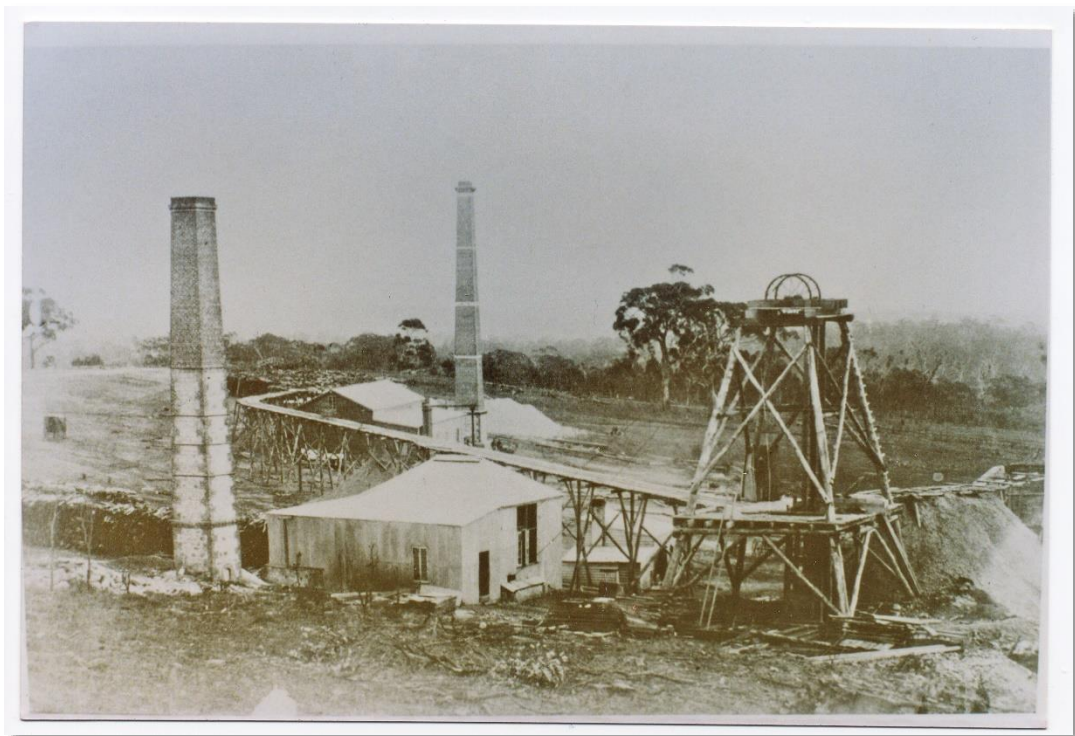




Bird in Hand Gold Project  
Mining Lease Application  
MC 4473

# CHAPTER 1

## INTRODUCTION



## BIRD IN HAND GOLD PROJECT

### MINING LEASE PROPOSAL



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A declaration has been made on behalf of Terramin Exploration Proprietary Limited and Terramin Australia Limited by its Chief Executive Officer that he has taken reasonable steps to review the information contained in this document and to ensure its accuracy as at 31<sup>st</sup> May 2019.

Subject to that declaration:

- (a) in writing this document, Terramin Exploration Proprietary Limited and Terramin Australia Limited have relied on information provided by specialist consultants, government agencies, and other third parties. Terramin Exploration Proprietary Limited and Terramin Australia Limited have reviewed all information to the best of their ability but do not take responsibility for its accuracy or completeness; and
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## COMPETENT PERSON STATEMENT

The information in this report that relates to Bird in Hand Exploration Results and Mineral Resources is based on information compiled by Mr Dan Brost, a Competent Person who is a Chartered Professional Member of The Australasian Institute of Mining and Metallurgy (AusIMM). Mr Brost is employed as a consultant to Terramin Australia Limited. Mr Brost has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Brost consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

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## EXECUTIVE DECLARATION

The information contained in this report is to the best of my knowledge a true and accurate representation of the proposed Bird in Hand Gold Project. Terramin Australia Ltd and Terramin Exploration Pty Ltd has taken all reasonable steps to review the information contained herein to ensure the accuracy as at the date of submission.

Terramin is committed to working with communities to maximise the benefits and minimise the impacts resulting from our activities.

Name	Position	Signature	Date
Richard Taylor	Chief Executive Officer		21/06/2019

## 1 INTRODUCTION

Terramin Australia Limited and its subsidiary Terramin Exploration Proprietary Limited (Terramin) is proposing to develop a small, high-grade underground gold mine, which targets the historic Bird in Hand Gold deposit, located approximately 35 km east from Adelaide, and 30 km north of Terramin's existing processing facilities (Angas Processing Facility (APF)) at the Angas Zinc Mine (AZM), near Strathalbyn – shown below in Figure 1-1. The proposed mine is known as the Bird in Hand Gold Project (the 'