PRELIMINARY ENVIRONMENTAL ASSESSMENT

YTC RESOURCES LIMITED

Hera Project, via Nymagee

Preliminary Environmental Assessment

July 2011

Prepared by:

R.W. CORKERY & CO. PTY. LIMITED

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Hera Project, via Nymagee

Preliminary Environmental Assessment

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1. INTRODUCTION

1.1 SCOPE

YTC Resources Limited ("the Proponent") proposes to construct and operate the Hera Project ("the Project") to extract gold and base metals from the Project Site (see Section 1.3) located approximately 4km south of the township of Nymagee (**Figure 1**). The Project will comprise construction and operation of an underground mine, Processing Plant, temporary Waste Rock Emplacement, Tailings Storage Facility, a Mine Camp, site access roads, as well as ancillary activities and associated infrastructure.

This *Preliminary Environmental Assessment* has been prepared by R.W. Corkery & Co. Pty. Limited in support of the Proponent's application for approval of the Project. The document introduces the Project and provides information on the key environmental issues to be addressed in the design and assessment of the Project. The information provided will ultimately be incorporated into a comprehensive *Environmental Assessment*, to be prepared in accordance with the requirements of Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This document has been prepared for circulation to Department of Planning and Infrastructure to allow the Department to determine whether formal consultation with other relevant government agencies in relation to the Project may commence.

1.2 THE PROPONENT

YTC Resources Limited is an Australian Securities Exchange (ASX) listed exploration and mining development company. The Company is based in Orange, in central New South Wales. The Company complies with the continuous disclosure requirements of the ASX and users of this document are referred to the Company's website (www.ytcresources.com) for the most up to date information released to the market.

In June 2009, the Company announced the acquisition of the Hera Project in Central NSW from CBH Resources Limited. In September 2009, the Company raised $25 million through a Placement and Share Purchase Plan. The proceeds of this capital raising exercise were used to fund the acquisition and advance the Hera Project through a Definitive Feasibility Study. It also funded an exploration programme designed to extend the Hera resource and to discover a new "Cobar Style" gold and base metals deposit.

1.3 PROJECT SITE

The Hera Project falls within the Cobar Local Government Area on "The Peak" property, approximately 4km south of the township of Nymagee. For the purposes of this document, the Project Site encompasses all areas of proposed Project-related disturbance, and covers an area of 1532ha. The Project Site is located wholly within "The Peak" property (Lot 664, DP 761702) (**Figure 2**). "The Peak" is held by the Proponent under Western Lands Lease No. WLL2455, granted under the *Western Lands Act 1901* and managed by the Land and Property Management Authority. It is noted that the Proponent may, subject to completion of negotiations with neighbouring landowners, extend the Project Site.

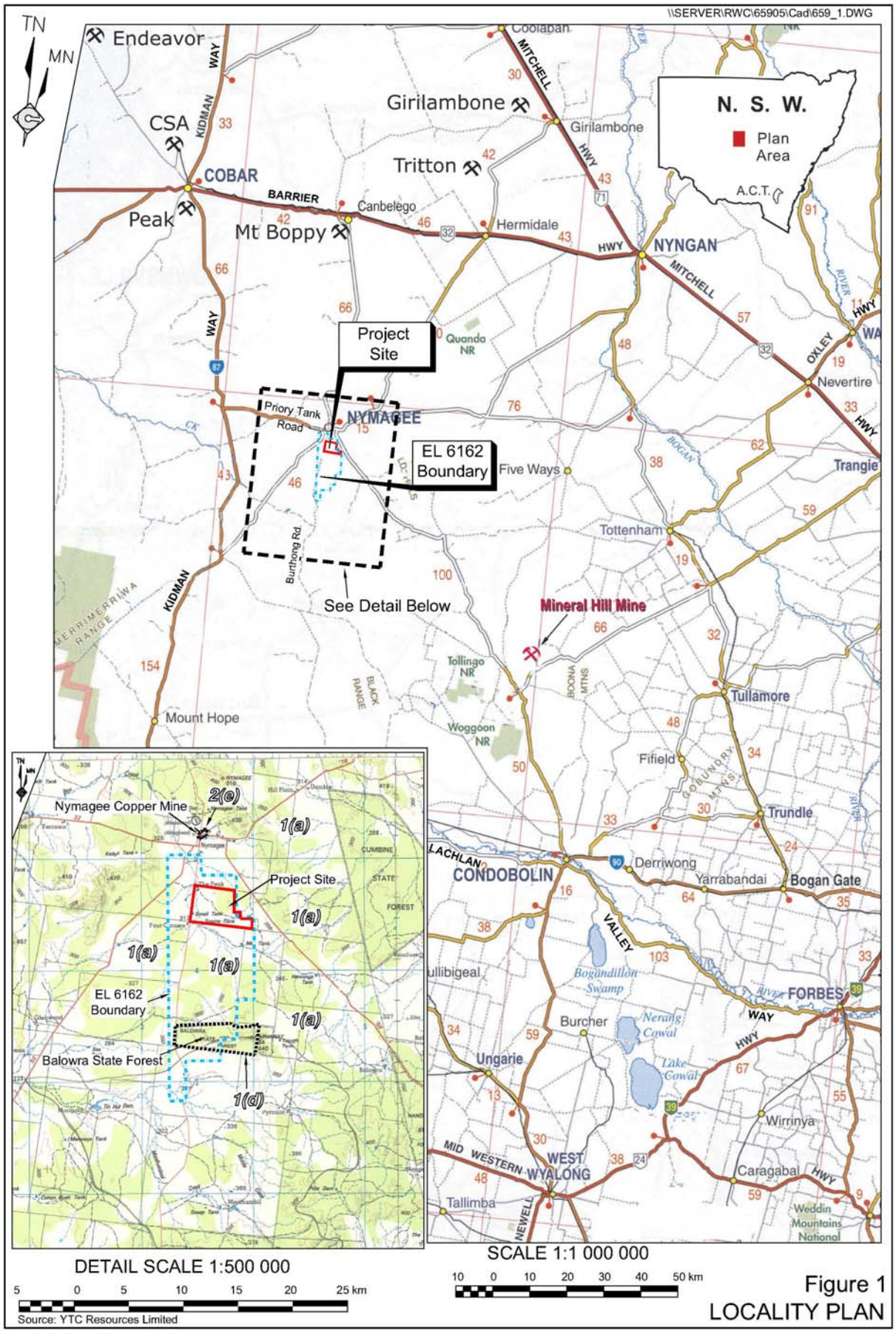
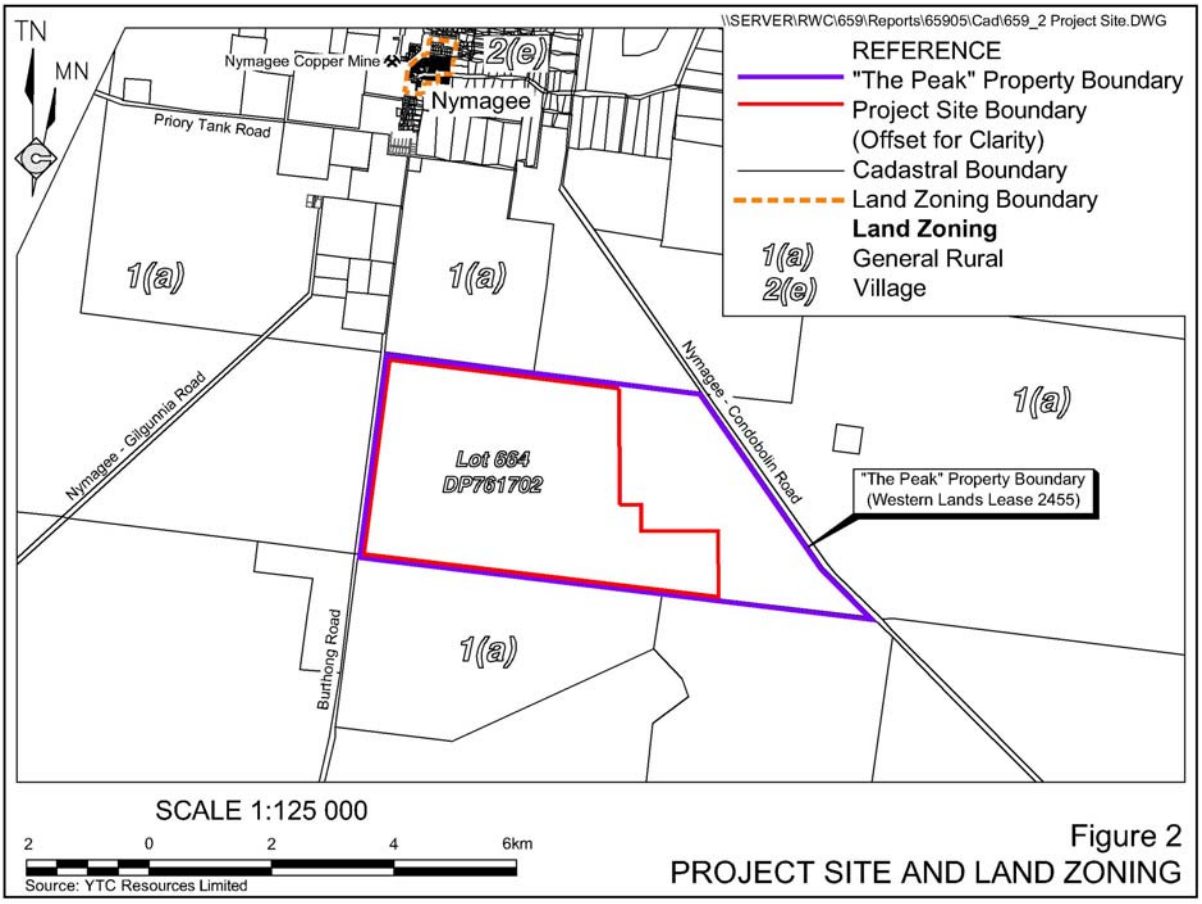


Figure 1
LOCALITY PLAN



WLL2455 is approximately 2 128ha and is adjacent to the Burthong Road on the western boundary and the Nymagee-Condobolin Road on the eastern boundary.

The Project Site falls under Zone 1(a) General Rural category according to the *Cobar Local Environment Plan 2001* (Cobar LEP). Land zoning within and surrounding the Project Site are shown in **Figure 2**.

The Project Site is wholly managed by the Proponent and has been subject to grazing for over 100 years. More recently, the Project Site has been subject to extensive exploration drilling by Triako Resources Limited, CBH Resources Limited and the Proponent.

1.4 SURROUNDING MINING OPERATIONS

There are five active and one inactive mining operations within 135km radius of the Project Site. These are:

- Peak Gold Mines (NewGold);
- CSA Mine (CMPL – Glencore);
- Endeavor Mine (CBH Resources);
- Tritton and Girilambone Copper Mines;
- Mineral Hill Mine; and
- Mt Boppy Mine (inactive).

1.5 MANAGEMENT OF INVESTIGATIONS

The preparation of this document has involved a study team managed by Mr Mitchell Bland (B.Sc. (Hons), MEcon. Geol., LLB (Hons)), Principal Environmental Consultant with R.W. Corkery & Co Pty. Limited. Dr Nagindar Singh (BSc, MSc, PhD) of the same Company has assisted with the preparation of the document. Peer review of the document was undertaken by Mr Rob Corkery (B.Sc. (Hons), M.Appl. (Sc)), Principal with the same Company.

In addition the following representatives of the Proponent assisted with the preparation of this document.

- Mr Rimas Kariatis (BAppSc (Hons), CEO and Director, YTC Resources Limited).
- Mr Dean Fredericksen (MSc. (Hons)), Hera Project Manager.
- Steve Kendrick, Project Manager GR Engineering Perth.
- Mr Sean Pearce (BE(Mining), MProf Acct), General Manager – Hera Project.

Strong emphasis has been, and will continue to be, placed upon a multi-disciplinary team approach to the design of the Project, the description of the existing environment, identification of key issues, development of appropriate safeguards and assessment of impacts. The following specialist consultancies have been commissioned to undertake an initial assessment of the existing environment and identify potential constraints posed by the Project.

- Ecology and Heritage – OzArk Environmental and Heritage Management Pty Ltd.
  - Mr Phil Cameron (B.Sc., Ass.Dip.App.Sc.).
  - Mr Ben Churcher (BA (Hons), Dip. Ed.).
- Surface Water, Soils and Land Capability – SEEC.
  - Mr Mark Passfield (B.Sc (Hons), Eng. Geology & Geotechnics).
- Groundwater – The Impax Group.
  - Mr James Morrow (B.Eng. Env (Hons)).
- Traffic and Transportation – Traffic Solutions Pty Ltd.
  - Mr Craig Hazell (Assoc.Dip.Eng.).
- Noise and Blasting – Spectrum Acoustics.
  - Dr Neil Pennington (PhD, B.Sc (Physics), B.Math (Hons)).
- Air Quality and Greenhouse Gas – ENVIRON Australia Pty Ltd.
  - Mr Scott Fishwick (B.Sc).

On receipt of Director-General's requirements (DGRs) for the *Environmental Assessment*, the specialist consultant assessments will be completed to provide Project impacts and recommendations for necessary design and operational safeguards.

2. BACKGROUND TO THE PROJECT

2.1 INTRODUCTION

The Hera deposit is a high grade gold and base metal deposit comprising sub-vertical and sub-parrallel base metal and gold lenses.

The Hera deposit was discovered by Pasminco in 2001 and advanced to pre-feasibility status by Triako Resources Limited in the period 2002 to 2006. The Hera Project was then acquired by CBH Resources Limited following the takeover of Triako Resources Limited in 2006.

On 18 June 2009, the Proponent announced it had reached agreement to purchase a 100% interest in the Hera Project and an 80% interest in the adjacent Nymagee Joint Venture, from CBH Resources Limited. The Proponent is now finalising a Definitive Feasibility Study (DFS) for the Hera Project.

This section provides an overview of the mineral authorities held by the Proponent, a description of the geology and mineralisation within and surrounding the Project Site and an overview of the resources and reserves that underpin the Project.

2.2 EXISTING MINERAL AUTHORITIES

The Project is wholly contained within Exploration Licence EL6162 which covers an area of approximately 140km^2 (**Figure 2**). The licence was granted on 26 November 2003 and is currently under renewal.

In April 2007, the then NSW Department of Primary Industries approved the construction of an exploration decline for the purposes of bulk sampling as a Category 3 exploration activity under Part 5 of the *Environmental Planning and Assessment Act 1979* (The "Part 5 Approval").

2.3 GEOLOGY, PREVIOUS MINING EXPLORATION AND RESOURCES AND RESERVES

2.3.1 Historic Mining Operations

No significant historical mining activities have been undertaken within the Project Site.

The Kershaw North Shaft is listed as having been worked from 1903 to 1906 (Suppel and Gilligan, 1993) although no production was recorded from this site. This one shaft (10m to 15m deep) occurs at the top of a small hill immediately to the east of the Hera deposit.

Within a 2km radius of the Hera deposit, several large quartz veins have been prospected by shallow pits and some material may have been removed for use as smelter flux at the Nymagee Copper Mine.

The Nymagee Copper Mine, located 4.5km to the north of the Project Site, was operated between 1881 and 1917 and produced approximately 420 000 of ore at a grade of 5.8% copper. The ore was mined from a series of steeply dipping ore shoots striking sub-parallel to the thinly bedded turbidite host sequence.

Mining operations consisted of a number of vertical access shafts sunk on or adjacent to the outcropping lodes. Mining was conducted on eight major levels to a total vertical depth of some 300m below surface. Additionally, a number of shallow open pits and cave zones down to the first underground level were established to supply ore. Surface infrastructure consisted of smelter and processing operations. These facilities have largely been removed, however, a large slag dump remains. The Proponent maintains an 80% interest in a Joint Venture over the Nymagee Copper Mine and surrounding tenements, and is currently actively exploring the area for further copper mineralisation.

2.3.2 Previous Exploration Operations

Previous exploration over EL6162 includes extensive geochemistry, geophysics and drilling. The southern half of EL6162 has been tested with regional stream sediment, BLEG and lag sampling and the entire licence area has been tested with a detailed aeromagnetic and radiometric survey. **Table 1** shows a summary of exploration activities conducted to date.

2.3.3 Hera Deposit Mineralisation

Mineralisation at the Hera deposit consists of a number of sub-parallel lenses of intensely anastomosing veins and clast-supported to matrix-supported breccias containing pyrrhotite, sphalerite, galena, pyrite, chalcopyrite and gold, with minor to trace cubanite and niccolite.

Host sandstones, siltstones and possible minor volcanics (dacites) are pervasively silicified and sericitised, with varying green chlorite and biotite alteration and commonly contain disseminated, non-magnetic pyrrhotite, typically aligned parallel to cleavage. Quartz veining is common and several zones of milky white quartz veins, up to 1m thick, are spatially associated with sulfide mineralisation. Hera mineralisation is characterised by moderate nugget effects for both gold (approximately 50%) and zinc (approximately 40%).

Table 1
Summary of Exploration Conducted Within EL6162

Page 1 of 2

Prospect	Lease	Company	Exploration Completed and Results
Hera Formerly Kershaw's Prospect	EL0716; EL1243	Buka Minerals	3 DDH; rockchip sampling; auger drilling; gravity; ground magnetics
		Esso Minerals	3 DDH; ground magnetics, gravity, IP
	EL2065	CRAE	Mapping; rockchip sampling; RAB; reassay Esso DDH; EM - no anomaly; 2 DDH – sub economic base metal mineralisation, Hera Main Lens discovery hole
	EL2065	BCSC	RAB Hera to Nymagee – 6 anomalous areas; 6 DDH; BCL stream sediments
	EL2065	Clutha	RAB; soil sampling; IP
	EL5591	Pasminco	13 PDH; RC/DDH; DHEM; IP; soil sampling; official discovery of Hera Main Lens
	EL6162	Triako Resources	Data review, 70 RC/DDH, 20 RC, 61 AC, soil sampling. rock chip sampling, petrography, downhole EM, ARD, metallurgy, archaeology, fauna, flora studies, resource estimation, mine planning
	EL6162	CBH Resources	19 RC/DDH, 6 RC, petrography, resource estimation, mine planning

Table 1 (Cont'd)
Summary of Exploration Conducted Within EL6162

Page 2 of 2

Prospect	Lease	Company	Exploration Completed and Results
Shed Paddock	EL2065	CRAE	2 DDH
Hebe Formerly Kershaw's South Prospect	EL0709	Buka Minerals	Rockchip sampling; auger drilling
	EL1243	Buka Minerals	Ground magnetics, gravity
	EL2065	CRAE	Mapping; rockchip sampling; RAB; EM
	EL5247	Savage	areomagnetics
	EL5591	Pasminco	RC; IP; soil sampling
Hebe South	EL5591	Pasminco	Soils – transported cover but anomalous Pb >200ppm
N17	EL0709	Buka Minerals	
	EL2065	CRAE	RAB; EM – no anomaly
N18	EL0709	Buka Minerals	Mapping; rockchip sampling; ground magnetics; auger – no anomalies
N19 (M2)	EL0709	Buka Minerals	Auger – up to 360ppm Pb, 200ppm Cu; ground magnetic; BLEG soils
	EL3274	Dowmill / Placer	Auger – no anomalies
	EL5591	Pasminco	6 PDH – no anomalous results but not considered effective test
N23	EL0709; EL1243	Buka Minerals	rockchip sampling - up to 5ppmAu, 3.7%Pb, 0.16%Zn 3 DDH – JNY1 up to 2.76ppm Au. A JNY4 was drilled but no results reported.
	EL1149	Jododex	IP; soil sampling – no anomalies
	EL3274	Dowmill / Placer	Rockchip sampling – but not as anomalous as Buka
N24		Buka / Jododex	Rockchip sampling; ground magnetics
N26		Buka / Jododex	1 DDH – no anomalous geochem, only 2 samples. NB qtz + tourm veining. Magnetic susceptibility shows anomaly was tested in part.
N23 – N26		Dominion / Buka	Lag sampling- values to 210ppm Pb rockchip sampling - up to 440ppmPb,
Dominion	EL4262	Dominion	Lag sampling - values to 920ppm Pb, 21ppb Au
	EL5591	Pasminco	18 shallow RC – up 6m @132ppm Au and anomalous Cu. Only partial test
Anomaly III, V		Union Corp.	
Beloura Tank	EL0152	Cyprus	IP; 3 PDH – no significant results
Source: YTC Resources Limited			

The sulfide lenses strike around 346° true and dip steeply to the west (>80º). Based on drilling, the top of the sulfide package occurs approximately 22m below surface and appears to plunge moderately to the south at approximately 45°, extending along strike for at least 550m.

Drilling to date has outlined a number of lenses of sulfide and occasionally gold mineralisation. Of these the Main Lens (North and South), Hays South, Hays North and Far West Lens have been identified to host economic mineralisation and are the current subject of a mining study. (**Figure 3**).

Mineralisation within the other structures which are all immediately adjacent to the Main Lens has potential to be economic however current drill densities are insufficient to enable complete interpretation of the structures and thus determination of the economic potential. Further drilling and interpretation will be conducted at a later date.

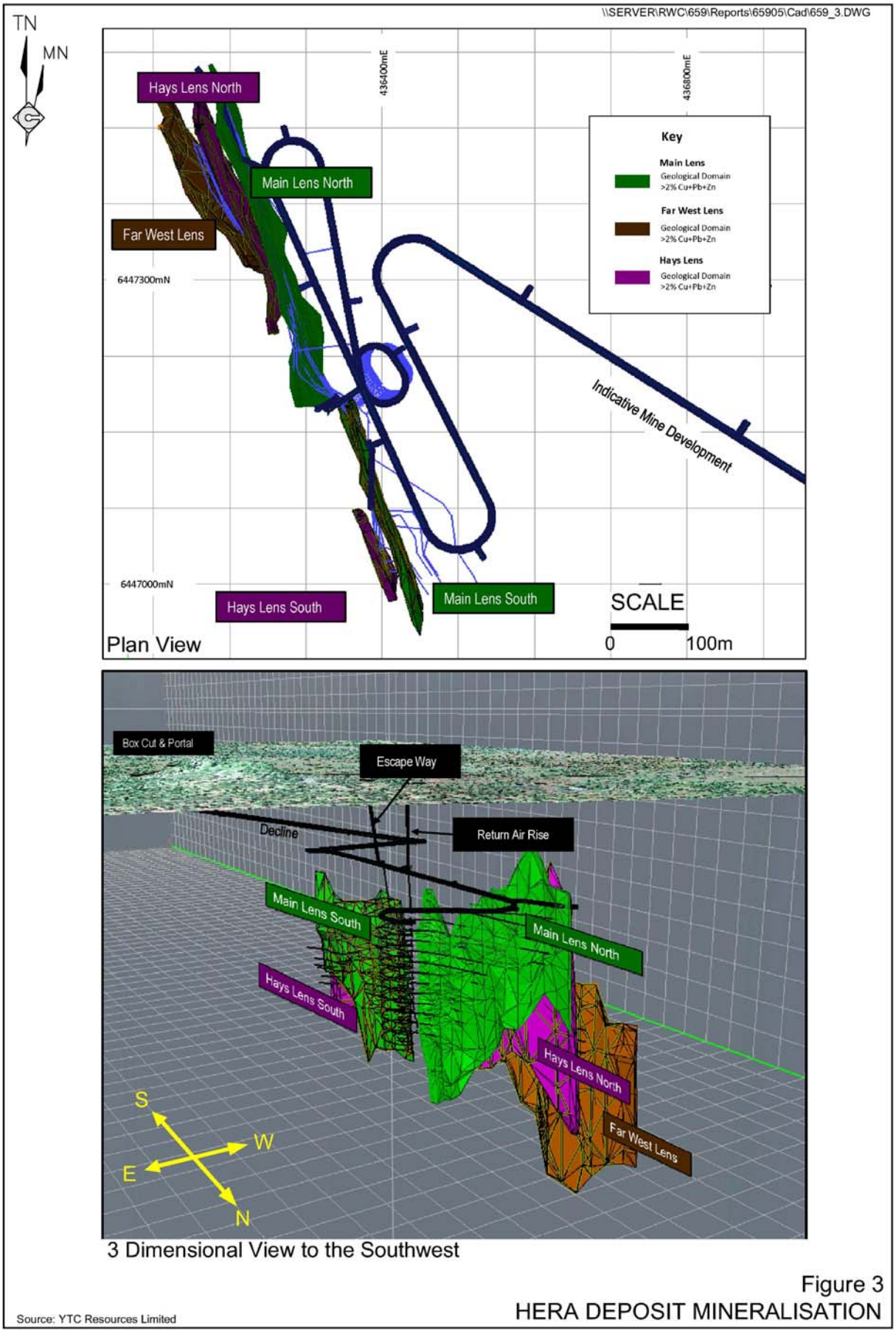


Figure 3
HERA DEPOSIT MINERALISATION

Source: YTC Resources Limited

An East-West striking fault (the Offset Fault) has been interpreted to off set the Main Lens mineralisation in a sinistral sense by approximately 25m. The Offset Fault has not always been evident in drill core, possibly due to its orientation which is sub-parallel to the trend of drilling and also due to re-healing of the faults structure with quartz fill. A fault of this orientation has, however, been mapped at surface and has its locus at the Kershaw North shaft.

Further detailed description of the Hera mineralisation is available on the Proponent's website. However, in summary, mineralisation associated with the Hera deposit may be classified as follows.

- General narrow lenses with quite variable economic widths within the lens along strike. Main Lens contains the majority of resources with additional mineralisation hosted by Hays South, Hays North and Far West Lenses..
- Sub-vertical dip for both Main Lens and Far West Lens.
- Strike - approximately 340º true.
- Strike length - 600m with potential for extensions along strike to both north and south.
- Depth - 100m to 470m below surface, with potential for deeper extensions.
- Host rock - Generally homogeneous siltstone/ sandstone with minor dacitic volcaniclastics. Bedding dips to west at 60º to 70º and strikes 340º to 350º true.
- Minor jointing and significant cleavage development.
- Significant gold grades are not always associated with base metal mineralisation but can be associated with quartz veining outside the main base metal mineralised zone.

2.3.4 Resources and Reserves

A Joint Ore Reserves Committee–compliant mineral resource estimate for the Hera Deposit was completed by YTC Resources Limited in June 2010 and updated in June 2011. The June 2011 Estimates at a cut-off of A$125 per tonne is presented in **Table 2**.

Table 2
Mineral Resource Estimates for Hera Deposit

Category	Weight of ore in tonnes	Au g/t	Ag g/t	Pb %	Zn %	Cu %	Au_Eq g/t	Contained Au_Eq (Oz)
Indicated	2 113 000	4.2	17.0	2.8	3.9	0.2	9.2	
Inferred	330 000	3.5	14	2.3	3.3	0.1	7.5	
TOTAL	**2 444 000**	**4.1**	**16.7**	**2.8**	**3.8**	**0.2**	**8.6**	**677 200**
Source: YTC Resources Limited								

This estimate is supported by a database of 169 diamond core drill holes comprising mostly HQ core with some NQ sized core. YTC Resources Limited completed 32 holes during the period November 2009 to April 2010 to supplement this database and to provide for revisions in interpretations and classification relative to previous estimates.

Mineral Resource estimates have only been completed for the Main Lens, Hays South, Hays North and Far West lenses (**Figure 3)**. Additional mineralisation that was encountered during the drilling has been modelled but not included in the mineral resource estimates as yet. Additional data and their interpretation that will be determined from this modelling exercise will be used to obtain better estimates of the mineral resources available in the Project Site.

3. PROJECT OBJECTIVES

The Proponent's objectives in constructing and operating the Hera Project are as follows.

- Safely mine the identified reserves.
- Operate the Project in a manner that would minimise surface disturbance and impacts on surrounding residents and the local environment.
- Implement a level of management control and mitigation measures that ensures compliance with appropriate environmental criteria and reasonable community expectations.
- Develop and operate the Project in compliance with all relevant statutory requirements.
- Create a final landform that is suitable for a post-mining land use of agriculture or nature conservation and one that is acceptable to the surrounding community.
- Continue to maintain an open and honest relationship with the surrounding community.
- Establish a facility that can process additional mineral resources that may be identified within or in the vicinity of the Project Site, subject to further development consent or project approval.
- To achieve the above objectives in a cost-effective manner to ensure security of employment of the Proponent's employees and contractors and the continued economic viability of the Proponent.

The expected outcomes of the Project are as follows.

- Development of an operation that will contribute to the local, regional, State and national economies.
- Production of gold, silver and base metals to meet local and international demands.
- Rehabilitation of the Project Site to form a low maintenance, geotechnically stable, non-polluting and sustainable final landform that would blend with surrounding landforms and would be suitable for a final land use of agriculture or nature conservation.

4. PROJECT OVERVIEW

4.1 INTRODUCTION

The Hera Project would mine and process up to 350 000t of metalliferous ore per year to produce gold-silver doré (unrefined bars) and approximately 50 000t per year of bulk copper-zinc-lead concentrate for sale to both domestic and international customers.

The Project would require establishment of an underground mine, Processing Plant, run-of-mine (ROM) pad, temporary Waste Rock Emplacement, Tailings Storage Facility, Mine Camp, site offices and ancillary infrastructure for mining and related activities.

The operational life of the mine would be a total of nine years, comprising 1.5 years of site establishment activities, 5.5 years of mining and processing operations and 2 years of rehabilitation operations.

The Hera Project would comprise activities that have been approved previously (see Section 4.2) and new activities that would require approval (see Section 4.3).

4.2 APPROVED ACTIVITIES

A number of components of the Hera Project were approved by the then Department of Primary Industries in 2006 under Part 5 of the *Environmental Planning and Assessment Act 1979* following preparation of a *Review of Environmental Factors* (RWC, 2006).

- Construction and use of infrastructure required for an exploration decline including a box cut, portal and decline, magazine and ventilation rises.
- Construction and use an integrated ore stockpile area and temporary Waste Rock Emplacement.
- Installation and use of one or more diesel generators and an associated fuel bay.
- Construction and use of site offices, ablutions facilities, vehicle parking, workshop, laydown area and associated infrastructure.
- Establishment of onsite communications facilities.
- Construction and use of water management structures.
- Construction and use of an access road (Light Vehicle Access Road).
- Extraction of a 20 000t bulk sample.

A site layout of all approved activities is shown in **Figure 4.**

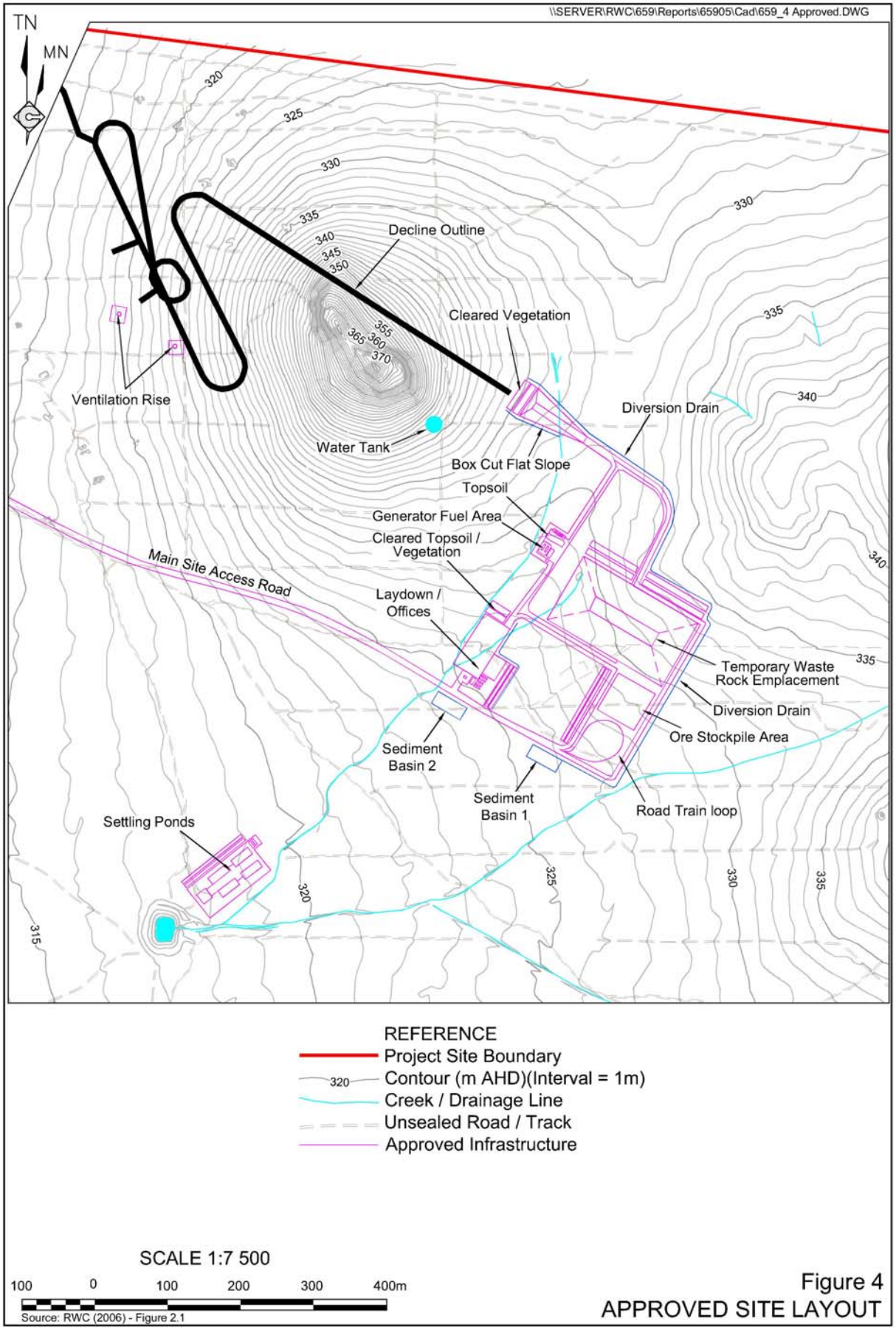


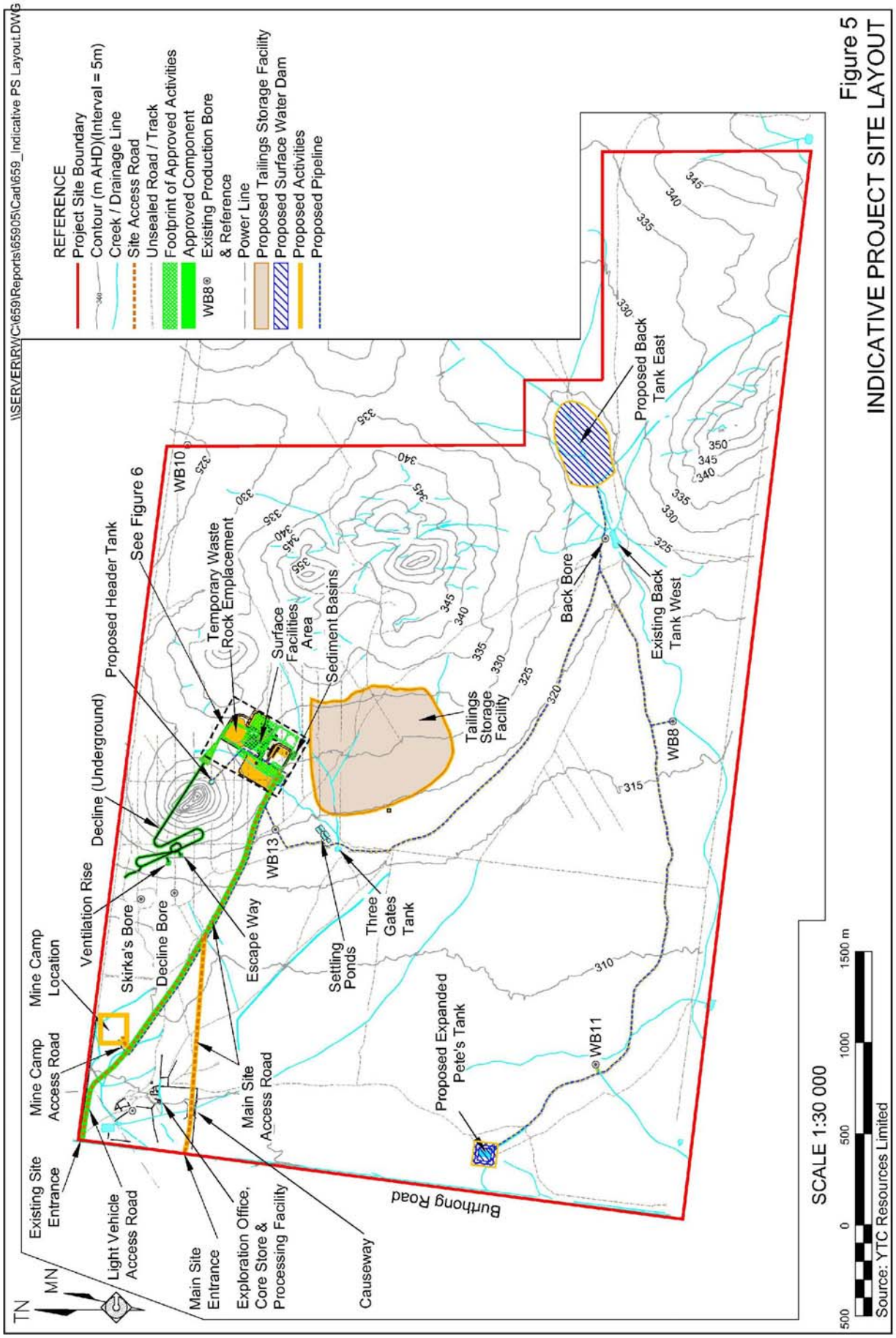
Figure 4
APPROVED SITE LAYOUT

4.3 PROPOSED ACTIVITIES

Project approval is sought for the following Project-related activities (see **Figures 5** and **6**).

- Extraction of waste rock and ore material using underground sublevel open-stope mining methods. The maximum rate of extraction of ore material throughout the Project life would be approximately 350 000t per year.
- Construction and use of a Surface Facilities Area (**Figure 6**) that would incorporate a range of approved infrastructure, including expanded Proponent's and Contractor's site offices, ablutions facilities, vehicle parking, power station, fuel storage, refuelling area, workshop and laydown areas.
- Construction and use of a Processing Plant within the Surface Facilities Area comprising crushing and grinding, gravity separation, flotation, leach and gold recovery circuits and ancillary infrastructure.
- Construction and use of a temporary Waste Rock Emplacement, incorporating an acid rock drainage encapsulation area.
- Construction and use of a Tailings Storage Facility.
- Construction of a Mine Camp to house mine personnel.
- Construction and use of a surface water harvesting system, including expansion of Pete's Tank and construction of Back Tank East and associated water reticulation system.
- Construction and use of the Main Site Access Road and the associated intersection to allow site access from Burthong Road.
- Transportation of concentrate from the Project Site to the Proponent's customers via public roads surrounding the Project Site.
- Construction and use of ancillary infrastructure, including soil stockpiles, core storage yards, internal roads and tracks, and sediment and erosion management structures not already approved.
- Construction and rehabilitation of a final landform that would be geotechnically stable and suitable for an end land use of agriculture or nature conservation.

It is noted that during the life of the Project, the Proponent proposes to undertake additional exploration drilling to further define the mineralisation identified to date, and to identify any additional resources, both within and in the vicinity of the Project Site. Extraction of additional mineralisation does not form a part of this application, and would be the subject of a subsequent application.


\\SERVER\RW\C\1659\Reports\65905\Cad\659_Indicative PS Layout.DWG
REFERENCE
Project Site Boundary
Contour (m AHD)(Interval = 5m)
Creek / Drainage Line
Site Access Road
Unsealed Road / Track
Footprint of Approved Activities
Approved Component
Existing Production Bore & Reference
Power Line
Proposed Tailings Storage Facility
Proposed Surface Water Dam
Proposed Activities
Proposed Pipeline
WB8
WB10
WB11
WB13
See Figure 6
Proposed Header Tank
Decline (Undergound)
Ventilation Rise
Mine Camp Location
Mine Camp Access Road
Skirka's Bore
Decline Bore
Escape Way
Temporary Waste Rock Emplacement
Surface Facilities Area
Sediment Basins
Settling Ponds
Three Gates Tank
Tailings Storage Facility
Proposed Back Tank East
Back Bore
Existing Back Tank West
Proposed Expanded Pete's Tank
Main Site Access Road
Existing Site Entrance
Light Vehicle Access Road
Main Site Entrance
Exploration Office, Core Store & Processing Facility
Causeway
Burthong Road
TN
MN
SCALE 1:30 000
500 0 500 1000 1500 m
Source: YTC Resources Limited
Figure 5
INDICATIVE PROJECT SITE LAYOUT

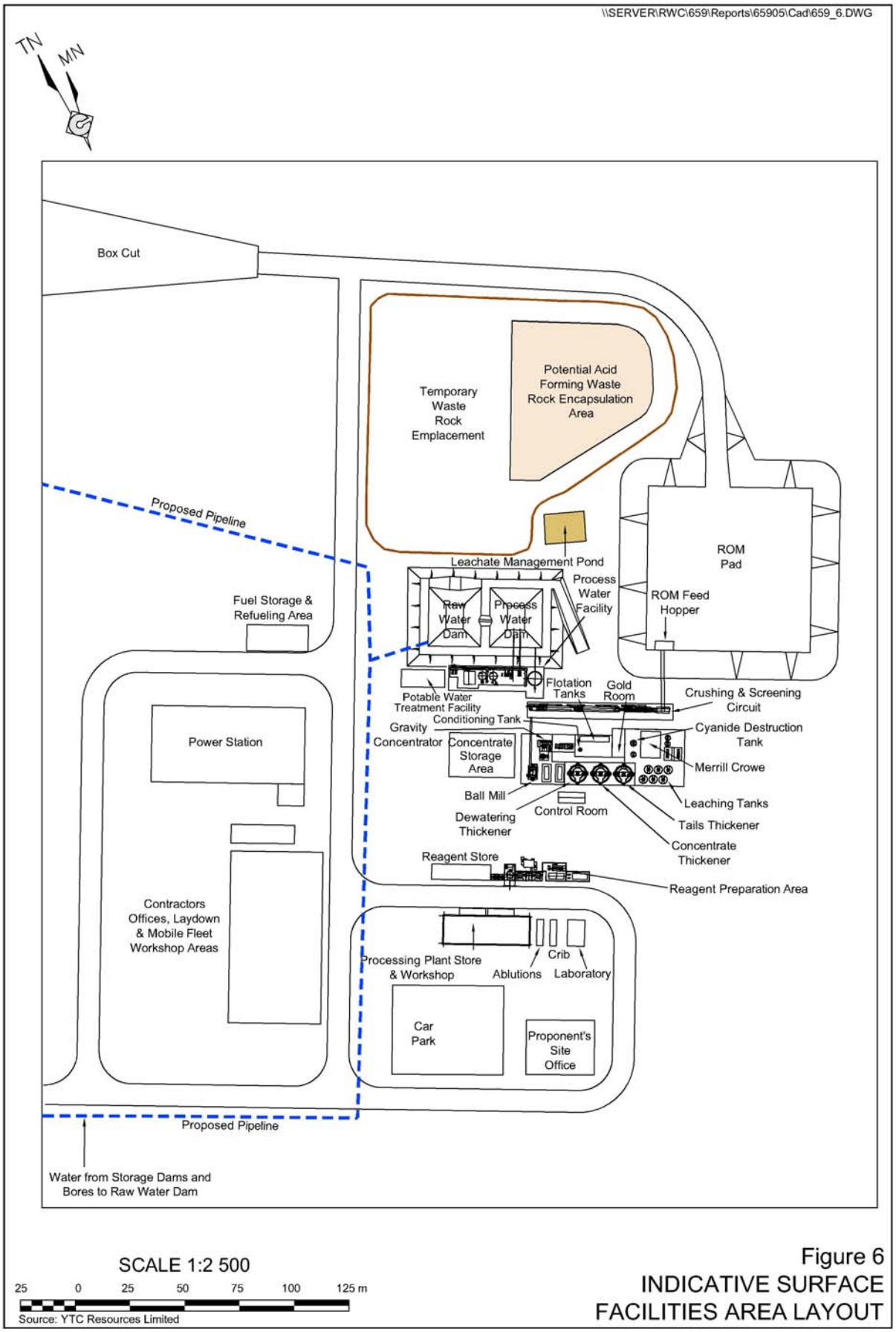


Figure 6
INDICATIVE SURFACE FACILITIES AREA LAYOUT

4.4 APPROVALS REQUIRED

The Proponent anticipates that the following approvals will be required for the Project.

- Project Approval – Minister for Planning or their delegate.

  Project approval will be required from the Minister for Planning or their delegate for the Project under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act), as the total cost of the Project has been estimated to be greater than $30 million.

  The Proponent notes that the existing approved activities described in Section 4.2 were approved under Part 5 of the EP&A Act. The Proponent anticipates that these activities would be incorporated under the project approval, should it be granted.

- Environment Protection Licence –Office of Environment and Heritage.

  An Environment Protection Licence, under the *Protection of the Environment Operations Act 1997*, for underground mining operations, mineral processing operations and use of the Tailings Storage Facility will be required. It is anticipated that the licence will also identify licensed discharge points and discharge conditions.

- Mining Lease – Department of Trade and Investment, Regional Infrastructure and Services – Mineral Resources and Energy.

  The Proponent currently holds EL6162 over the Project Site (see Section 1.3). As a result, a mining lease covering the area of proposed mining operations will be required from Mineral Resources and Energy. An application for such a lease has not been submitted as yet.

- Water Licence/Water Access Licences – NSW Office of Water.

  The Proponent currently holds licences 85BL243254, 85BL256002 and 85BL256001 for the extraction of up to 147ML per year from three locations. A range of additional test bores have been constructed and the Proponent has commenced discussions with the NSW Office of Water in relation to distributing the groundwater allocation from the existing licences in a manner that would include the newly constructed bores and the proposed underground mine.

- A Section 138 Permit –Cobar Shire Council.

  A permit or deed under Section 138 of the *Roads Act 1993* would be required for the construction of the intersection of the Main Site Access Road and Burthong Road and an upgrade of the existing site intersection.

- Dam Safety Approval – Dam Safety Committee.

  The Proponent anticipates that the Tailings Storage Facility will be a prescribed dam under the *Dam Safety Act 1978*. As a result an approval from the NSW Dams Safety Committee will be required for the design and construction of the Tailings Storage Facility.

- Explosives Storage and Use Licence – WorkCover Authority NSW.

  A licence issued by the WorkCover Authority of NSW for the storage and use of explosives. It is noted that such a licence will be granted only when Mineral Resources and Energy approves a Security Plan for the storage and handling of explosives (including explosive precursors).

- Dangerous Goods Storage and Use Licence – WorkCover Authority NSW

  A licence from WorkCover Authority NSW for storage and use of dangerous goods, namely sodium cyanide.

Following project approval, subsequent approvals in accordance with the *Mining Operations Plan* or *Rehabilitation and Environmental Management Plan* requirements of the *Mining Act 1992* and mining lease conditions, will be necessary.

The Proponent understands that further approval will not be required for the harvesting of surface water within the Project Site as the Proponent would ensure that all surface water harvesting structures are constructed on first or second order ephemeral streams.

The Proponent notes that the Project Site is subject to an existing approval under Part 5 of the EP&A Act for the construction of a box cut, exploration decline and the extraction of a 20 000t bulk sample.

5. PLANNING ISSUES

5.1 PERMISSIBILITY OF THE PROJECT

The Project Site is located within the Cobar Shire Local Government Area and permissibility of development is governed by the *Cobar Local Environment Plan 2001* (Cobar LEP). Under the Cobar LEP, the Project Site falls under Zone 1(a) General Rural category. **Figure 2** presents the land zoning within and surrounding the Project Site.

Clause 10 of the Cobar LEP identifies the objectives of Zone 1(a) (General Rural) are:

1. To promote the conservation of productive land for agricultural and grazing purposes.
2. To permit the development of appropriate agricultural land uses and prevent development of inappropriate non-agricultural land uses such as small lot rural residential subdivision.
3. To permit the development of mines, extractive, offensive and hazardous industries, but only in an environmentally and sustainable manner.
4. To permit some non-agricultural land uses and agricultural support facilities, such as rural supply industries, tourist facilities, farm stay facilities, and the like which are in keeping with other zone objectives and which will not have an adverse effect on agricultural productivity.

Mining is permissible in the Project Site with consent within this zone.

5.2 CONSIDERATIONS OF STATE PLANNING INSTRUMENTS

5.2.1 State Environmental Planning Policy (Major Development) 2005

Clause 6 of the *State Environmental Planning Policy (Major Development) 2005* (Major Development SEPP) identifies that development of the kind specified in Schedule 1 of the Major Development SEPP is declared to be a Project. Paragraph 5(1)(b) of Schedule 1 identifies development for the purposes of mining-related works with a capital cost of more than $30 million as development to which the Major Development SEPP applies.

The Proponent estimates that the capital cost for the Hera Project may be up to $70 million. For this reason the Proponent considers the Hera Project to be a Major Project for which project approval under Part 3A of the EP&A Act would be required.

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

The *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP) was gazetted on 17 February 2007 and specifies matters requiring consideration in the assessment of any mining-related development. These matters include the following.

- The compatibility of the proposed mine with surrounding land uses.
- The compatibility of the proposed development with other mining, petroleum production or extractive industry.
- Potential impacts on issues associated with natural resource management and environmental management.
- The efficiency of resource recovery and minimisation of the creation of waste.
- Consideration of alternative means of product transportation other than by road and that a code of conduct for the transport of materials on public roads is prepared.
- Consideration of rehabilitation of the land affected by the development.

An assessment of how each of these considerations is addressed will be provided within the *Environmental Assessment*.

5.2.3 State Environmental Planning Policy (Rural Lands) 2008

The aims of *State Environmental Planning Policy (Rural Lands) 2008* (Rural Lands SEPP), as considered relevant to the Project, are to:

a. facilitate the orderly and economic use and development of rural lands for rural and related purposes;

b. implement measures designed to reduce land use conflicts; and

c. identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations.

Specifically, and as described in Clause 12, Rural Lands SEPP aims to provide for the protection of agricultural land:

i. that is of State or regional agricultural significance;

ii. that may be subject to demand for uses that are not compatible with agriculture; and

iii. if the protection will result in a public benefit.

The Project is considered with respect to these aims.

- The land that would be affected by the Project has not been identified as State or regional significant agricultural land by Schedule 2 of the Rural Lands SEPP.
- The Project would require a relatively small proportion of the agricultural land in the locality and, as demonstrated at numerous other mine sites where agricultural activities are undertaken concurrently with mining, would not be incompatible with continued agricultural land use surrounding the Project Site.
- The protection of the land within the Project would not provide any public benefit. In fact, the employment and local economic stimulus that would be generated by the Project would be of far greater public benefit than the current grazing.

As a result of the above considerations, Rural Lands SEPP is not considered further in this document.

5.2.4 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

Hazardous and offensive industries, and potentially hazardous and offensive industries, relate to industries that, without the implementation of appropriate impact minimisation measures, would, or potentially would, pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment. A risk screening of the Project will be presented in the *Environmental Assessment* in accordance with the document entitled *Applying SEPP 33 2nd edition*, (DUAP, 1997). The Proponent notes that the hazardous goods that would be used within the Project Site would include the following.

- Diesel and other hydrocarbons that would be stored and used in accordance with a comprehensive *Hydrocarbon Management Plan*.
- Detonators, boosters and packaged explosives would be stored within approved magazines. Bulk explosives, if required, would be brought to the Project Site on a daily or as needs basis by an authorised contractor.
- Processing chemicals would be used, stored and managed using protocols developed under the *Protection of the Environment and Operations Act 1997* (POEO Act) to minimise air and water pollution from accidental chemical spills.

5.2.5 State Environmental Planning Policy No. 44 – Koala Habitat Protection

Cobar Local Government Area has not been identified in Schedule 1 of *State Environmental Planning Policy No. 44 – Koala Habitat Protection* as an area that could provide habitat for koalas. As a result, this policy will not be required to be considered.

6. PROJECT DESCRIPTION

6.1 INTRODUCTION

This section provides an overview of the Project activities. Detailed descriptions of the activities will be provided in the *Environmental Assessment* to be prepared for the Project. This document has been prepared to provide background information on the Project to the relevant government agencies and interested members of the community surrounding the Project Site.

6.2 INTRASTRUCTURE ESTABLISHMENT

6.2.1 Introduction

Infrastructure establishment would comprise installation and construction of the following prior to the commencement of mining and processing activities.

- Establishment of the fuel storage, refuelling area, and power station.
- Construction of the Main Site Access Road and the upgrade of the existing site access road (Light Vehicle Access Road), and the construction a new intersection and the upgrade of the existing site entrance with Burthong Road.
- Installation of sediment and erosion control structures and water harvesting structures.
- Construction of a box cut and portal and associated decline and underground development.
- Establishment of the Surface Facilities Area comprising:
  - ancillary facilities including Proponent and contractor offices, car park, ablution facilities, crib room, workshop facilities, store, hardstand and laydown area and services comprising electricity distribution network, communications, potable and operational water;
  - Processing Plant;
  - Run-of-Mine (ROM) pad.
- Establishment of the temporary Waste Rock Emplacement ;
- Construction of the Tailings Storage Facility;
- Establishment and operation of the Mine Camp.

6.2.2 Water Management

6.2.2.1 Sediment and Erosion Controls

The Proponent proposes to put in place appropriate water management structures in order to meet all legal obligations and landowner responsibilities with respect to water, erosion and sediment management to ensure that the Project would not adversely impact on the quality of water discharged from the Project Site. The structures would also ensure that surface water run-off from undisturbed sections of the Project Site would not mix with potentially sediment-laden water from disturbed sections of the Project Site.

The proposed water management structures within the Project Site are (see **Figure 5**):

- sediment basins;
- clean water diversions;
- dirty water containment bund(s) and seepage collection pond downslope from the Tailings Storage Facility;
- a settling pond complex comprising five separate ponds; and
- Three Gates Tank.

A water tank would be installed on the site for the storage of potable water that would be trucked in and a rain water tank would be installed adjacent to the workshop to supplement that supply.

Rain water and groundwater will be used to meet all water requirements for the Mine Camp (see Section 6.10.4.3). Potable water supply may be augmented by small reverse osmosis plant installed on site.

All water management structures would be constructed to the specifications identified in Landcon (2004) and DECCW (2008).

6.2.2.2 Water Requirements and Sources

The Project would require up to approximately 187ML of water per year for mining-related purposes, principally for processing (approximately 167ML/year) and dust suppression operations (approximately 20ML/year). Other mining-related water uses would include underground operations, equipment wash down and the Mine Camp water requirements (including in processing water requirements).

This water would be obtained in priority order from the following sources (see **Figure 5**).

i) Groundwater sourced from dewatering operations within the proposed mine.

ii) Stormwater run-off stored in the Three Gates Tank either following treatment in the settling ponds or captured directly.

iii) Stormwater run-off stored in the proposed expanded Pete's Tank or the proposed Back Tank East. These dams would store approximately 20ML and 90ML of water, respectively.

iv) Groundwater sourced primarily from four bores located within the Project Site namely, Back Bore and Bores WB8, WB11 and WB13.

It is likely that water from within the surface water storage dams would be available only intermittently. As a result, the Project would rely entirely on water sources i) and iv) for all operational water requirements during extended dry periods. However, when water from sources ii) and iii) is available, it would be used to allow the production bores and associated aquifers to be at least partially recharged.

6.2.3 Water Harvesting Structures

6.2.3.1 Surface Water Harvesting Structures

The Proponent would expand one existing surface water dam, namely Pete's Tank, and construct a new dam, namely Back Tank East to permit harvesting of surface water within the Project Site (**Figure 5**). Water harvested within these and other sediment and erosion control structures would be used within the Project Site for operational requirements. It is noted that the NSW Harvestable Rights do not apply to rural landholders in the Western Division, and thus are not applicable to the Project Site.

Table 3 presents the indicative capacities of all surface water harvesting structures within the Project Site. The Proponent has ensured that these structures are positioned on second-order creeks, in accordance with Section 53 of the *Water Management Act 2000* (**Figure 5**).

The proposed structures would be constructed with appropriate spillways capable of withstanding a 1 in 100 year annual recurrence interval (ARI) rainfall event without significant erosion. The dams would also be fitted with appropriate water reticulation equipment, including pumps and pipelines to permit transfer of water from the dams to the proposed water tank.

Table 3
Indicative Surface Water Storage Volumes

Dam Identifier	Indicative Volume (ML)
Pete's Tank	20
Back Tank East	90
Three Gates Tank	0.6
Sediment Basins	0.2
Settling Ponds	4
Total	114.8
Source: YTC Resources Limited.	

6.2.3.2 Groundwater Harvesting Structures

Groundwater would be sourced principally from the proposed underground mine, with additional water sourced from four production bores within the Project Site, namely Back Bore and Bores WB8, WB11 and WB13 (**Figure 5**).

Groundwater within the proposed underground mine would be pumped to the surface and stored within either the Header Tank (**Figure 5**) or the Raw Water Dam (**Figure 6)**. The daily rate of extraction would depend on the short-fall between the daily rate of extraction of groundwater from the underground workings and the daily Project water requirements.

In light of the above, the Proponent anticipates that sufficient groundwater resources exist within the Project Site for the proposed mining and ancillary operations.

6.2.3.3 Water Reticulation System

Groundwater and surface water for mining-related purposes would be pumped to the Raw Water Dam via a proposed pipeline (**Figure 4**). The proposed pipeline would be constructed of poly pipe and buried. The pipeline route would, wherever practicable, follow established tracks and would only disturb areas that are currently disturbed. Where the proposed pipeline route cannot be located along existing tracks, care would be taken to ensure that no vegetation more than 3m high would be disturbed.

6.2.3.4 Potable Water

Potable water is currently collected from all available roof surfaces into rainwater tanks, and this arrangement would continue during the life of the Project.

Additional potable water may be transported in bulk to the Project Site, if required. Water for other ablutions purposes such as flushing of toilets may be sourced from the Three Gates Tank or the raw water dam.

6.3 SITE PREPARATION

6.3.1 Introduction

This sub-section describes the activities that would be undertaken during site establishment operations. These activities would comprise removal of surface vegetation and soil stripping. Prior to the commencement of site establishment operations, all areas to be disturbed would be surveyed and clearly marked to ensure that areas not required for the operation of the Project are not disturbed.

Significant areas of native vegetation have previously been removed or disturbed within the Project Site as a result of grazing, clearance of vegetation for historic mining operations and/or subsequent exploration activities. **Table 4** presents approximate areas that have been previously disturbed and indicative areas that would be disturbed during site preparation operations.

6.3.2 Vegetation Clearing

Vegetation within the Project Site is not classified as an Endangered Ecological Community. Native vegetation that would be removed has been classified as Benson 103 comprising Bimble Box and White Cypress Pine dominated and Benson 174 vegetation communities. It is anticipated that approximately 68 ha of vegetation will required to be cleared for the Project.

As there would be limited progressive establishment of the Project Site infrastructure, all vegetation clearing would occur in a single campaign. Prior to vegetation clearing operations commencing, a pre-clearing fauna inspection would be undertaken to ensure that any roosting or nesting fauna are identified and relocated.

During vegetation clearing operations, larger vegetation, if present, would be removed using a bulldozer with its blade positioned just above the surface so as not to disturb the groundcover and topsoil. Ground cover vegetation would be removed with the topsoil to maximise the retention of the seed bank and nutrients within the soil, as well as to minimise opportunities for erosion and dust lift-off between removal of the larger vegetation and soil stripping.

Table 4
Indicative Disturbance Areas – Previous and Proposed

Infrastructure Area	Previously Approved (ha)[1]	Proposed Activities (ha)[2]	Total Area (ha)
Surface Facilities Area, Box cut, portal and ventilation rises	4.8	8.8	13.6
Tailings Storage Facility	0	43.8	43.8
Main Site and Light Vehicle Access Road	1.8	2.8	4.6
Expanded Pete's Tank and proposed Back Tank East[3]	0	13.0	13.0
Mine Camp	0	1.4	1.4

Note 1: Relates to activities previously approved under the Part 5 Approval (see Section 1.7 and **Figure 2.1**).
Note 2: Relates to activities for which project approval is sought..
Note 3: Disturbance would be limited to the embankment walls and borrow pits. However, as entire footprint would intermittently be inundated, entire footprint of these structures has been used when calculating anticipated area of disturbance.

Source: YTC Resources Limited

Available seed would, wherever practicable, be harvested prior to clearing operations. Vegetation would not be mulched and would be stored for use during rehabilitation activities. Felled trees would be track-rolled to break up the larger trunk sections and all vegetation would be relocated to stockpile locations adjacent to each individual area of disturbance. The stockpiling of vegetation close to the source would provide for minimal handling and for easy access to it for rehabilitation purposes. Where practical, the vegetation stockpile would be located on the down-slope side of the infrastructure area to act as a natural sediment trap.

6.3.3 Soil Stripping

6.3.3.1 Introduction

Soils in the surface disturbance areas appear skeletal but they comprise both a topsoil (between 0.15m and 0.3m thick) and subsoil/parent material to at least 1m depth.

Two soil landscape units, namely the Yackerboon Land System and Kopyje Land System have been identified within the Project Site. A third soil landscape unit, namely the Boppy Land System has been identified to the northeast of the Project Site and would not be impacted by the Project. The Kopyje Land System occupies the southwestern-most section of the Project Site while the Yackerboon Land System occupies the remainder of the Project Site. Chemical and physical testing conducted on soils from representative areas within the Project Site indicate that the soils display a moderate to high erodibility, are non-saline and show negligible to slight dispersibility.

This section provides information on the soil stripping procedures to be adopted and precautions to be taken during the preparation of the surface site for infrastructure establishment.

6.3.3.2 Soil Stripping and Stockpiling Procedures

Topsoil would be stripped with the groundcover to ensure the maximum seed bank is retained, provide structure to the soils within the soil stockpiles and provide the best opportunity for groundcover to re-establish over the soil stockpiles. The stripped topsoil and subsoil would be pushed up by bulldozer and either loaded into trucks for transportation to the stockpile location or alternatively directly placed into those stockpiles using a bulldozer.

Standard soil stripping procedures to be adopted and management measures would be implemented during all site establishment activities.

6.4 UNDERGROUND MINING OPERATIONS

6.4.1 Introduction

This section provides an overview of the box cut and portal construction, decline development and stoping operations, stope back-filling, mining rate and sequence, and mining equipment that would be used.

6.4.2 Construction of the Box Cut and Portal

6.4.2.1 Introduction

This section provides an overview of the construction of the box cut and portal establishment prior to commencement of the underground development. It is noted that construction of the box cut and portal have been previously approved under the Part 5 Approval and the proposed box cut and portal would be generally in accordance with that proposed in that earlier application.

6.4.2.2 Layout of the Box Cut

Figure 7 depicts an overview of the indicative layout of the box cut which, when constructed, would be approximately 90m long, up to 45m wide and would have an indicative gradient of approximately 1:7 (V:H). The box cut would be constructed with side and end batters of approximately 1:1 (V:H). The portal face would be approximately1:0.25 (V;H) or 72^{o} and the overall surface elevation of the box cut would be approximately 335m AHD.

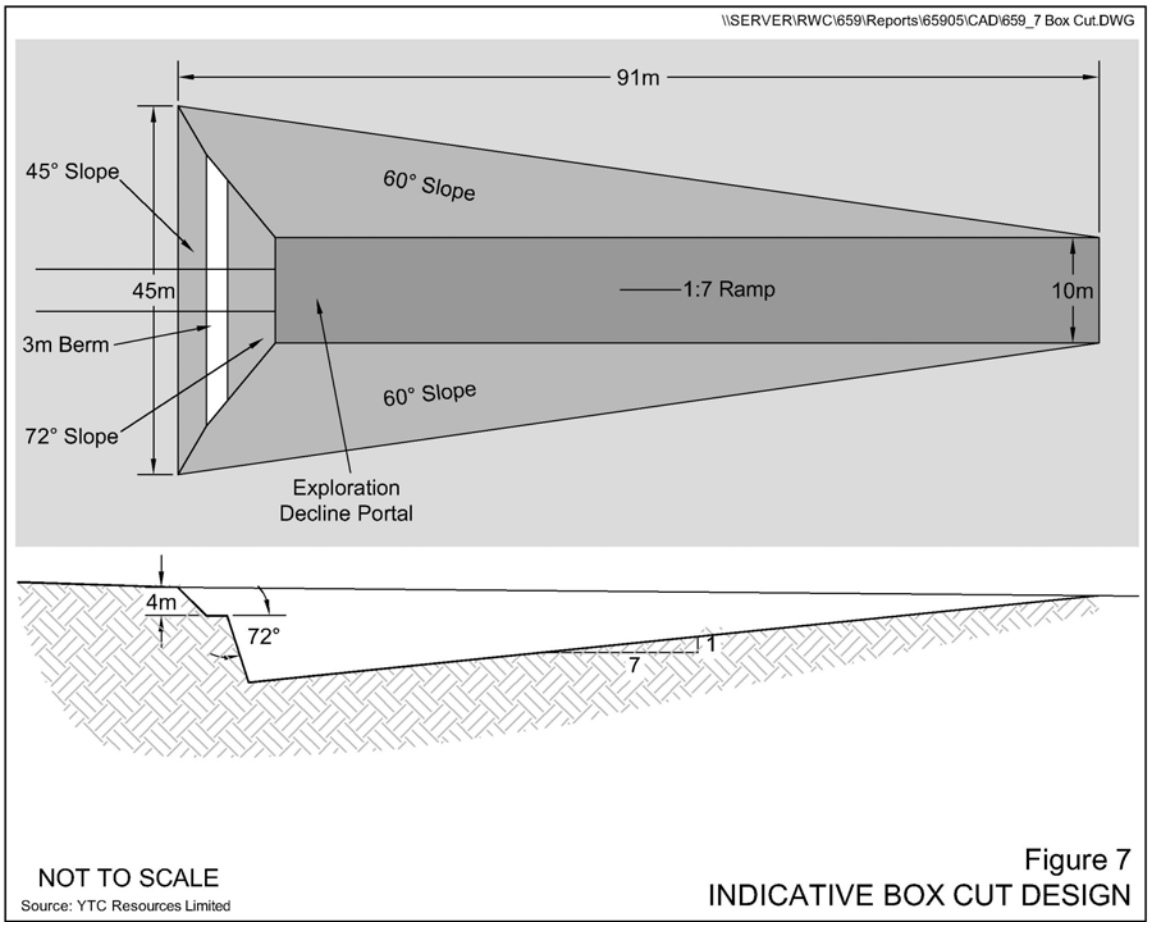


Figure 7
INDICATIVE BOX CUT DESIGN

6.4.2.3 Construction of the Box Cut

Once vegetation and soil material have been removed, as described in Section 6.3, and surface water management structures have been constructed, the box cut would be excavated using conventional load and haul methods using an excavator or front-end-loader and haul trucks. Where required, a bulldozer may be used to rip material that cannot be extracted using an excavator or front-end loader.

When the excavation has progressed to a point where material cannot be extracted using an excavator, front-end loader or bulldozer, the material would be fragmented using drill and blast techniques. This would require drilling of holes using a hydraulic drill rig, loading of those holes with either pre-packaged or bulk explosives, boosters and detonators and fragmentation of the *in situ* material. Fragmented material would be removed using load and haul techniques. Management of material removed during construction of the box cut is described in Section 6.4.3.4.

A blasting site law would be established to accurately predict blasting-related impacts at surrounding residences. All blasts would be designed, supervised and initiated by a suitably licensed and experienced blasting engineer or shot firer. Each blast would be designed to achieve the following.

- Compliance with all blasting criteria at all surrounding residences, as identified in the Environment Protection Licence for the Project.
- Suitable fragmentation.

- Preparation of suitable surfaces for the box cut walls, possibly including the use of pre-split blasting.

6.4.2.4 Formation of the Portal and the Underground Infrastructure

Once the box cut has been excavated to the required dimensions and material of suitable competency has been exposed, the walls would be stabilised using a combination of rock bolts, cable bolts and shotcrete. The portal to the decline would then be constructed. Additional roof and wall support, would be installed in the near surface sections of the decline.

Following the establishment of the portal, infrastructure required for underground mining operations would be installed. This would indicatively include the following.

- Underground power, including a transformer to convert the voltage of the distributed electricity to 1 000V, suitable for use underground.
- Temporary ventilation, including one or more vent fans located within the box cut.
- Mine water supply to provide water for underground mining operations, including the header tank.
- A surface sump to allow water pumped from underground, as well as water collected within the box cut, to be collected and removed.
- A tag board and associated surface safety equipment and infrastructure.

Development of the portal using a single heading would be required initially. However, once portal development reaches the initial extraction level, development on multiple headings may be undertaken.

6.4.3 Underground Development

6.4.3.1 Introduction

This sub-section describes the underground development that would commence once the portal has been established and the required infrastructure installed. An overview of the proposed drill, blast, load and haul operations that would be undertaken, as well as the ventilation and emergency egress infrastructure that would be established, is also presented. It is noted that construction of the decline to the initial extraction level is an approved activity.

6.4.3.2 Decline and Development Design

Figure 7 presents a plan view of the proposed decline. The decline would include the following indicative design parameters.

- Height – approximately 5.5m.
- Width – approximately 5.0m.
- Gradient – approximately 1:7 (V:H).

- Final design length – approximately 3 500m.
- Maximum depth of development – approximately 500m below the surface.

Development headings and ore drives, being those drives that would permit access from the decline to individual mining areas, would have the following indicative design parameters.

- Height – approximately 4.5m.
- Width – approximately 4.5m.

6.4.3.3 Drill and Blast Operations

The decline and development headings would be developed using conventional underground drill and blast techniques. A jumbo, or underground drill rig, would drill a pattern of holes, the spacing and length of which would be determined by the blasting engineer or shot-firer. Once drilling has been completed, these holes would be loaded with bulk or pre-packaged explosives, boosters and detonators and the *in situ* material fragmented.

Blasting would only be undertaken once the proposed mine has been evacuated, typically at meal breaks or shift change.

As noted in Section 6.4.2.3, the drill and blast operations, including drill and blast operations for underground stoping operations, would be designed in a manner that would ensure compliance with the criteria identified in the Environment Protection Licence for the Project.

6.4.3.4 Load and Haul Operations

Fragmented material would be extracted using an underground loader. If required due to stability or safety issues, the loader may be remotely operated. The loader would be used to load underground haul trucks. Alternatively, the loader may be used to transport material to a loading bay for later reclamation.

Once loaded into haul trucks, fragmented material would be transported to the temporary Waste Rock Emplacement on the surface (**Figure 6**) or used for stope for backfilling operations (see Section 6.4.4.3).

6.4.3.5 Ventilation and Emergency Egress

Initially, supply of fresh air underground would be provided using a ventilation fan located at the portal. Air would be pumped to the face of decline using air bags. Return air would flow back up the decline. As decline construction progresses, the ventilation infrastructure would be advanced to ensure adequate ventilation exists in all sections of the advancing decline.

When the decline has been advanced sufficiently, two ventilation rises would be installed to ensure the supply of fresh air underground (**Figure 5**). One ventilation rise with an associated fan with a nominal capacity of $180m^3/s$ installed on the surface, would act as an exhaust vent for return air while the decline would act as one air intake into the underground mine. The other ventilation rise would act as another air intake. That ventilation rise would be equipped as an escape way to permit emergency egress. Other mine services such as power and water may also be installed within the vent rise.

Details of the construction of the ventilation rises would be provided in the *Environmental Assessment*.

6.4.4 Underground Stoping Operations

6.4.4.1 Open-Stope Mining Method

This sub-section provides an overview of the stope design and proposed sublevel open stoping mining method that would be used for the extraction of the ore material.

Stoping is to be undertaken using conventional sublevel open stoping mining techniques.

Indicatively, 76mm blast holes would be utilised. These holes would be loaded with bulk or pre-packaged explosives, boosters and detonators and the *in situ* material fragmented as described in Section 6.4.2.3. This method recovers ore from elongate vertical stopes. Between stopes, pillars (vertical) and sills (horizontal) of unmined material are left to provide support and prevent ground collapse. Drilling results undertaken to date and an inspection of the core suggest that the mineralisation and the host rocks appear to be competent and would be able to support significant openings.

Figure 8 presents a schematic overview of the proposed mining method. The sublevel open stoping mining method entails developing an ore drive along the mineralisation to the limits of the ore where a slot rise is mined. A production drill is then used to drill rings of holes back along the ore drive. Once the slot is extracted at the end of the ore body, the rings of drill holes are progressively blasted and the stope is retreated back to the decline.

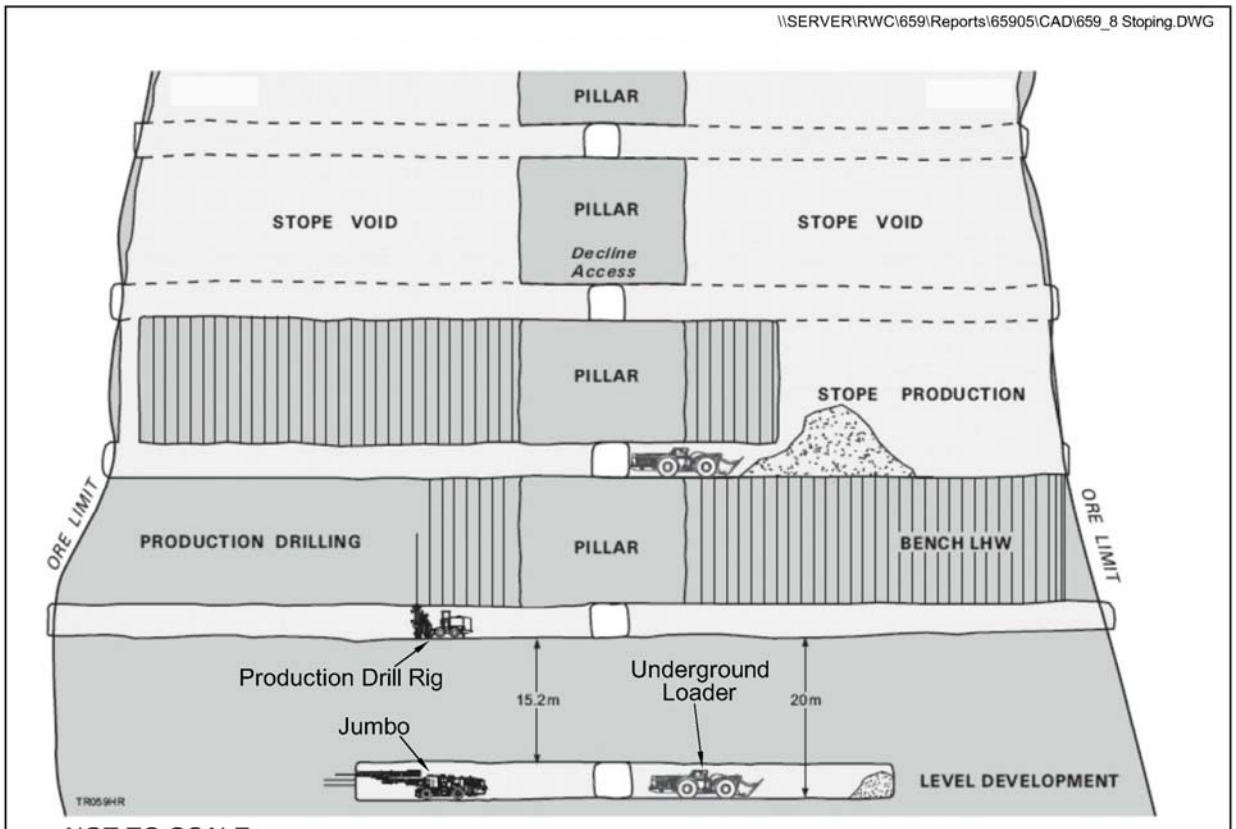


Figure 8
SCHEMATIC SUB-LEVEL OPEN STOPING MINING METHOD

Pillars would be left every approximately 30m along strike, with the final distance adjusted to ensure that the actual position of the pillar coincides with the lower grade ore. Sub-levels would be established approximately every 25 m.

Following the formation of a pillar, a new slot and rise would be formed prior to recommencing stoping. In areas where the ore thickness is greater than 5 m, the ore drive may be silled out to a maximum of 6m. Some cable support may be required where the ore drive is significantly widened. For zones of significant width, two ore drives may be developed.

Geotechnical conditions may dictate the need to backfill stopes, and this would be done following completion of mining within each stope (see Section 6.4.4.2).

6.4.4.2 Stope Backfilling Operations

Backfilling of underground stope voids with waste rock would be undertaken, to provide for local mine stability and to allow extraction of higher grade resources in localised areas. The Proponent estimates that approximately 25% of the stopes that would be created would be backfilled with waste rock, either directly or with material stockpiled temporally at the surface.

The back-filling would use waste rock material sourced preferentially from concurrent underground development, with additional waste rock material transported from the temporary Waste Rock Emplacement on the surface, if required. **Figure 9** shows a typical schematic of bench mining and stope back-filling with waste rock.

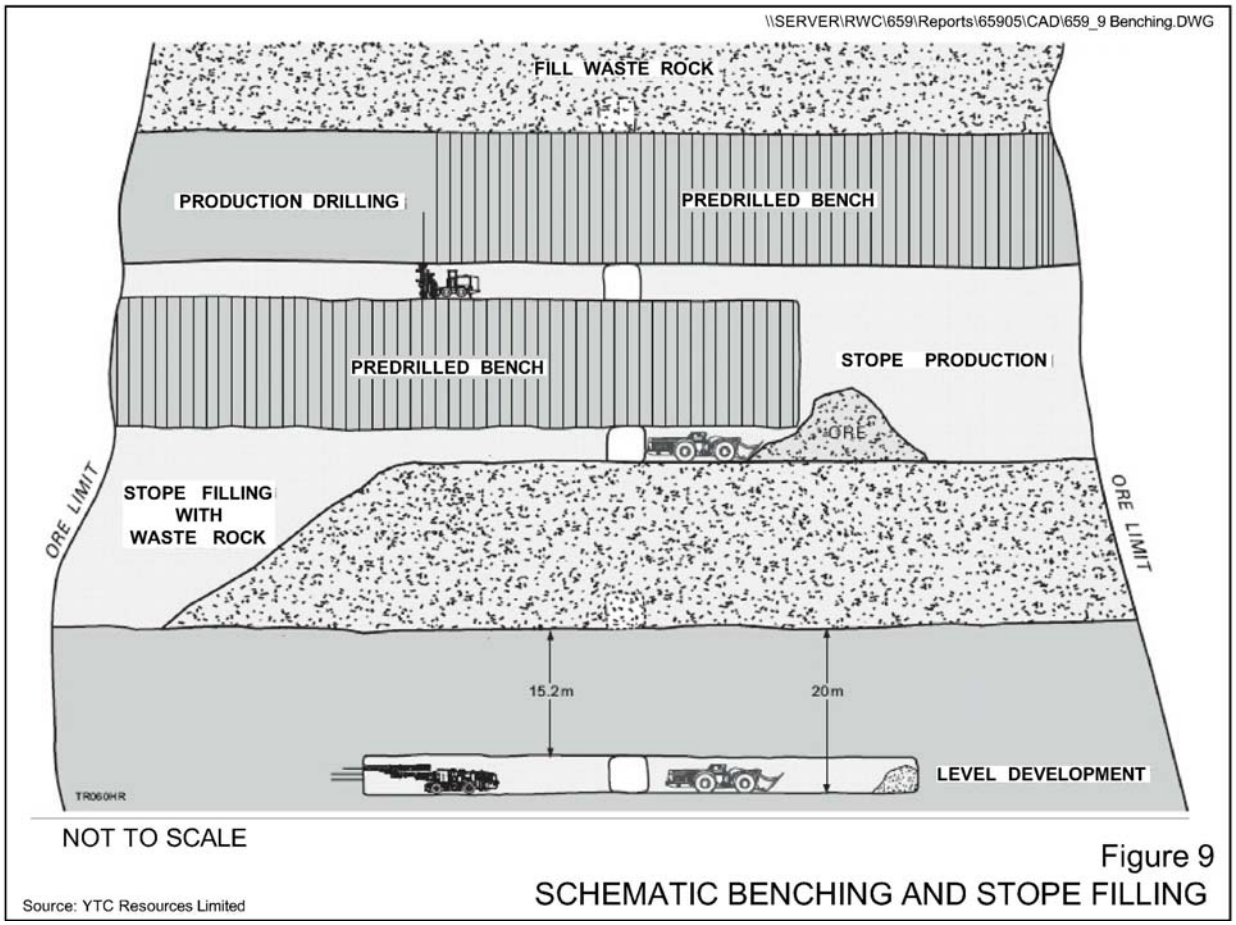


Figure 9
SCHEMATIC BENCHING AND STOPE FILLING

This back-fill material would be transported to a drive in the vicinity of the top of the stope using an underground haul truck. The material would be stockpiled in the drive and then pushed or tipped into the stope using an underground loader. During such operations, the loader may, where required, be operated remotely. Sections of some stopes may be cement stabilised.

The advantage of backfilling the stopes would be to reduce the quantity of waste rock transported to the surface, increase the geotechnical stability of the mined stopes and maximise the recovery of ore material, with resulting reduced environmental impacts and mining costs.

6.4.5 Mining Rate

The indicative maximum mining rate would be approximately 350 000t per year of run-of-mine (ROM) ore, which equates to approximately 85m vertical advance per year. The production rate would vary depending on the number of development headings and stopes available at any one time and is expected to increase progressively as the mine is developed and would decrease towards the end of the life of the Project as stopes are gradually completed.

Table 5 provides an indicative mining rate for the life of the Project. The table provides the relative amounts of the ore and the waste rock extracted making up the total extraction per annum.

Table 5
Indicative Mining Rate

Year	Tonnes		
	Ore	Waste	Total
1	0	171 000	171 000
2	235 250	126 000	361 250
3	347 750	85 250	433 000
4	351 250	81 750	433 000
5	351 500	81 500	433 000
6	349 250	38 500	387 750
7	351 250	0	351 250
Total	**1 986 250**	**584 000**	**2 570 250**
Source: YTC Resources Limited			

6.4.6 Mining Equipment

Table 6 presents the mobile mining equipment that would be required during the life of the Project. In addition, a number of light and heavy vehicles and ancillary equipment such as lighting plants and service vehicles would also be required.

Table 6
Proposed Mining Equipment

Equipment	Indicative Number Required	Hours of Operation
Box Cut Establishment		
Pneumatic drill and compressor.	1	7 am to 10 pm, 7 days per week
Excavator	1	
Haul trucks (50 tonne)	2	
Site Establishment and Surface Operations		
Front-end loader (Cat 998)	2	7 am to 10 pm, 7 days per week
Bulldozer (Cat D10)	1	
Grader (Cat 14H)	1	
Road Train and haul trucks	1 or 2	
Establishment and Underground Mining Operations		
Jumbos drill rigs	1 or 2	24 hours per day; 7 days per week
Underground Load-Haul-Dump unit (bogger)	1 or 2	
Underground Haul trucks	2	
Tool Carrier	1	
Power Generator		
Diesel Generators 800 kVA (Cummins)	4	24 hours per day; 7 days per week
Source: YTC Resources Limited		

6.5 PROCESSING OPERATIONS

6.5.1 Introduction

This sub-section provides a description of the proposed processing operations, including the layout of the Processing Plant and crushing, grinding, flotation, leaching and gold room operations.

In summary, however the Processing Plant would process mined ore material to produce gold-silver doré (unrefined gold and silver bar), a bulk copper-lead-zinc concentrate and tailings. The Processing Plant would be designed to operate at a nominal rate of approximately 50t per hour or approximately 350 000t per year.

6.5.2 Processing Plant Layout and Overview

The Processing Plant layout would reflect the sequential nature of the processing operations with a ROM pad for ore receival at one end of the facility and concentrate storage and loading facilities at the other end. The proposed layout of the Processing Plant is provided in **Figure 6**.

Processing operations would, in summary, comprise the following:

- Stockpiling of ore material on the ROM pad.
- A mobile jaw crusher located on the ROM pad would be used to reduce the ore material to less than 200mm.

- Two stage crushing and screening to reduce ore material to a nominal 80% passing 36mm.
- Grinding in a single stage ball mill to a nominal 80% passing 0.25mm.
- Gravity separation of gold using an inline pressure jig and batch centrifugal concentrators.
- Intensive cyanide leaching and electrowinning of the gravity gold-silver concentrate to produce gold-silver doré.
- Bulk flotation to produce a bulk flotation concentrate.
- Regrinding and tank cyanide leaching of the bulk flotation concentrate followed by Merrill Crowe treatment to produce gold-silver doré.
- Filtration of the tailings from the tank leach to recover cyanide and to produce a final mixed bulk lead-zinc concentrate with some gold and silver credits.
- Thickening of the flotation tailings for water recovery.

6.6 TAILINGS MANAGEMENT

6.6.1 Introduction

Ground ore material from which the metalliferous minerals have been removed (referred to as tailings), would be passed through a thickener to remove excess water from the material for re-use within the Processing Plant. The Proponent estimates that the remaining tailings slurry, which would be approximately 60% solids by weight, would be pumped into the Tailings Storage Facility (see **Figure 5**).

The Proponent anticipates that the Tailings Storage Facility would be a "prescribed" dam and would be listed in Schedule 1 of the *Dams Safety Act 1978*. As a result, the facility would be constructed in accordance with the requirements of the NSW Dams Safety Committee.

6.6.2 Tailings Storage Facility

6.6.2.1 Geotechnical Considerations, Design and Construction

The indicative design criteria for the facility are as follows.

- Maximum area of disturbance – approximately 43.8ha.
- Maximum embankment height – approximately 9m above the natural surface.
- Slope of outer face of the embankment – 1:3 (V:H).

The Proponent would adopt recommendations made by Coffey Mining Limited, who undertook a preliminary geotechnical study for the Tailings Storage Facility (Coffey (2010), in the final design of the facility. The detail specifications will be given in the *Environmental Assessment*.

6.6.2.2 Staging of Construction

Construction of the Tailings Storage Facility would be staged. The following represents the capacity that would be achieved in three stages.

- Stage 1: 473 000m^3 (nominal. 2-year capacity).
- Stage 2: 584 000m^3 (nominal 2.5-year capacity).
- Stage 3: 635 000m^3 (nominal. 2.7-year capacity).

As noted above, the construction materials, where possible, would be sourced from within the Tailings Storage Facility footprint.

