contingency plans.
- 13.3 Outline the management and scheduling measures that will be undertaken during site preparation and decommissioning/demolition activities, including the removal of contaminated materials and the assessment and management of this material and any remaining contamination.
- 13.4 Outline the site contamination investigations and any necessary soil/groundwater remediation work to be undertaken in association with proposal, including the proposed plant or equipment decommissioning/removal work.

Closure management and rehabilitation arrangements

Assessment requirement 14: The Olympic Dam operation requires the closure and rehabilitation at end of mine life, to negate long-term environmental impacts and liabilities. The use of 'design for closure', progressive rehabilitation and ongoing rehabilitation investigations and studies throughout the life of the proposal as key principles.

- 14.1 Detail the closure management and rehabilitation required for the proposal, including closure objectives and outcomes.
- 14.2 Detail how 'design for closure' principles will be adopted for all mining, mineral processing infrastructure and associated waste management facilities to ensure the meeting of closure objectives and outcomes.
Note 'Design for closure' is relevant at all stages of an operations life from the early design phases, choices of locations for permanent structures (i.e. waste facilities), construction, operation to formal closure and rehabilitation.
- 14.3 Detail the closure strategies including demonstrating the long-term chemical and physical stability of all waste facilities (including but not limited to: tailings storage facilities, evaporation ponds, waste rock facility).
- 14.4 Detail the fate of key supporting infrastructure (including but not limited to: Olympic Dam Village, Roxby Downs, airport, electricity network and GAB pipeline).
- 14.5 Detail progressive closure and rehabilitation opportunities throughout the operations life.
- 14.6 Detail closure and rehabilitation uncertainties and future works to address such uncertainties throughout the operations life.
- 14.7 Discuss the post-closure land use and detail how long term liabilities will be managed.

STANDARD ASSESSMENT

Effects on the physical environment and land use

Assessment requirement 15: The proposal has the potential to disturb landforms and may result in immediate and long-term effects on land use.

- 15.1 Describe the nature and condition of the existing physical environment in the proposal's environs, including reference to geology, geomorphology, soils, hydrology and atmosphere.
- 15.2 Identify any risks and implications of causing or exacerbating land degradation, especially soil erosion.
- 15.3 Outline mitigation measures and their likely effectiveness in minimising or avoiding disturbance to the physical environment (including surface and underground waters) during construction, operations and closure/rehabilitation.
- 15.4 Identify the types and extent of land tenure in broad terms, including reference to Crown Land. Outline any implications for Native Title, including infrastructure corridors.
- 15.5 Describe the land tenure arrangements during and after construction.
- 15.6 Identify the main land uses in the area (e.g. conservation, mining, agriculture, pastoralism, tourism, recreation, and existing infrastructure).
- 15.7 Identify the level of interface with landowners, land uses and activities in the immediate and surrounding environs.
- 15.8 Describe the implications of securing any easements (if any) in particular, for the GAB water extraction.

Effects on surface water

Assessment requirement 16: The proposal has the potential to increase impervious surface areas and increase concentration of metals and other potential contaminants in stormwater run-off.

- 16.1 Identify the impact and effects of the mine and processing continuing BAU and expansions (including groundwater exploration works and construction of infrastructure at new wellfields) on surface water and stormwater management, including consideration of any existing site contamination and identify any measures to ameliorate those impacts.
- 16.2 Identify the potential for pollution (including, but not limited to, sedimentation) of wetlands, watercourses, drainage channels, including the implications of this pollution. The potential for pollution as a result of loss of containment of waste and/or by-products (e.g. TSFs, EPs) needs to be considered noting that the *Environment Protection Act 1993* requires that all reasonable and practicable measures will be undertaken to prevent any pollution to groundwater, regardless of the existing groundwater quality.
- 16.3 Describe the impacts and proposed management of stormwater during construction and operation, including any opportunities for retention and reuse of water within processes and on site. Provide details of a soil erosion and drainage management report and monitoring and maintenance requirements to ensure all erosion and drainage management measures are functioning accordingly.
- 16.4 Identify the proposed monitoring network and monitoring program for surface water resources with particular reference to water quality and ecological triggers to monitor the impacts on the aquifers, GDEs, threatened communities and species and other users. The monitoring program should present a statistically valid argument to justify any trigger values developed to monitor impacts, and should also clearly define the course(s) of action to be undertaken in the event that a trigger value is exceeded.

Visual impacts

Assessment requirement 17: The proposal will be a significant increase in mining and processing operations at Olympic Dam that would represent a significant visual element in the landscape.

- 17.1** Describe the effects of the proposal on the visual amenity and landscape quality for residents and visitors. Refer to construction, operations and closure/rehabilitation aspects of the proposal, and outline the methodology adopted for classifying landscapes and assessing visual and landscape impacts.
- 17.2** Describe alternative measures for minimising potential loss of visual amenity (for example structural design and placement and screening) and detail any compensatory and site rehabilitation measures that will be undertaken to minimise visual impacts as a result of vegetation clearance.
- 17.3** Describe and illustrate the visual effect of the proposal on the locality when viewed from important viewing points.
- 17.4** Describe the use of amenity/landscape plantings and potential broad scale revegetation, including the opportunities for the use of locally endemic species.

Infrastructure requirements

Assessment requirement 18: The proposal will have an impact on the local and wider infrastructure requirements including the potential to increase water extraction, increase in capacity on the wastewater infrastructure and additional load on the electricity network.

- 18.1** Outline the requirements for an adequate supply and the location of distribution networks for gas, electricity, water, sewerage, stormwater management, communications system and roads.
- 18.2** Describe the impact the proposal will have on the existing infrastructure on the SML and in Roxby Downs, including the need for infrastructure upgrading, or alternative systems to which the proposal will connect. Include details of the location, design (including scale) where known of proposed upgraded or new infrastructure.
- 18.3** Describe the provision of an adequate power supply for the proposal and include information on the amount of power required.

Alternatives

Assessment requirement 19: There are potential alternatives for elements of the proposal, including water sources, electricity infrastructure, processing techniques, TSFs design, EPs designs and waste management techniques that require exploring.

- 19.1** Provide a brief comparative social, environmental and economic analysis of broader alternatives that could meet the proposed objectives at the State level and in the region, including alternative sources of water and power supply.
- 19.2** Identify alternative design and construction techniques to meet the proposed objectives, with reference to any hazards/risks and the social, environmental and economic advantages and disadvantages of each.
- 19.3** Assess the 'do nothing' option.

Effects from noise and vibration

Assessment requirement 20: The proposal has the potential to generate noise that may impact on nearby sensitive receptors and the environment.

- 20.1** Detail the predicted levels of environmental noise associated with operation of the proposal, identifying all potential noise sources (including the airport), and describe the impact upon the immediate and wider locality (including sensitive receivers). Identify if the predicted noise from ongoing operational sources associated with the operations will meet the noise goals in the Environment Protection (Noise) Policy 2007 (Noise Policy) at the nearest noise sensitive receivers when operating under worst-case meteorological conditions. The assessment should include all reasonable and practicable measures to minimise noise impacts on sensitive receivers if the noise goals in the Noise Policy are predicted to be exceeded. Details of how any such measures will be monitored, audited and managed should be included.
- 20.2** Describe current background noise and vibration levels at sensitive receivers and changes to these levels as a result of the proposal (during both the construction and operational phases). Sufficient data should be gathered to provide baseline information for comparison with any future monitoring undertaken during the construction and operational phases.
- 20.3** Include information about blasting which might cause ground vibration or fly rock on, or adjacent to, the SML. The magnitude, duration and frequency of any vibration generating activity should be discussed.
- 20.4** Details of any noise or vibration monitoring undertaken should also be incorporated. The location of noise and vibration sensitive receivers should be identified on an appropriately scaled plan. The potential environmental impact, if any, on terrestrial and marine animals and avifauna, particularly migratory species, should also be considered.
- 20.5** Information, including noise contours from a suitable acoustic model, should be provided for significant noise generating activities (for example blasting, desalination plant operation) when operating under worst-case meteorological conditions.

Construction effects

Assessment requirement 21: The construction of the proposal would require a range of impacts to be minimised, mitigated and monitored through an environmental management plan framework.