6.6.3 Tailings Volume

Stages 1 to 3 of the proposed Tailings Storage Facility have a combined maximum storage capacity of approximately 1.69 million m^3 of material. The proposed Tailings Storage Facility would cater for all tailings material produced throughout the life of the Project.

6.6.4 Tailings Material Characteristics

Tailings material would comprise ground ore material with the majority of metalliferous minerals removed. Give the ore material would be ground to a nominal 80% passing 0.25mm particle size, the tailings material would be relatively coarse grained and free draining.

The chemical analyses of tailings generated from the metallurgical testing program, and the results of test work for acid forming potential of the tailings would be presented in the *Environmental Assessment.*

6.6.5 Operation of the Tailings Storage Facility

Tailings material, in the form of thickened slurry, would be pumped from the Processing Plant and discharged to the Tailings Storage Facility from a series of raised spigots or outlets along the western margin of each stage of the facility. This placement procedure allows for an appropriate tailings density to be established, ensuring the ongoing stability of the Tailings Storage Facility, as well as construction of a water shedding landform without the requirement for major earthworks at the end of the life of the Project.

6.6.6 Monitoring of the Tailings Storage Facility

The Proponent would implement a surface water management and surface water and groundwater monitoring program during the operation of the Tailings Storage Facility and until rehabilitation of the facility has been completed.

The results of that monitoring program would be presented annually in the *Annual Environmental Management Report* for the Project.

6.7 WASTE ROCK MANAGEMENT

6.7.1 Introduction

During underground development operations, material that has insufficient concentration of metals to justify processing would be removed and placed either within the temporary Waste Rock Emplacement (**Figure 5**) or used directly during stope backfilling operations (Section 6.4.4.3) or construction of site infrastructure.

This sub-section provides an overview the design of the temporary waste rock emplacement and the procedures that would be implemented during placement operations. Details in relation to the characteristics of the waste rock material would be provided in the *Environmental Assessment*.

6.7.2 Temporary Waste Rock Emplacement Design

The temporary waste rock emplacement would have the following indicative design components.

- Area – approximately 2.6ha.
- Capacity – approximately 100 000m^3.
- Maximum elevation – approximately 10m higher than the existing surface.
- Batter slope – approximately 1:4 (V:H) or 14°.

6.7.3 Waste Rock Emplacement, Processing and Reclamation Procedures

Waste rock material to be placed within the temporary waste rock emplacement would initially be ‘paddock dumped’ in layers of approximately 3m high. This material would then be levelled using a bulldozer to create a suitable level working area. Additional waste rock material would then be used to construct one or more ramps. Further waste rock material would then be ‘face dumped’ from the top of the ramp(s).

Where appropriate, waste rock material would be transported directly to other sections of the Project Site for use during infrastructure establishment, principally for construction of the tailings storage facility embankment. Placement procedures would be similar to those described for the temporary waste rock emplacement.

Waste rock material may be used during construction of other infrastructure during the life of the Project, including the site access roads, other tracks and the proposed hardstand areas. Crushing of the waste rock will be undertaken either using a mobile crushing plant located within the footprint of the temporary waste rock emplacement, or within the Processing Plant.

Waste rock material not used to establish surface infrastructure would be reclaimed and transported back underground using an excavator and / or front-end loader and underground haul trucks and used during backfilling operations.

6.7.4 Material Characteristics and Leachate Management

The Proponent notes that potential exists for some waste rock material to generate acidic leachate. As a result a detailed program of test work will be undertaken during preparation of the *Environmental Assessment* to further quantify the potential risks.

The following management and mitigation measures would be implemented to minimise impacts of potentially acid-generating leachate.

- Only material determined through test work to be non-acid generating would be used for construction of site infrastructure. All potentially acid generating material would be stockpiled on the surface temporally prior to being returned underground.
- A spoon drain would be formed around the perimeter of the temporary waste rock emplacement and all surface water runoff would be directed to the Leachate Management Pond (**Figure 5**). Water monitoring at a number of locations would be undertaken in accordance with the site's *Environmental Management Plan,* which would be used to identify any acid leachate generation for implementation of appropriate actions for the prevention of pollution of clean water.

6.7.5 Waste Rock Balance

The waste rock balance during the life of the Project is presented in **Table 7**. The Proponent anticipates that approximately 280 000m^3 of waste rock would be generated during the life of the Project. Approximately 140 000m^3 of waste rock material would be used during site establishment operations and a further 100 000m^3 of waste rock would be used during stope backfilling operations. The remaining 40 000m^3 would be used for the construction of site access roads (30 000m^3) and the Tailings Storage Facility (10 000m^3). As a result, there would be no waste rock surplus during the life of the Project and no waste rock material would remain stockpiled on the surface at the completion of mining operations.

Table 7
Waste Rock Balance

Item	Volume(m^3)	
	Source	**Sink**
Box cut, Portal and Decline	50 000	–
Laydown Area	30 000	–
Underground Operational Waste Rock	200 000	–
Site Access Roads	–	30 000
ROM Pad	–	100 000
Tailings Storage Facility	–	10 000
Stope Back-fill	–	140 000
Total	**280 000**	**280 000**
Note 1: Material used for construction of site infrastructure would be non-acid forming.		
Source: YTC Resources Limited		

6.8 NON-PRODUCTION WASTE MANAGEMENT

Non-production waste would be managed in accordance with the *Protection of the Environment Operations (Waste) Regulation 2005*. The underlying principle for all waste management would be to minimise waste generation, and to recover, re-use and to recycle waste materials as much as possible.

Estimates of the non-production wastes that would be generated per year during the life of the Project, as well as descriptions of how that waste would be stored, managed and subsequently removed from the Project Site are provided in **Table 8**.

The Proponent would ensure that all recyclable materials would, where practicable, be recycled on site or would be transported to an appropriate recycling facility.

Table 8
Non-Production Waste Management

Waste Type	Anticipated Maximum Quantity Generated/year	Storage	Removal Method
General solid waste (putrescible), including food scraps and inert materials	20t	Covered bins located within lunch rooms, offices, the camp site and elsewhere as required. Where these bins would be located in open areas, they would be fitted with animal-proof lids.	Collected on a regular basis by licensed waste contractor and transported to a licensed waste disposal facility.
Waste oils and greases	6t	Placed within bunded tank(s) within the workshop area.	Collected on a regular basis by a licensed waste contractor and transported to an appropriately licensed facility.
Batteries and tyres	40t	Batteries would be placed within a covered and marked used battery storage area until removed from site. Tyres would be placed within a marked used tyre storage area until removed from site or used for another purpose.	Batteries would be collected on a regular basis by a licensed disposal contractor and recycled. Tyres would be re-used on site for construction of retaining walls, erosion protection, traffic control or would be removed from site for re-use elsewhere or recycling.
Scrap Steel /Metal	10t	Stored in a specified areas within the workshop area or elsewhere such as the laydown area, as required.	Collected on a regular basis by a scrap metal recycler.
General Recyclables	5t	Covered bins located within lunch rooms, offices, camp site and elsewhere as required. Where these bins are located outside a closed building they would be fitted with animal-proof lids.	Collected on a regular basis by a licensed recycling contractor and transported to an appropriate recycling facility.
Waste water	5ML	Waste water from ablutions facilities within the surface facilities area would be treated within one or more 'biocycle' treatment facilities and the treated water would be used for suppression of dust in areas undergoing rehabilitation within the Project Site. Treatment of waste water within the Mine Camp is presented in Section 6.10.4.5.	
Source: YTC Resources Limited			

6.9 TRANSPORTATION

6.9.1 Project Site Transportation

6.9.1.1 Internal Road Network

The existing site entrance and the Light Vehicle Access Road are proposed to be used principally for light vehicle and light truck access to the Project Site, mainly to the Mine Camp. A sign, indicating that the existing site entrance and the Light Vehicle Access Road are only to be used by light vehicles would be erected in the vicinity of the existing intersection on Burthong Road.

The main site entrance and Main Site Access Road would be used by both light and heavy vehicles for access to all areas of the Project Site. Construction of the main site entrance and Main Site Access Road is presented in Section 6.2.3.

A range of existing internal road network (predominantly unsealed) and other roads would continue to be utilised or would be upgraded or constructed during and following site establishment. These unsealed haul roads would cater for both light and heavy vehicles while other roads would principally cater for light vehicle traffic.

6.9.1.2 Separation of Mine and Non-mine Traffic

The Proponent would ensure adequate separation of all mine and non-mine traffic through the use of measures including a security gate and fencing in the vicinity of the Proponent's site office. Access to active sections of the Project Site would be restricted to approved vehicles and drivers.

6.9.2 External Transportation

6.9.2.1 External Road Network

The Proponent anticipates that there would be three principal transportation routes to access the Project Site as follows.

i) From the northwest, or southwest via Kidman Way, Priory Tank Road and Burthong Road.

ii) From the southeast via Nymagee-Condobolin Road, Milford Street, Harwood Street and Burthong Road.

iii) From the northeast via the Barrier Highway, Hermidale – Nymagee Road, Milford Street, Harwood Street and Burthong Road.

In addition, the Proponent notes that limited numbers of local traffic may approach the Project Site from the south via Burthong Road.

The Proponent anticipates that 90% of light vehicles and all heavy vehicles accessing the Project Site would do so from the north and west via Kidman Way, Priory Tank Road and Burthong Road. The Proponent would actively discourage any heavy vehicles from using other roads, through contractual arrangements and a Driver's Code of Conduct.

Finally, the Proponent would require that all persons accessing the Project Site to comply with restrictions on use of the Hermidale – Nymagee Road imposed by Cobar Shire Council.

6.9.3 Product Transportation Routes

The Proponent notes that there are a range of potential final destinations for the bulk concentrate. These may include the following.

- Endeavour Mine via the Kidman Way.
- Hermidale Siding via the Barrier Highway for transfer to trains and transportation to domestic customers or parts for export to international customers.

In the event that rail transportation is not practicable for reasons of congestion or absence of rail unloading facilities at the destination, the bulk concentrate would be transported via the State Highway network.

An assessment of the proposed heavy vehicle route will be provided in the *Environmental Assessment*.

6.9.4 Traffic Types and Levels

Traffic types associated with the Project would include the following.

- Light vehicles – including passenger vehicles and light trucks and buses. It is noted that limited numbers of light vehicles would be required to transport Project-related employees because the majority would be accommodated within the Mine Camp.
- Heavy vehicles – including rigid trucks, semi-trailers and B-Doubles delivering consumables and supplies to the Project Site and transporting concentrate to the Proponent's customers.
- Oversize and overweight vehicles – delivering components of the Processing Plant and mobile fleet, primarily during construction operations. The Proponent would ensure that all oversize and overweight vehicles would have the appropriate permits and approvals and would be appropriately escorted, when required.

Table 9 presents the anticipated vehicle movements during the construction and operation stages of the Project.

Table 9
Anticipated Vehicle Movements

Vehicle Type	Anticipated 85th Percentile Daily Movements[1]
Construction Phase	
Light Vehicles	40
Heavy Vehicles[2]	10
Oversize/Overweight Vehicles[3]	2
Operational Phase	
Light Vehicles	30
Heavy Vehicles[2]	6
Oversize/Overweight Vehicles[3]	nil

Note 1: One return trip = two movements
Note 2: Includes semi-trailers and B-Double trucks and road trains
Note 3: The Proponent would ensure that oversize and overweight vehicles would have the appropriate permits and approvals and would be appropriately escorted, when required

6.10 MINE CAMP ESTABLISHMENT AND OPERATION

6.10.1 Introduction

This sub-section provides an overview of the establishment and operation of the Mine Camp that would accommodate the Proponent's employees and contractors during the site establishment and operational phases of the Project. All components of the Mine Camp will be demountable and transportable structures that will be removed from the Project Site on completion of the Project.

The Proponent proposes to provide on-site accommodation for Project-related personnel on a drive-in/drive-out basis. It is anticipated that these personnel would work on a two weeks on and one week off roster, or similar.

6.10.2 Accommodation Facilities

The Mine Camp would have a total capacity to accommodate approximately 72 persons comprising 60 full-time mine personnel, plus an overflow accommodation provision for 12 persons. The accommodation has been designed around a central open space area. A layout for the Mine Camp is presented in **Figure 10** and may be summarised as follows.

- Twenty four two-bed cabins for fulltime mine personnel and three four-bed overflow cabins that would provide temporary accommodation to visitors, contractors etc.
- A water treatment facility such as a reverse osmosis plant for treatment of groundwater for use as potable water.
- Ablutions facilities within each cabin serviced by appropriately sized rainwater tanks and a communal biocycle or similar waste water management system.
- A Mess Hall containing a commercial kitchen and dining area.
- A Communal Room and outside grassed area for recreation.

- Additional toilet facilities in the vicinity of the Mess Hall and the Communal Room.
- Facilities for laundering (both personal and communal).
- A communal car park.

Wherever practicable vegetation will be retained during construction of the Mine Camp to provide shade to the cabins and other buildings within the Mine Camp, and generally afford a scenic character overall to the Mine Camp.

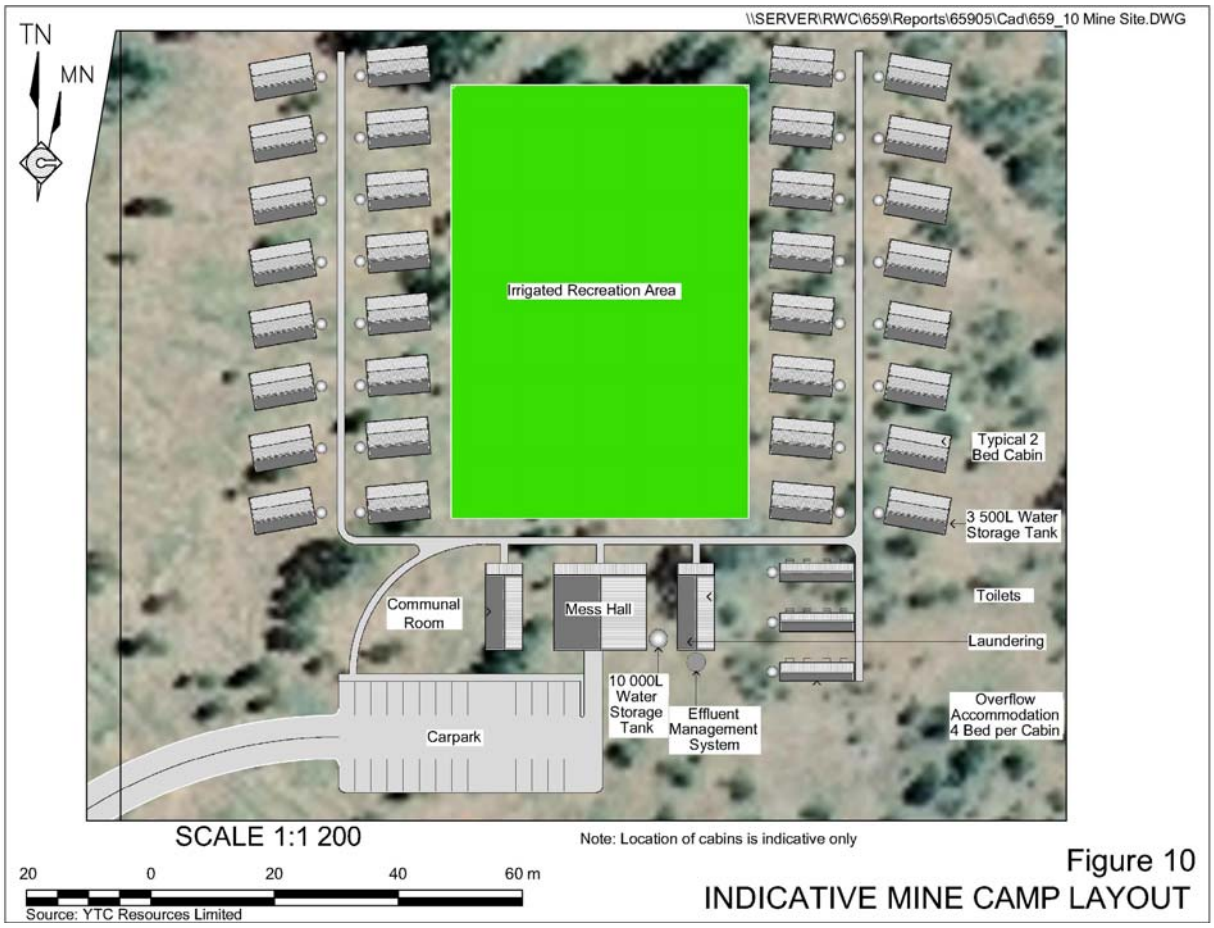


Figure 10
INDICATIVE MINE CAMP LAYOUT

6.10.3 Mine Camp Site Access and Personnel Transportation

Access to the Mine Camp site would be via the Light Vehicle Access Road and the Mine Camp Access Road (see **Figure 5**).

It is envisaged that approximately half of the mine personnel that would be accommodated within the Mine Camp would use their own private vehicles to access the Project Site at the start and finish of each rotation, with the remaining using the minibus service that would be organised by the Proponent between the Project Site and Cobar.

6.10.4 Mine Camp Services

6.10.4.1 Electricity

A dedicated diesel generator with a nominal capacity of 220kVA would be installed in the vicinity of the Mine Camp to supply power to the entire Mine Camp for lighting, heating and cooling.

6.10.4.2 Gas

LPG gas would be used for cooking within the Mess Hall. LPG cylinders would be located in the vicinity of the Mess Hall and would be transported to the Project Site as required.

6.10.4.3 Potable Water

The Proponent estimates that total potable water requirements for the Mine Camp would be as follows.

- Approximately 0.63ML/year for use in the kitchen.
- Approximately 55kL/year per person for ablutions, washing and other personal use. This would equate to an annual use of approximately 4ML/year should the Mine Camp be fully occupied for the entire year.

This water would be obtained from rainwater tanks and treated groundwater.

6.10.4.4 Communications

Communications within the Mine Camp and between the Mine Camp areas outside the Project Site would be via mobile phones and land lines.

6.10.4.5 Waste Water

It is estimated that the Mine Camp would generate up to approximately 4.6ML of waste water per year. An onsite aerated wastewater treatment system would be installed within the Mine Camp. The resulting treated water would be used to irrigate the central grassed recreation area.

6.10.4.6 Solid Waste

Solid waste generated within the Mine Camp would comprise the following.

- Putrescible waste, namely food waste and screenings from the sewage treatment plant;
- Non-putrescible waste, namely paper or cardboard, glass, rubber, etc.

This material would be collected as required by a suitably licenced contractor and transported to a suitably licenced facility in Cobar. Recyclable material would be recycled where suitable facilities exist in Cobar to accept that material.

6.10.4.7 Fire Safeguards

Fire protection Mine Camp would comprise fire alarms, hydrants and fire extinguishers and that sprinklers and other fire fighting infrastructure would net be required.

6.11 FACILITIES AND SERVICES

6.11.1 Facilities

The Proponent would establish the following facilities within the Project Site.

- Proponent's site office and car park.
- Contractors Office, Laydown area and workshop.
- Reagent Store, plant workshop, ablutions facilities, crib room, hardstand and laydown areas.
- A concentrate storage shed.
- An Explosives Magazine.

These facilities are described in detail in the *Environmental Assessment*.

6.11.2 Services

Services that the Proponent would establish a range of services within the Project Site to support the proposed mining and processing operations. These would include the following.

- Electricity distribution network.
- Communications infrastructure.
- Hydrocarbon storage infrastructure.
- Potable and operational water infrastructure.

These services are described in more detail in the *Environmental Assessment*.

6.12 PROJECT LIFE AND HOURS OF OPERATION

6.12.1 Project Life

The Proponent anticipates that mining operations would require approximately five years to complete. However, in the event that the proposed rate of mining is lower than anticipated or more ore material is identified through successful ongoing exploration, additional time may be required. Following completion of mining operations, site decommissioning and rehabilitation operations may take up to two years. As a result, the proposed Project life would be nine years.

The Proponent, however, notes that throughout the life of the Project, the Company would continue to explore for possible extensions to the known mineralisation and for new areas of mineralisation within its mineral authorities. Further, ore reserves indicated in this Project may extend the Project life, in which case separate applications for approval to extract that material would be made at that time.

6.12.2 Hours of Operation

The proposed hours of operation for each of the relevant components of the Project are given in **Table 10**.

Table 10
Proposed Hours of Operation

Activity	Proposed Days of Operation	Proposed Hours of Operation[1]
Vegetation clearing and topsoil stripping	7 days a week, during each campaign	7:00 am to 6.00 pm
Construction operations – Box cut	7 days a week	7:00 am to 6.00 pm
Construction operations – Remainder	7 days a week	24 hours per day
Underground mining operations	7 days a week	24 hours per day
Maintenance operations	7 days a week	24 hours per day
Processing operations	7 days a week	24 hours per day
Transportation operations	7 days a week	7:00 am to 10.00 pm
Rehabilitation operations	7 days a week	7:00 am to 6.00 pm
Source: YTC Resources Limited		

6.13 EMPLOYMENT, CAPITAL COST AND ECONOMIC CONTRIBUTIONS

The Proponent estimates that the Project would make the following employment and economic contributions to the surrounding communities.

- Approximately 100 full-time equivalent positions during the construction phase of the Project. It is noted that with the proposed drive-in/drive-out roster, that not all employees or contractors would be on site at the same time.
- Up to approximately 100 full-time equivalent positions during the operational phase. This would be divided between employees of the Proponent (approximately 40 full-time equivalent) and approximately 60 mining personnel.
- The capital cost of the Project is anticipated to be approximately $80 million.
- The Project would contribute approximately $15 million per year to the local and regional economy through wages and purchases of local goods and services.
- The Project would contribute approximately $25 million per year to the State and national economy through purchases of goods and services within NSW and Australia.

- The Project would contribute approximately $3 million per year to the local, State and national governments through the payment of rates, taxes and royalties.

6.14 SAFETY AND SECURITY

6.14.1 Public and Employee Safety

The Proponent recognises the proximity of the Project Site to the township of Nymagee and accordingly would implement procedures and controls to protect the safety of the public. Additionally, measures would be implemented at all times to ensure the safety of visitors, contractors and employees present at the Project Site. Unauthorised access to facilities and equipment would be in force at all times.

It is the Proponent's policy that each person employed on, or visiting the Project Site would be provided with a safe and healthy working environment. To achieve this, the Proponent would implement a recruitment, induction and training program to achieve the relevant objectives.

6.14.2 Explosive Storage

Detonators, boosters and packaged explosives would be stored within magazines within the explosives storage area. This area has not been shown in **Figure 5** at the request of Department of Planning and Infrastructure. The magazine area would be secured in accordance with the relevant statutory requirements, and it would be the subject of regular inspection by security personnel working for, or contracted by the Proponent. The magazines would likely be transportable structures, which would be constructed, secured, maintained and permitted in accordance with the relevant guidelines.

6.15 SITE REHABILITATION AND DECOMISSIONING

6.15.1 Introduction

The Proponent would adopt a progressive approach to the rehabilitation of disturbed areas within the Project Site to ensure that, where practicable, areas where mining–related operations have been completed are quickly shaped and vegetated to provide a stable final landform. The progressive formation of the post-mining landform and the establishment of a vegetative cover would also minimise the potential Project-related visual amenity and air quality impacts.

The following sub-sections describe the Proponent's rehabilitation objectives and the proposed final landform on completion of all proposed mining and associated disturbance. The procedures to be applied to each component of the mine, the water management structures and other areas of disturbance associated with the mining activities are also outlined. Refinements to these procedures, if required, would be undertaken on the basis of operational experience gained by the Proponent, or by others at similar operations. These refinements would be reported in the relevant Annual Environmental Management Report and/or any amended Mining Operations Plans produced by the Proponent throughout the life of the Project.

6.15.2 Rehabilitation Objectives

The Proponent's rehabilitation objectives for all areas of mine-related disturbance within the Project Site can be defined in the short term and long term as follows.

Short Term Objectives

- Stabilise all disturbed areas no longer required for Project-related activities. This would help minimise erosion and dust generation, as well as reducing the visual impact of the proposed operation upon surrounding residents. This objective would be achieved through progressive reshaping, spreading of topsoil and seeding of the amenity bunds and waste rock emplacements and other areas of disturbance.
- Reduce the visual impact upon surrounding residents by early establishment of vegetation in areas where mining-related operations have been completed or in other areas of the Project Site.

Long Term Objective

- Provide a low maintenance, geotechnically stable and safe landform which blends with surrounding landforms and provides land suitable for the final land use of nature conservation, agriculture or light industry.

6.15.3 Final Landform and Land Use

Further details of the final landform, land use and related information would be provided in the *Environmental Assessment*. In summary, however, the final landform would include the following components.

- A bunded and fenced box cut with the portal permanently sealed in a manner that it may be re-opened in the event that mining operations re-commence in the future.
- An appropriately sealed ventilation rise.
- An appropriately shaped and covered, free draining tailings storage facility with appropriate surface water management structures and side slopes of approximately 1:3 (V:H) or less.
- A shaped, covered and vegetated processing plant and office area with all infrastructure removed.

The water management structures and dams would remain in place following completion of mining operations.

Final land uses would be determined in consultation with surrounding residents and the relevant government agencies. It is likely, however, that sections of the Project Site would be revegetated and used for nature conservation or agriculture.

6.15.4 Decommissioning of Infrastructure and Services

Following completion of mining-related operations, and assuming that no further mining operations are proposed, the Proponent would remove infrastructure and services specifically established to service the mining operation. This would include the Processing Plant and associated infrastructure.

A select number of items of infrastructure may remain provided that a subsequent use for them can be identified. Indicatively, this may include the following.

- Site buildings, including the office and workshops.
- Site access roads.
- Surface water management structures.

In summary, areas to be decommissioned would be rehabilitated as follows.

- All infrastructure, including buildings, concrete pads and hardstand areas not required for any subsequent land use would be removed.
- Where relevant, potentially hydrocarbon or salt contaminated areas would be tested and any contaminated material removed and appropriately treated.
- Disturbed areas would be ripped and where required, stockpiles soil materials would be replaced. Soil placement procedures will be further identified in the *Environmental Assessment*.
- Seed of appropriate species would be spread and the area to be revegetated would be track rolled. The advice of a suitably experienced ecologist of rehabilitation specialist would be sought to identify the most appropriate species and revegetation techniques. In summary, however, species selected would be endemic to the area surrounding the Project Site and, where possible, seed would be collected within the Project Site.
- Stockpiled vegetation removed during clearing operations would be spread over the area to be revegetated.

6.15.5 Box Cut, Portal and Ventilation Rises

The portal would be backfilled with waste rock to block the entry and the box cut and haul road would be bunded (0.5m high bund) and fenced with a 1.8m high security fence.

All surface infrastructure associated with the ventilation rises would be removed and the rises would be covered with a concrete slab.

6.15.6 Waste Rock Emplacement Footprint

The Proponent anticipates that all waste rock material would be either used during construction of infrastructure within the Project Site or transported back underground and used during stope backfilling operations. As sections of the waste rock emplacement are completed the footprint would be progressively rehabilitated.

6.15.7 Tailings Storage Facility

The tailings storage facility would, following completion of mining-related operations, be allowed to dry out and settle. Once complete, the facility would be shaped to form a free draining landform, capped with suitable material, revegetated and appropriate surface water control structures installed. Additional details of the design of the final landform for the rehabilitated Tailings Storage Facility would be included in the *Environmental Assessment.*

6.15.8 Other Areas of Disturbance

On completion of all mining-related and associated activities, the Proponent would remove and rip all remaining internal roads tracks, with the exception of the site roads, spread subsoil and revegetate the areas.

6.15.9 Rehabilitation Management and Monitoring

The Proponent's commitment to effective rehabilitation would involve an ongoing monitoring and maintenance program following completion of mining-related operations. Areas being rehabilitated would be regularly inspected.

No time limit has been placed on post-mining rehabilitation monitoring and maintenance. Rather, maintenance would continue until such time as the objectives outlined in Section **5.16.2** are achieved to the satisfaction of the relevant government agencies.

6.15.10 Biodiversity Offset Strategy

The Proponent proposes to adopt a Biodiversity Offset Strategy that focuses on the provision of an appropriately-sized offset of 'like-for-like' or 'no net loss of vegetation' corresponding to Tier 2 of the Biobanking Assessment Methodology.

The Proponent proposes to set aside approximately 200ha of land to compensate for loss of habitat through clearing of approximately 68ha of vegetation communities. The proposed 200ha offset area corresponds to a ratio of approximately 3:1, i.e. the Proponent is proposing to set aside in perpetuity approximately three times the area of land that would be disturbed in the Project. This proposal and the management of that Biodiversity Offset Area through a *Property Vegetation Plan* would more than adequately compensate for the loss of habitat within the Project Site for Project-related disturbance.

The 200ha Biodiversity Offset Area would be located within "The Peak" property but outside of the Project Site on the eastern section of the property. The exact location would be confirmed following a formal quantification using the Biobanking Assessment Methodology in conjunction with the field surveys for vegetation mapping of the proposed areas. This process would be undertaken following submission of the *Environmental Assessment* and Minister's determination.

The *Environmental Assessment* will present an assessment of the Project's Biodiversity Offset Strategy and will describe in detail how the proposed strategy would consistent with the relevant policies.

7. ENVIRONMENTAL SETTING AND CONSTRAINTS

7.1 BACKGROUND

7.1.1 Introduction

The following sub-sections provide descriptions of the environmental setting of the Project and the Project Site.

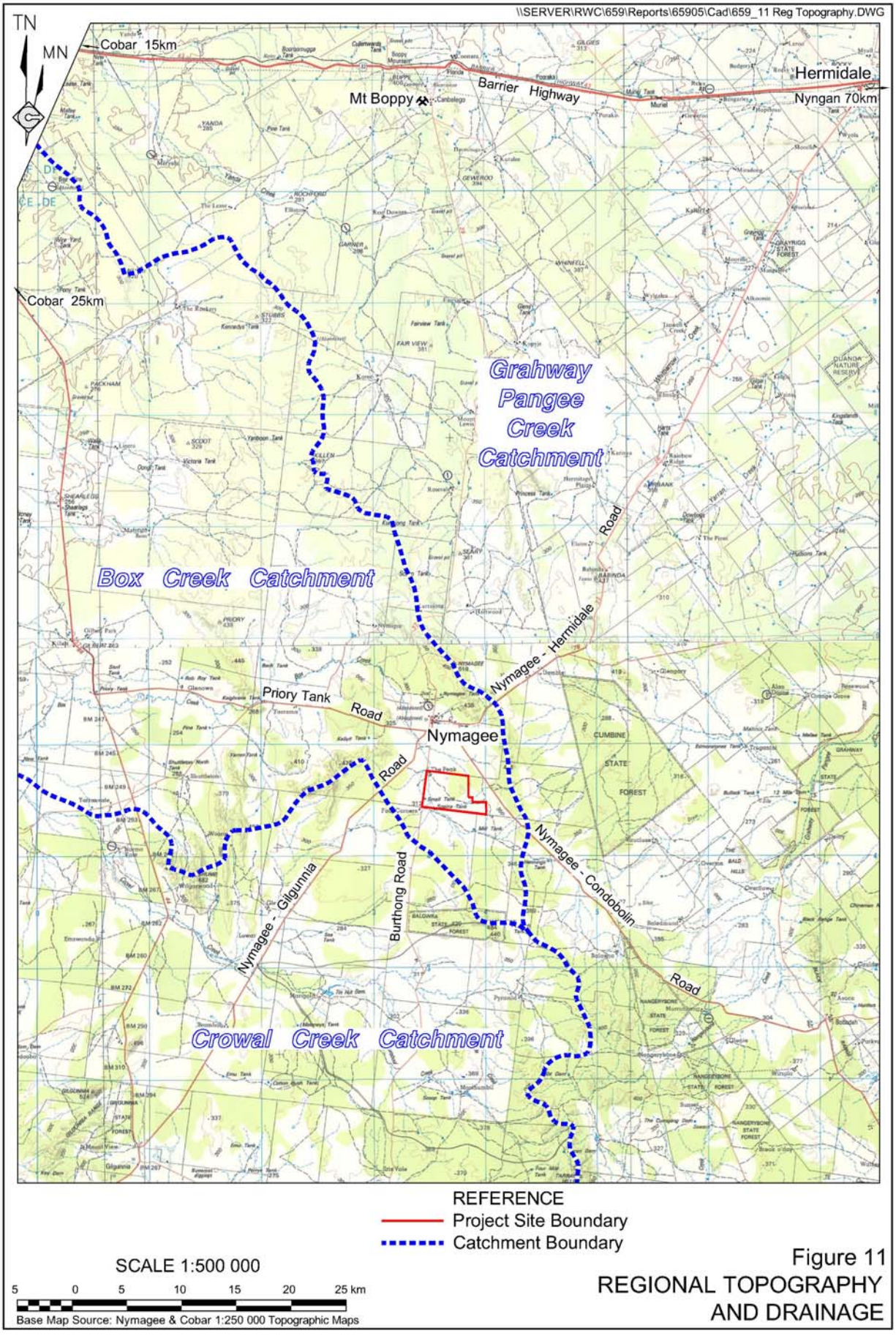
7.1.2 Topography and Drainage

7.1.2.1 Regional Topography and Drainage

The Project Site is located in an area of typically flat to gently undulating topography with elevations typically between 325m AHD and 375m AHD (**Figure 11**). Elevations become generally lower to the north and northwest, with elevations in the vicinity of Cobar, located approximately 70km to the northwest of the Project Site, approximately 100m to 150m lower than in the vicinity of the Project Site. Isolated, steep sided hills occur surrounding the Project Site, including the following.

- Mount Shume (482m AHD) located approximately 23km to the west-southwest of the Project Site.
- Mount Priory (438m AHD) located approximately 17km to the northwest of the Project Site.
- Mount Nymagee (519m AHD) located approximately 10km to the north of the Project Site.
- Mount Babinda (437m AHD) located approximately 22km to the northwest of the Project Site.
- Mount Hathaway (484m AHD) located approximately 10km to the south-southeast of the Project Site.

Surface water drainages in the vicinity of the Project Site are uniformly ephemeral and typically indistinct (**Figure 11**). The Project Site is located in the headwaters of the Box Creek Catchment which flows generally to the west and northwest. Immediately to the east of the Project Site, surface waters within the Grahway Pangee Creek Catchment typically flow to the northeast while immediately to the south of the Project Site surface waters within the Crowal Creek Catchment typically flow to the west. All catchments are part of the Barwon Darling and Far Western Catchments. It is likely that most surface water in the vicinity of the Project Site evaporates or infiltrates locally and does not leave the Box Creek Catchment.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Hermidale
Nyngan 70km
Cobar 25km
Grahway Pangee Creek Catchment
Box Creek Catchment
Crowal Creek Catchment
Priory Tank Road
Nymagee
Nymagee - Hermidale Road
Nymagee - Condobolin Road
Nymagee - Gilgunnia Road
Burthong Road
REFERENCE
Project Site Boundary
Catchment Boundary
SCALE 1:500 000
5 0 5 10 15 20 25 km
Base Map Source: Nymagee & Cobar 1:250 000 Topographic Maps
Figure 11
REGIONAL TOPOGRAPHY AND DRAINAGE

7.1.2.2 Local Topography and Drainage

The Area immediately surrounding the Project Site is typically flat to gently undulating, with elevations ranging from approximately 300m AHD to 380m AHD (**Figure 12**). A number of small hills with a maximum elevation of more than 400m AHD occur to the north, northwest, south and northeast at distances of between 4km and 10km from the Project Site. Slopes on the flanks of the small hills may be as steep as 1:10 (V:H).

7.1.2.3 Project Site Topography and Drainage

The western, southwestern and southeastern sections of the Project Site are typically flat to gently west-sloping, with slopes of 1:80 (V:H) or less (**Figure 13)**. The central section of the Project Site is dominated by a series of five hills with maximum elevations from south to north of approximately 468m AHD, 363m AHD, 358m AHD, 375m AHD and 355m AHD. Maximum slopes on these hills are as high as 1:2 (V:H). The northwestern most of these hills is referred to as the Peak, after which the "The Peak" property was named.

The northeastern section of the Project Site is typically northeast to northwest sloping, with average slopes ranging from 1:20 to 1:80 (V:H). Two small hills with maximum elevation of approximately 348m AHD are located in the northeastern section of the Project Site.

The Project Site is traversed by three unnamed creeks, referred to for the purposes of this document as Watercourses A, B and C (**Figure 13**). Watercourse A enters the southwestern section of the Project Site and joins Watercourse B. Watercourse B drains most of the Project Site and flows east to west through the existing Back Tank West. Watercourse C enters the southwestern section of the Project Site and flows into Pete's Tank.

Two catchments exist within the Project Site, referred to as Catchments A and B. Catchment A embraces the majority of the Project Site while Catchment B covers the northeast section of the Project Site boundary. Catchment C occupies the northeastern-most section of "The Peak" property. All three catchments form sub-catchments within the Box Creek Catchment.

7.1.3 Climate

7.1.3.1 Introduction

An overview of the climatic conditions surrounding the Project Site, focusing particularly on those aspects of the climate that are likely to influence the potential Project-related environmental impacts is provided in this sub-section. These conditions comprise temperature and humidity, rainfall and evaporation.

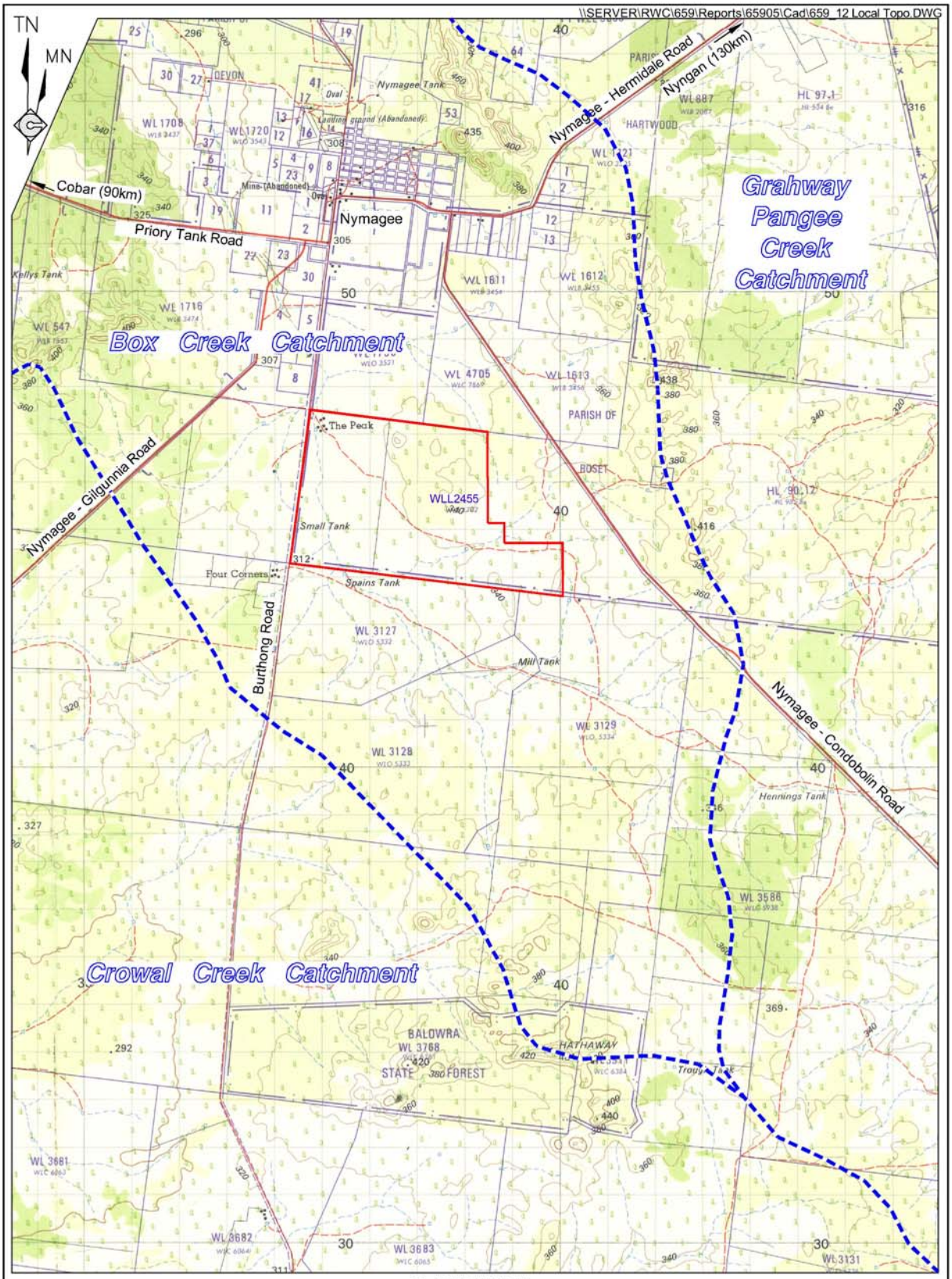
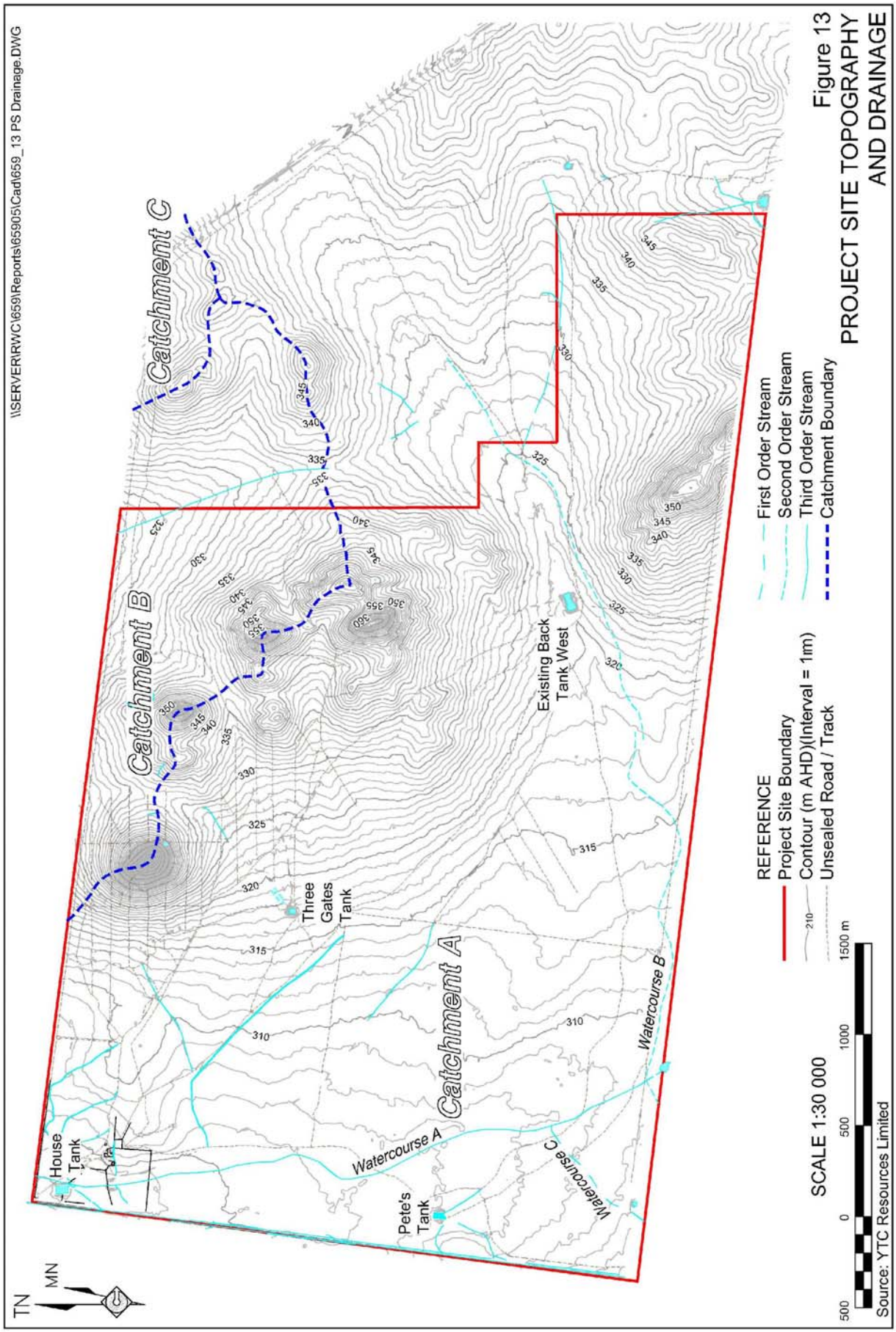


Figure 12
LOCAL TOPOGRAPHY AND DRAINAGE


\\SERVER\RWC\659\Reports\659O5\Cad\659_13 PS Drainage.DWG
Figure 13
PROJECT SITE TOPOGRAPHY AND DRAINAGE
Catchment C
Catchment B
Catchment A
Existing Back Tank West
Three Gates Tank
House Tank
Pete's Tank
Watercourse A
Watercourse B
Watercourse C
REFERENCE
Project Site Boundary
Contour (m AHD)(Interval = 1m)
Unsealed Road / Track
First Order Stream
Second Order Stream
Third Order Stream
Catchment Boundary
SCALE 1:30 000
500 0 500 1000 1500 m
Source: YTC Resources Limited
TN
MN

7.1.3.2 Data Sources

Meteorological data sourced from the following Bureau of Meteorology stations was used in the calculations of monthly averages of climatic parameters presented in **Table 11**.