- 21.1** Describe construction techniques and the timing of construction, with reference to any climatic and temporal implications for the biophysical environment. This should include reference to potential land degradation, pollution and implications for the breeding seasons of native species.
- 21.2** Describe the likely impact and measures for the control of dust, vibration, noise, emissions, drag out (i.e. onto public roads) and litter during construction.
- 21.3** Describe sources of water for construction.
- 21.4** Outline all on site infrastructure required for construction (e.g. borrow pits, site compounds, concrete batching facilities etc.) including the management and decommissioning/rehabilitation of these areas.
- 21.5** Describe the location(s) where mobile plant would be used and the management of wastewater, dust emissions and noise from such plant.
- 21.6** Describe the rehabilitation of the areas needed for construction including lay down areas. Include reference to detailed site investigations to be undertaken to inform remediation strategies if site contamination exists or is suspected.

Operational effects

Assessment requirement 22: The operation of the proposal, through the Indenture, is subject to an Environment Protection Management Program that aims to minimise, mitigate and monitor impacts from the Olympic Dam mine and processing facility.

- 22.1** Outline the proposed environmental management measures that would be adopted to deal with the identified operational and maintenance effects. Include reference to measures that would be adopted such as:
- Any baseline studies, monitoring programmes, training programmes and reporting mechanisms (internally and to public authorities).
 - Outlines of the effectiveness of mitigation measures for perceived and recognised impacts, and
 - Include consideration of previously demonstrated best practice or approaches that may have been used for similar works in similar habitats, which may be of benefit and/or have been endorsed for their proven low impact effects. Equally, innovative or new approaches should also be included.
- 22.2** Identify the risks of contamination of surface and groundwater and soils from processing material and emissions. Describe measures for the prevention and containment of spills, describe the contingency plans to be implemented in the event of spills, and comment on their expected effectiveness.

Planning and environmental legislation and policies

Assessment requirement 23: A range of planning, environmental, mining and radiation related statutory requirements would need to be met for the construction and operation of the proposal.

- 23.1** Describe the proposal in terms of its consistency with the relevant Development Plans, Planning and Design Code, the Planning Strategy and the State Planning Policies.
- 23.2** Describe the proposal in terms of its consistency with relevant State and Commonwealth legislation.
- 23.3** Outline any other Commonwealth or State Government initiatives that may relate to the proposal, including greenhouse issues, principles of ecologically sustainable development, power generation, and the conservation or protection of the biological environment, Australian Radiation Protection and Nuclear Safety Agency. Describe the proposal in terms of its consistency with these initiatives.
- 23.4** Identify any potential implications of the proposal for International Conventions and Agreements to which the Commonwealth of Australia is a party.

APPENDIX 1: USEFUL DOCUMENTS

Legislation

- *Aboriginal Heritage Act 1979*
- *Aboriginal Heritage Act 1988*
- *Development Act 1993*
- *Development Regulations 2008*
- *Environment Protection Act 1993*
- *Harbors and Navigation Act 1993*
- *Heavy Vehicle National Law and regulations*
- *Landscape South Australia Act 29019*
- *Native Vegetation Act 1991*
- *Native Title (South Australia) Act 1994*
- *National Parks and Wildlife Act 1972*
- *Natural Resources Management Act 2004*
- *Radiation Protection and Control Act 1982*
- *Rail Safety National Law (South Australia) Act 2012 and Regulations*
- *River Murray Act 2003*
- *Roxby Downs (Indenture Ratification) Act 1982*
- *Work Health and Safety Act 2012 and Regulations*
- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999.*

Strategy and policy

- Development Plans and Planning and Design Code
 - Land not within a Council Area
 - Roxby Downs (Municipality) Development Plan
- Region Plans
 - Far North Region Plan
 - Mid North Region Plan
- State Planning Policies, 2019
- *Environment Protection (Noise) Policy 2007*
- *Environment Protection (Water Quality) Policy 2015*
- *Environment Protection (Air Quality) Policy 2016*
- South Australia's Waste Strategy 2015 – 2020, Office of Green Industries SA
- Building Code of Australia
- EPBC Act Recovery Plans for listed threatened species and ecological communities
- EPBC Act Conservation Advices for listed threatened species and ecological communities
- EPBC Act Environmental Offsets Policy

Guidelines

- Stormwater Pollution Prevention Code of Practice for the Building and Construction Industry, 1999
- Guide for applications to clear native vegetation, 2017
- EPA Construction environmental management plans guidelines, 2018
- EPA Guideline for the assessment and remediation of site contamination (as updated 2019)
- Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act, 2010
- Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act, 2011