- Cobar MO NSW – Open station (1962 – present).
- Cobar Post Office NSW – Closed (1881 – 1965).

These meteorological stations are located approximately 90km to the northwest of the Project Site. Data from both stations were combined to obtain average temperature and rainfall data for the period 1881 to 2009.

7.1.3.3 Temperature and Humidity

January is the hottest month, with a maximum mean temperature of 35°C. July is the coldest month with a mean maximum temperature of 16°C and a minimum temperature of 4°C.

Table 11
Climate Data

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Temperature (°C)													
Mean maximum temperature	35	34	31	26	20	17	16	18	22	27	30	33	
Mean minimum temperature	20	19	17	12	8	6	4	6	9	12	16	18	
Rainfall (mm)													
Mean rainfall	38.6	39.1	32.0	26.2	30.1	29.6	25.7	28.5	23.6	32.2	31.5	35.8	373
Highest rainfall	239.6	281.2	238.1	201.4	144	103.6	102.4	114.4	104.6	130.5	157.1	157.8	799.7
Lowest rainfall	1.4	0	0	0	0	0.3	0.2	0	0	0	0.4	1.4	116.3
Highest daily rainfall	113.3	89.7	114.3	71.4	59.4	43.4	44.6	56.9	44.4	52.6	56.6	78.7	114.3
Evaporation (1975 to 2010)													
Mean Daily Evaporation	11.5	10	8.2	5.3	3.1	2.1	2.3	3.4	5.4	7.4	9.5	11.2	6.6
Note Temperature and rainfall data were sourced from Cobar MO station for the months of May 1962 – December 2009, and from the Cobar Post Office station for the months of February 1881 – December 1965													
Source: Bureau of Meteorology Stations – Cobar MO NSW (Station No.: 0428027) & Cobar Post Office (Station No. 0428237)													

7.1.3.4 Rainfall and Evaporation

Mean annual rainfall is 373mm, with rainfall distributed reasonably evenly throughout the year, the mean monthly rainfall in the range 23.6mm to 39.1mm. It is noted, however, that rainfall is extremely variable, with infrequent, high intensity rainfall events. It is noted that the maximum daily rainfall values are between 2 and 3.5 times average monthly rainfall values.

The driest year on record was 1982 when 116.3mm of rain was recorded. By contrast, the wettest year on record was 1891 when 799.7mm of rain was recorded.

Mean daily evaporation varies through the year, from 11.5mm/day in January to 2.1mm/day in June. Annual average evaporation is 2 409mm/year.

7.1.3.5 Wind and Atmospheric Stability

Information in relation to the wind and atmospheric stability environment surrounding the Project Site will be provided in detail in the *Environmental Assessment*. In summary, during summer and autumn, east to south-southwest airflow prevails, with a significantly lower incidence of westerly winds, particularly in summer. With the onset of winter, southwest to northeast winds become increasingly prevalent. Spring shows an increase in southerly and easterly airflow is dominated by westerly and west-northwesterly winds. The strongest winds typically occur from the northerly quadrant.

7.1.4 Surrounding Land Ownership, Residences and Land Use

7.1.4.1 Land Ownership and Residences

Figure 14 presents the land ownership and residences surrounding the Project Site.

7.1.4.2 Land Use

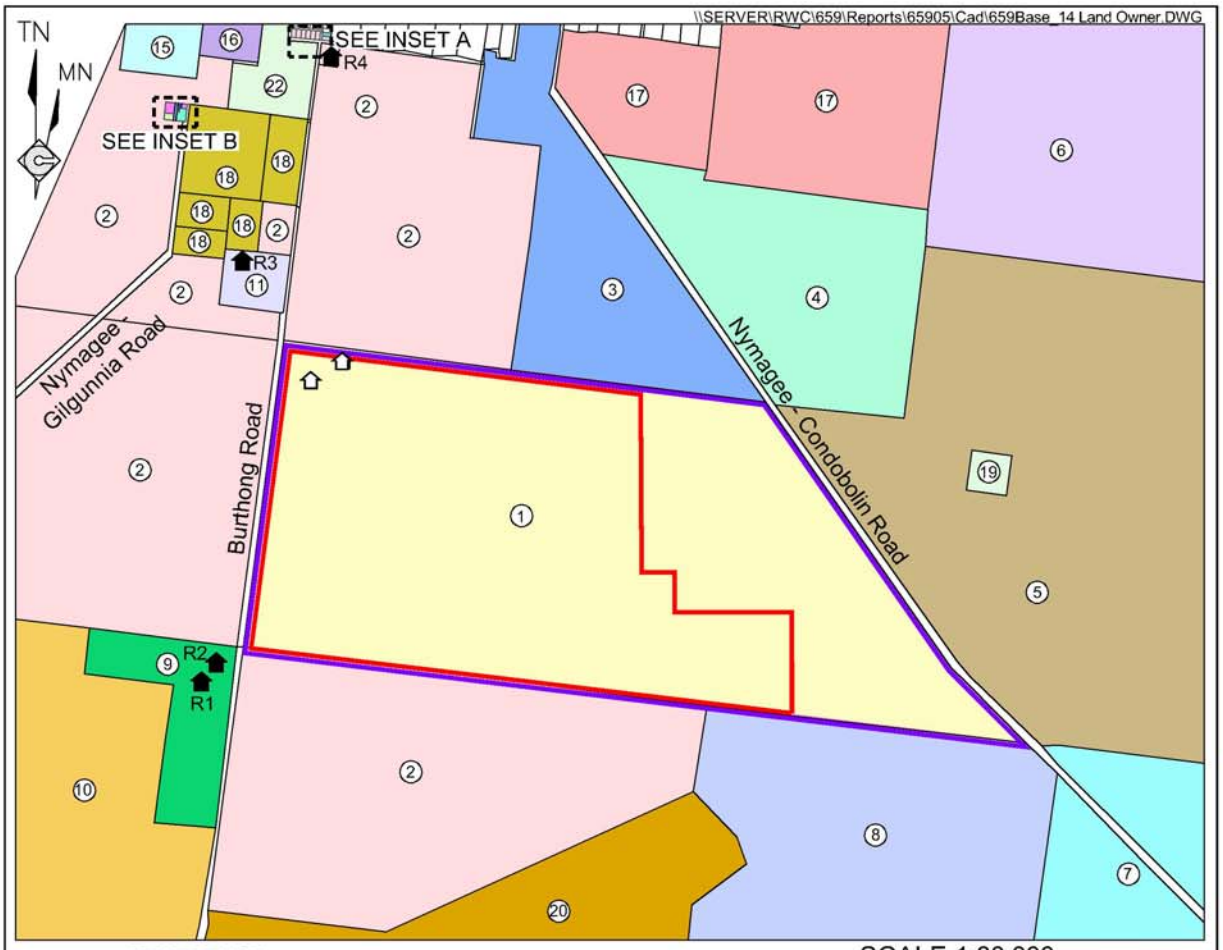
Land uses surrounding the Project Site include the following (**Figure 15**).

- Agriculture – principally grazing of sheep. Agricultural activities are principally undertaken in cleared areas on undulating hills.
- Nature conservation and forestry – these land uses are principally restricted to areas of steeper slopes and areas unsuitable for other land uses.
- Residential and rural residential – The township of Nymagee, located approximately 4 km north of Project Site, and surrounding areas include areas of rural residential and residential land use.
- Mineral exploration and mining – Section of the Project Site have been the subject of historic mining operations and more recent mineral exploration activities. Copper mining at the Nymagee Copper Mine (1881 – 1917) was undertaken 4.5km north of the Project Site.

7.1.5 Surrounding Community

7.1.5.1 Introduction

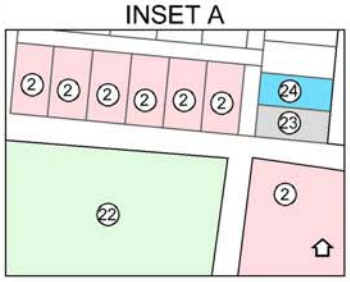
Information presented in the following sub-sections has been obtained from census data produced by the Australian Bureau of Statistics from the 2006 Census. The data relate to the census statistical area of Nymagee State Suburb (Nymagee), Cobar Local Government Area (LGA) and the NSW as a whole (NSW) (**Figure 16**).



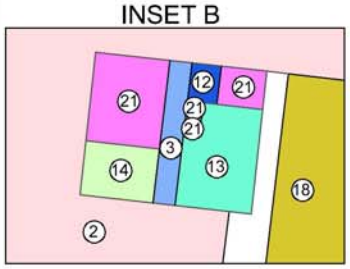
REFERENCE
"The Peak" Property Boundary
Project Site Boundary
Cadastral Boundary
① Land Owner Reference
Residence (Project-related)
Residence (Non Project-related)

SCALE 1:80 000
1 0 1 2 3 4km

INSET A



INSET B

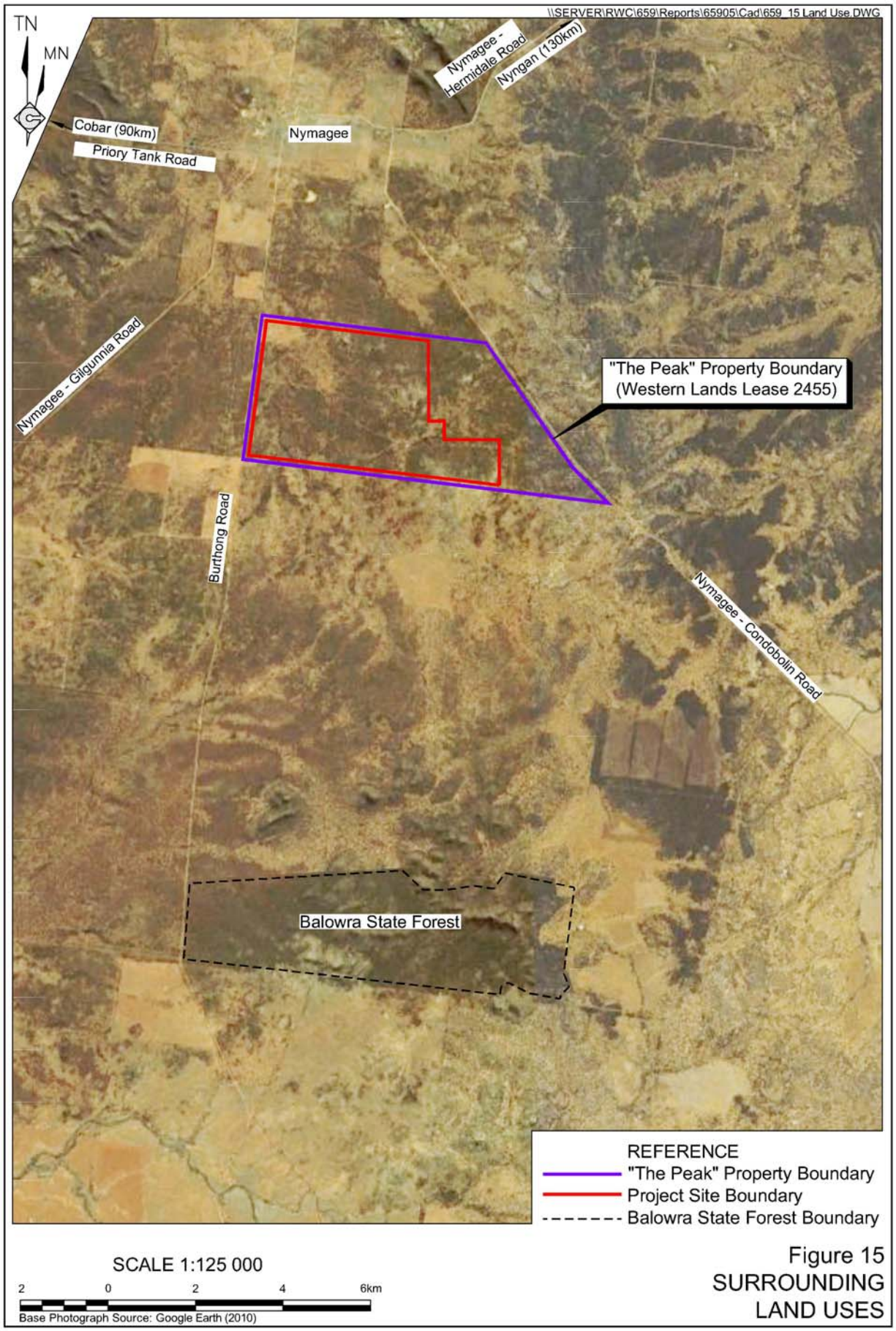


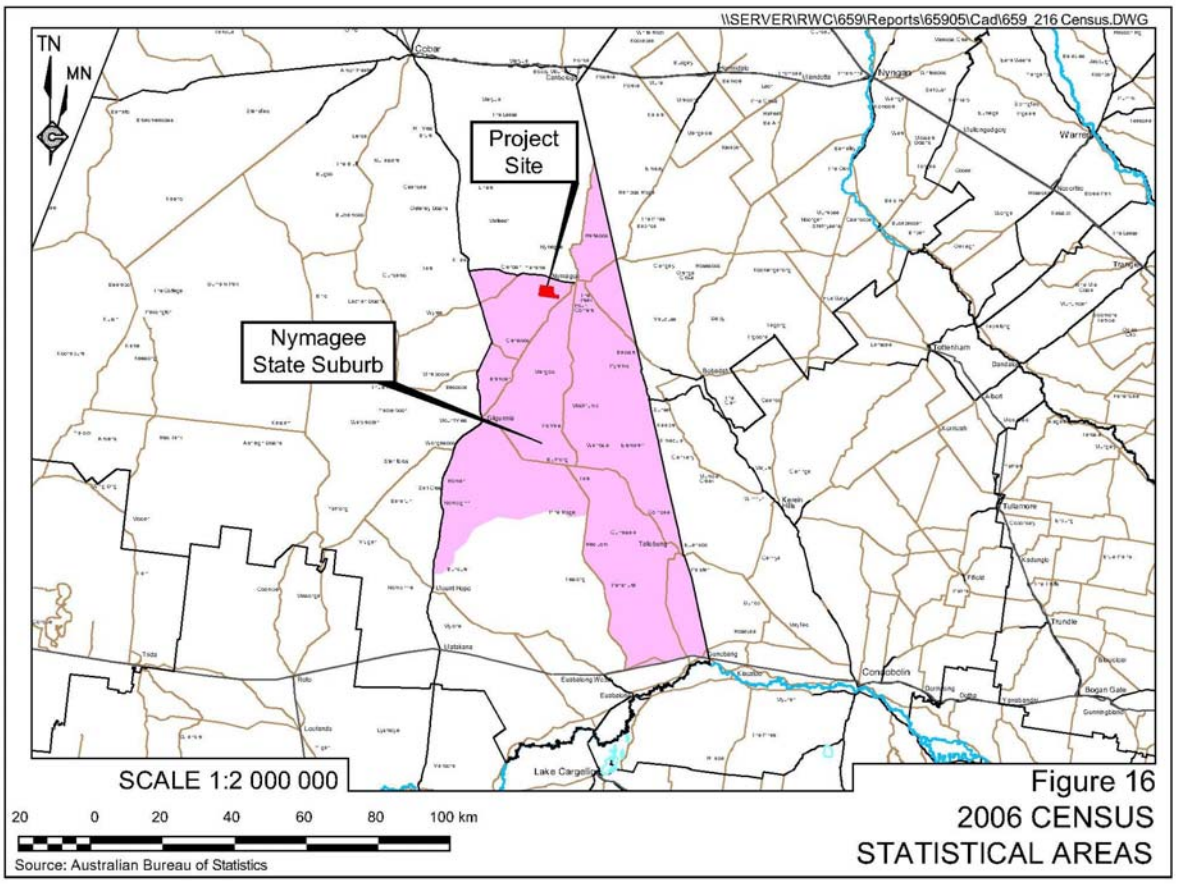
INSET SCALE 1:10 000
100 0 100 200m

Ref.	Land Owner
1	Perpetual Lease (YTC Resources Limited)
2	Perpetual Lease (JB Dunne)
3	State of NSW
4	Perpetual Lease (CW Dillon)
5	Perpetual Lease (CA & EA Halloran)
6	Perpetual Lease (JB Cutting)
7	Perpetual Lease (PG & MN Harley)
8	Perpetual Lease (Harley Balowra Pty Limited)
9	Perpetual Lease (EJ Harland)
10	Perpetual Lease (KJ Burcher)
11	BWT & GH Hay
12	G Hurst, G Woolnough, W Clarke, W Kelynack & G Lane
13	F Jolly, HWG Innes, TJ Glynn, JC Daw, H Harris
14	Trustees of Roman Catholic Church for Diocese of Wilcania-Forbes
15	Timbarra Estates Pty Limited
16	Preliminary Syndicate Limited
17	Perpetual Lease (WB Kilkeary)
18	JB Dunne
19	JB Cutting
20	Reference Not Held
21	Crown Land
22	Reference Not Held
23	Reference Not Held
24	Reference Not Held

Land Owner Source: Department of Lands Title Search July 2010

Figure 14
SURROUNDING LAND OWNERSHIP AND RESIDENCES


\\SERVER\RWC\659\Reports\65905\Cad\659_15 Land Use.DWG
TN
MN
Cobar (90km)
Priory Tank Road
Nymagee
Nymagee - Hermidale Road
Nyngan (130km)
Nymagee - Gilgunnia Road
"The Peak" Property Boundary
(Western Lands Lease 2455)
Burthong Road
Nymagee - Condobolin Road
Balowra State Forest
REFERENCE
"The Peak" Property Boundary
Project Site Boundary
Balowra State Forest Boundary
SCALE 1:125 000
2 0 2 4 6km
Base Photograph Source: Google Earth (2010)
Figure 15
SURROUNDING
LAND USES



7.1.5.2 Population and Population Growth

Table 12 presents a summary of the 2006 population statistics for Nymagee, Cobar LGA and NSW.

The data indicate that in Nymagee the proportion of persons aged 14 years and younger (23.1%) was similar to the proportion of persons of the same age group in Cobar Shire (22.9%) and NSW as a whole (19.8%).

In contrast, no persons aged 15 to 24 years were reported as residing in Nymagee. The proportion of that age group in Cobar LGA (13.8%) is similar to NSW (13.3%).

The proportion of people residing in Nymagee and Cobar LGA between the ages of 25 and 54 years (46.3% and 42.7%, respectively) was similar to the proportion for NSW (42.0%). However, the proportion of people aged 55 years and over in Nymagee (30.5%) is significantly higher than within Cobar LGA (20.5%) and NSW (24.8%).

The data indicate that a greater proportion of people aged over 55 live within and in the vicinity of township of Nymagee than in Cobar Shire or in NSW as a whole. This may be the result of a greater proportion of agricultural operations owned and operated by people with a higher average age than elsewhere, together with the lower cost of living.

The data recording no persons between the age of 15 and 24 is highly unusual and may reflect that on the day of the Census (8 August 2006) the limited number of people in that age group who may normally reside in Nymagee were elsewhere, and were therefore not recorded as residing in Nymagee.

During the 2001 Census, 115 persons were recorded within Nymagee (Collection district 1021108). As a result, the decrease in population between the 2001 and 2006 Census was approximately 6.4%. However, given the small population size, this change would not be statistically relevant. For the Cobar LGA, the population decrease between 2001 and 2006 was approximately 4% while for the NSW there has been an increase of approximately 4% in the same period. This may reflect changes in the local economic and employment situation within the Cobar LGA between 2001 and 2006.

Table 12
2006 Census Population Statistics

		Nymagee (State Suburb)		Cobar Shire (Local Government Area)		NSW State	
	Age Groups	**Persons**	**Percentage**	**Persons**	**Percentage**	**Persons**	**Percentage**
Children	0-4 years	12	11.1%	383	7.8%	420 431	6.4%
	5-14 years	13	12.0%	744	15.1%	878 483	13.4%
Studying or Working	15-24 years	0	0%	680	13.8%	871 717	13.3%
	25-54 years	50	46.3%	2101	42.7%	2 753 219	42.0%
Approaching Retirement or Retired	55-64 years	17	15.7%	478	9.7%	719 551	11.0%
	65 years and over	16	14.8%	533	10.8%	90 5778	13.8%
	Total Persons	**108**		**4919**		**6 549 178**	
Source: Australian Bureau of Statistics - 2006 Census							

7.1.5.3 Employment, Occupation and Industries

Table 13 presents the employment statistics from the 2006 Census for Nymagee, Cobar LGA and NSW. The data indicate that the unemployment rate in Nymagee in 2006 was 24.2%, significantly higher than for the Cobar LGA and NSW (4.9% and 6.0% respectively). The workforce participation rate in Nymagee was higher (60.2%) than the Cobar LGA (36.0%) and NSW (47.2%).

Table 13
2006 Census Employment Statistics

	Nymagee (State Suburb)		Cobar Shire (Local Government Area)		NSW State	
	Persons	**Percentage**	**Persons**	**Percentage**	**Persons**	**Percentage**
Employed						
Full-time(a)	43	65.2%	1579	69.4%	1 879 628	61%
Part-time	7	10.6%	517	22.7%	842 713	27%
Employed, away from work(b)	0	0%	68	3.0%	187 103	6%
Total	50	75.8%	2164	95.1%	2 909 444	94%
Unemployed, looking for						
Full-time work	12	18.2%	88	3.9%	115 165	4%
Part-time work	4	6.1%	33	1.5%	67 994	2%
Total	16	24.2%	111	4.9%	183 159	6%
Labour Force Participation						
Total labour force		53		1365		3 092 603
Total Persons		88		3790		6 549 177
Labour force participation		60.2%		36.0%		47.20%
Source: Australian Bureau of Statistics - 2006 Census						

Table 14 presents a summary of the 2006 Census statistics relating to industry of employment. The data indicate that 'Agriculture, forestry and fishing' employed almost two thirds of the Nymagee-based workforce (65.4%) and 'Mining' employed 15.4% of the workforce. In Cobar LGA 'Mining' employed the largest proportion (30.8%) of the workforce and 'Agriculture, forestry and fishing' employed 9.7% of the workforce. State-wide, 'Manufacturing', 'Retail Trade', 'Construction' and 'Healthcare & Social assistance' at approximately 10% each were the principal industries, while 'Agriculture, forestry and fishing' and 'Mining' employed just 3.4% total of the NSW workforce.

These trends reflect the generally rural nature of the area surrounding Nymagee and Cobar Shire and the importance of mining and agriculture for communities within the area.

Table 14
2006 Census Industry of Employment Statistics

	Nymagee (State Suburb)		Cobar Shire (Local Government Area)		NSW State	
	Persons	**Percentage**	**Persons**	**Percentage**	**Persons**	**Percentage**
Agriculture, forestry & fishing	34	65.4%	218	9.7%	78661	2.7%
Mining	8	15.4%	692	30.8%	20318	0.7%
Manufacturing	4	7.7%	86	3.8%	277986	9.6%
Electricity, gas, water & waste services	0	0%	12	0.5%	29184	1.0%
Construction	0	0%	97	4.3%	212729	7.3%
Wholesale trade	0	0%	74	3.3%	136761	4.7%
Retail trade	0	0%	184	8.2%	323929	11.1%
Accommodation & food services	0	0%	150	6.7%	190454	6.5%
Transport, postal & warehousing	3	5.8%	45	2.0%	145518	5.0%
Information media & telecommunications	0	0%	12	0.5%	68976	2.4%
Financial & insurance services	0	0%	18	0.8%	144867	5.0%
Rental, hiring & real estate services	0	0%	17	0.8%	50588	1.7%
Professional, scientific & technical services	0	0%	41	1.8%	213247	7.3%
Administrative & support services	0	0%	45	2.0%	90431	3.1%
Public administration & safety	0	0%	125	5.6%	174915	6.0%
Education & training	0	0%	134	6.0%	219679	7.6%
Health care & social assistance	3	5.8%	130	5.8%	304335	10.5%
Arts & recreation services	0	0%	14	0.6%	39574	1.4%
Other services	0	0%	81	3.6%	110094	3.8%
Inadequately described/Not stated	0	0%	71	3.2%	77194	2.7%
Total	**52**		**2246**		**2,909,440**	
Source: Australian Bureau of Statistics - 2006 Census						

7.1.5.4 Income

Table 15 presents the income statistics provided in the 2006 Census. The data indicate that median individual, family and household incomes in Nymagee were between 32.5% and 44.1% lower than NSW as a whole, while incomes in the Cobar Shire were comparable or higher than the corresponding incomes in NSW as a whole.

This difference is likely to be attributable to the fact that there are proportionally fewer people working in Nymagee than in Cobar Shire or NSW and that, typically, wages and salaries available for workers in rural areas are lower than other areas within the State.

Table 15
2006 Census Income Statistics

	Nymagee (State Suburb	Cobar Shire (Local Government Area)	NSW State
Median individual income ($/weekly)	311	455	461
Median family income ($/weekly)	604	1 257	1 181
Median household income ($/weekly)	579	1 054	1 036
Source: Australian Bureau of Statistics - 2006 Census			

7.1.5.5 Housing

Table 16 presents a summary of the housing cost statistics for Nymagee, Cobar LGA and NSW. The data indicate that none of the houses in Nymagee were occupied by tenants, and that the median monthly loan repayment in Nymagee was comparable to that for Cobar LGA, which was approximately $600 to $800 less than the NSW median. In addition, the average household size was marginally smaller in Nymagee than in Cobar LGA and NSW as a whole.

Table 16
Cost of Housing and Household Size Statistics - 2006

	Nymagee (State Suburb	Cobar Shire (Local Government Area)	NSW State
Median housing loan repayment ($/monthly)	771	900	1 517
Median rent ($/weekly)	0	120	210
Average number of persons per bedroom	1.1	1.1	1.1
Average household size	2.1	2.5	2.6
Source: Australian Bureau of Statistics - 2006 Census			

7.1.5.6 Nymagee Community Profile

Nymagee is a small village in central NSW, located approximately 100km by road from Cobar, 120km by road from Nyngan and 600km by road from Sydney.

Nymagee was originally a copper mining town and in its peak supported a population of over 2 200 people, half of those being Chinese migrants. However, when the Nymagee Copper Mine closed in 1917, most of the towns residents moved out. In 1999 local residents started an outback music festival to increase tourism and residents in the town. The first festival was visited by 600 tourists and the festival has since increased Nymagee's tourism by 60% and significantly increased the number of permanent residents.

Nymagee is also the setting of the poem "Clancy of the Overflow" a poem written by Banjo Patterson. The sheep station, "The Overflow"" featured in the poem is situated about 32 km southeast of Nymagee.

In the 2006 Census, Nymagee had a population of 108 people and a total of 23 families. There are 55 occupied private dwellings in a total of 73 private dwellings.

Community facilities in Nymagee include:

- a multi-function community hall;
- police station;
- Rural Fire Service shed
- tennis courts and pavilion;
- cricket oval and pavilion;
- CWA Hall;
- air strip; and
- community facility associated with the former Nymagee school.

The only non-farming commercial operation in Nymagee is the Metropolitan Hotel.

In summary, Nymagee is a small, close knit community where the majority of residents , if not all, know each other. Given the community size, the community is heavily reliant on surrounding centres (Cobar and Nyngan) for services and access to social, commercial, education and employment facilities.

7.1.5.7 Cobar Community Profile

Cobar LGA is located in the Orana Region of central northern New South Wales, approximately 700 km northwest of Sydney. Cobar LGA is bounded by Bourke LGA to the north, Bogan LGA to the north-east, Lachlan LGA to the south-east, Carrathool LGA to the south, and Central Darling LGA to the west.

Cobar LGA is a predominantly rural. The main population centre is Cobar, with small villages at Euabalong, Mount Hope and Nymagee. The LGA encompasses a total land area of approximately 44 000 km^2. Rural land is used mainly for agriculture, particularly sheep grazing, and for copper, lead, silver, zinc and gold mining.

The original inhabitants of the Cobar area were the Ngemba and Wongaibon Aboriginal people. European settlement dates primarily from the 1860s, with land used mainly for grazing. Population was minimal until 1870 when copper was discovered and the township of Cobar was established. Growth took place from the late 1800s into the early 1900s, spurred by copper mining. The population declined significantly following WWI, due to the closure of the Great Cobar Mine. The population gradually increased from the 1930s, aided by the establishment of gold mining. Copper mining recommenced in the 1960s. The population increased during the 1980s, boosted by the opening of a number of silver, lead and zinc mines. The population fluctuated slightly during the 1990s, and then was relatively stable between 2001 and 2006 at about 5 100 persons. The majority of the population of the LGA live in the township of Cobar.

Community facilities within Cobar include the following.

- TAFE NSW - Western Institute (Cobar College).
- The 31 bed Cobar District Hospital.

- One high school and two primary schools.
- Cobar aerodrome.
- Cobar Golf Course.
- Dalton Park Racecourse.
- Alisa Fitzsimmons Memorial Oval.
- Numerous parks, including the Bathurst Street Reserve.

Community organisations in Cobar include the following.

- Cobar Bowling & Golf Club.
- Cobar Memorial Services Bowling Club.
- Cobar Rugby League Football Club.
- Cobar Tennis Association.

In addition, Cobar has an active retail centre and a number of businesses operate within the town, including:

- two supermarkets;
- seven motels and three hotels;
- three service stations; and
- numerous small businesses, including retail outlets, hairdressers and service industries.

Finally, Cobar is connected to Nyngan (and Dubbo) to the east and Broken Hill (and Adelaide) to the west via the Barrier Highway, to Condobolin (and Sydney, Canberra and Melbourne) to the south east via the Kidman Way. In addition, Cobar is serviced by rail and regular air services are proposed to be introduced during 2010.

7.2 GROUNDWATER

The groundwater assessment is to be undertaken by the Impax Group. The resulting report will be presented in the *Specialist Consultant Studies Compendium* that will accompany the *Environmental Assessment.*

It is noted that a number of groundwater bores are located within and surrounding the Project Site. The Proponent has made application for licences for these bores, together with dewatering of the decline, and anticipates that that application will be determined prior to submission of the *Environmental Assessment* for the Public Exhibition stage. The Proponent anticipates that the licence allocations will be sufficient for the majority of the Project's water requirements.

In order to adequately assess the groundwater impacts associated with the Project, The Impax Group will:

- determine the quality of groundwater within and surrounding the Project Site;
- identify surrounding registered and un-registered groundwater users; and

- undertake a series of long-term pumping tests within the vicinity of the proposed decline as well as from the bores which are the subject of the licence applications to determine the sustainable yields from each and the extent of associated drawdown in groundwater levels.

7.3 NOISE AND BLASTING

7.3.1 Introduction

The noise and blasting assessment is to be undertaken by Spectrum Acoustics. The resulting report will be presented in the *Specialist Consultant Studies Compendium* that will accompany the *Environmental Assessment.*

7.3.2 Existing Environment

The existing noise environment surrounding the Project Site is typical of noise environments in rural setting. The noise environment is typically dominated by noise associated with agricultural operations, vehicles on roads, wind in the trees and insect and bird noise. Within the Project Site, noise associated with the Proponent's exploration operations is also a component of the noise environment. It is noted that during the period since the Proponent commenced explorations in September 2009, no noise-related complaints from surrounding residents have been received.

As a result of the above, he Proponent anticipates that the default nose assessment criteria of 35dB(A) identified in the *Industrial Noise Policy* will be applied to the Project during the day, evening and night. In addition, the Proponent anticipates that temperature inversions will be a feature of the environment surrounding the Project Site and noise impacts under such conditions will therefore be required to be assessed. The blasting assessment will utilise standard equations sourced from the United States Bureau of Mines.

Traffic noise assessment will also be undertaken to determine whether any residences in the vicinity of the Project Site and those along the proposed transportation routes will be impacted by the Project.

7.4 SURFACE WATER AND SOILS

7.4.1 Introduction

The surface water and soils assessment is to be undertaken by SEEC. The resulting report will be presented in the *Specialist Consultant Studies Compendium* that will accompany the *Environmental Assessment.* SEEC has completed the initial phase of their assessment, namely:

- a review of the soils of the Project Site and the constraints and opportunities provided by those soils;
- a review of the Project Site catchments (see Section 7.1.2.3); and
- a preliminary site water balance.

This section provides a summary of that work.

7.4.2 Existing Environment

7.4.2.1 Project Site Soils

The soils assessment involved the excavation of 18 soil test pits within the Project Site. The results of those test pits within gently sloped areas in the vicinity of the proposed Processing Plant and box cut may be summarised as follows.

- Topsoil is typically less than 150mm thick and may be gravelly.
- Subsoil is typically rubbly and extends from the base of the topsoil to a depth of between 500mm and 1 000mm below surface.
- The soils would be suitable for use during rehabilitation in areas with slopes less than 10%.

The results of those test pits in flat to very gently sloped areas in the vicinity of the proposed surface water dams may be summarised as follows.

- Topsoil is typically less than 300mm thick and grades into the subsoil.
- Subsoil is typically fine grained and fairly deep.
- The soils would be suitable for use during rehabilitation in areas of slopes less than 4%.

7.4.2.2 Site Water Balance

A preliminary site water balance was prepared by SEEC using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) developed by the CRC for Catchment Hydrology. The water balance assumed or used the following information.

- A make-up water requirement of approximately 187ML/year.
- Forty eight years of pluviougraph rainfall data from the Cobar Bureau of meteorology station.
- Surface water capture and storage within the proposed Back Tank East and expanded Pete's Tank (**Figure 5**). The existing volume of Pete's Tank is 1.4ML. For the purposes of the water balance, calculations were also made assuming that the final volumes of the dams would 20ML and 90ML for proposed Back Tank East and expanded Pete's Tank, respectively

The results of the preliminary water balance indicated the following.

- The existing dams would not be able to provide the required make-up water.
- If the proposed Back Tank East was constructed and Pete's Tank expanded the Project's required make up water would not be met all the time.

- Approximately 97% of water that would flow into the proposed Back Tank East expanded Pete's Tank would continue to flow past the dams, i.e. these dams would not impact upon the downstream hydrology, both in terms of flow rates and the frequency of flows. This is a reflection of the fact that most rainfall occurs as infrequent, large storm events.

In light of the results of the site water balance and the fact that the Project will require a reliable water source, the Proponent does not propose to rely on water from surface water storages. Rather, water for processing and other mining-related purposes would be sourced from groundwater.

7.5 ECOLOGY

7.5.1 Introduction

The ecology assessment is to be undertaken by OzArk Environmental and Heritage Management Pty Ltd (OzArk). The resulting report will be presented in the *Specialist Consultant Studies Compendium* that will accompany the *Environmental Assessment.*

The results of the database searches, the field survey identification of threatened and other species and communities within the Project Site and those listed species and communities that were not observed but have the potential to utilise the Project Site, and the Seven-part Assessments of Significance will be presented in the ecology report. This section provides a summary of that work. A more detailed summary, including a summary of the survey methodology, will be provided in the *Environmental Assessment*. The summary would also provide the Proponent's Biodiversity Offset Strategy, including the proposed offset area.

7.5.2 Existing Environment

7.5.2.1 Flora Survey Results

Flora field surveys were carried out over four and half days between 25 and 29 April 2010. One threatened species of plant, namely Lobed Blue-grass (Bothriochloa biloba), was recorded within the Project Site. No endangered ecological communities were identified within the Project Site.

In addition to the identified threatened species, OzArk determined that the Cobar Greenhood Orchid (*Pterostylis cobarensis*) and *Bothriochloa biloba* have the potential to occur within the Project Site.

7.5.2.2 Vegetation Communities

The ecology assessment identified four principal vegetation communities and four sub-communities as follows.

- Benson 103 – Poplar Box – Gum-barked Coolibah – White Cypress Pine shrubby woodland. This community includes the following sub-communities.
  - Benson 103 – Bimble Box-dominated;
  - Benson 103 – White Cypress Pine dominated;

  - Benson 103 – Bothriochloa Biloba;
  - Benson 103 – Eremophila and hopbush regrowth;
  - Benson 103 – Yarren (*Acacia hemaphylia*).
- Benson 174 Mallee – Smooth-barked Coolibah woodland;
- Benson 180 – Grey Mallee – White Cypress Pine woodland;
- Cleared grassland/shrubland.

7.5.3 Fauna Survey Results

OzArk identify that a total of 103 vertebrate fauna species were identified within the Project Site, of which 11 are introduced species. The identified species included the following.

- Five reptile species.
- Three frog species.
- Seventy six bird species, including eleven species listed under the *Threatened Species Conservation Act 1995* (TSC Act) and one listed under the *Environmental Protection Biodiversity and Conservation Act 2000* (EPBC Act).
- Seven species of terrestrial mammal.
- Nine species of microchiroptean bat species, including two species listed under the TSC Act.

OzArk state that the following listed species were either observed or have the potential to occur with the Project Site.

- Kultarr (*Antechinomys laniger*);
- Major Mitchell's Cockatoo (*Calyptorhynchus leadbeateri*.
- Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*).
- Little Pied Bat (*Chalinolobus picatus*).
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis* (eastern subspecies).
- Hooded Robin (*Melanodryas cucullate*).
- Chestnut Quail-thrush (*Cinclosoma castanotus*).
- Speckled Warbler (*Chthonicola sagittate*).
- Pied Honeyeater (*Certhionyx variegates*).
- Diamond Firetail (*Stagonopleura guttata*).
- Superb Parrot (*Polytelis swainsonii*).
- Black-chinned Honeyeater (*Melithreptus gularis gularis* (eastern subspecies).
- Turquoise Parrot (*Neophema pulchella*).
- Spotted Harrier (*circus assimilis*).

The anticipated significance of the Project on each of these species will be assessed in the *Environmental Assessment*. Separate assessments will be provided for those species listed under the TSC Act and the EPBC Act.

7.6 HERITAGE

7.6.1 Introduction

The heritage assessment is to be undertaken by OzArk. The resulting report will be presented in the *Specialist Consultant Studies Compendium* that will accompany the *Environmental Assessment.*

OzArk has completed the initial phase of their assessment, namely the field assessment and identification of sites of Aboriginal and non-Aboriginal heritage significance. In addition, the initial stages of the consultation program with the Aboriginal community have been completed in accordance with the requirements of the document *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* published by the Department of Environment, Climate Change and Water in April 2010. This section provides a brief summary of that work. A more detailed summary, including a summary of the survey methodology and details of the consultation undertaken, will be provided in the *Environmental Assessment*.

7.6.2 Existing Aboriginal Heritage Environment

No Aboriginal sites or objects were recorded during the survey. It is assessed that there is a low probability of there being further undetected archaeological deposits within the Project Site based on the results of the survey, previous surveys in the region and the landform within and in the vicinity of the Project Site.

7.6.3 Existing non-Aboriginal Heritage Environment

No items of non-Aboriginal heritage significance were recorded within the Project Site.

Several examples of timber-getters toe-holds in trees were recorded. Based on the evidence that OzArk has been able to obtain, these toe-holds may have been made in the early 20th century by Chinese workers who supplied mine stays to the nearby Nymagee Copper Mine. However, there is no way to accurately determine the date of the toe-holds or the ethnicity of the people who made them. Based on the evidence available, OzArk has assessed these toe-holds as holding little historic significance.

7.7 AIR QUALITY AND GREENHOUSE GASES

7.7.1 Introduction

The air quality and greenhouse gas assessment is to be undertaken by Environ Australia. The resulting report will be presented in the *Specialist Consultant Studies Compendium* that will accompany the *Environmental Assessment.*

7.7.2 Existing Environment

The existing dust environment within and surrounding the Project Site is typical of dust environments in rural areas where the principal sources of particulate matter are associated with agricultural operations, vehicles on roads and wind erosion of non-vegetated areas. Within the Project Site, dust emissions associated with the Proponent's exploration operations is also a component of the local dust environment.

The particulate matter assessment will be undertaken in accordance with the document *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* published by the then Department of Environment and Climate Change in 2005.

In addition, the greenhouse gas assessment will be undertaken in accordance with the following documents, both .published by the Federal Department of Climate Change.

- National Greenhouse and Energy Reporting (Measurement) Determination.
- Technical Guidelines for the Estimation of Greenhouse Emissions and Energy at Facility-Level - Energy, Industrial Process and Waste Sectors in Australia.

Given the distance from the proposed activities to the closest residences, the Proponent does not envisage that air quality-related matters will pose a constraint on the Project. In addition, given the small scale of the Project, the Proponent does not anticipate that greenhouse gas or other air-borne pollution-related matters will pose a constraint on the Project.

7.8 TRAFFIC

The traffic and transportation assessment is to be undertaken by Traffic Solutions. The resulting report will be presented in the *Specialist Consultant Studies Compendium* that will accompany the *Environmental Assessment.*

The impact of the Project on the surrounding road network will be undertaken based on vehicle movements presented in **Table 9**.

Traffic Solutions has completed a preliminary assessment of the potential heavy vehicle transportation routes. That assessment concluded that transportation of concentrate material using heavy vehicles, including B-doubles and road trains (subject to confirmation of intersection layouts), would not adversely impact on traffic on the roads surrounding the Project Site. The preliminary assessment did, however, note that use of the Nymagee – Hermidale Road by heavy vehicles would most likely not be appropriate. As a result, the Proponent would ensure that Project-related heavy vehicle traffic did not use the Nymagee – Hermidale Road.

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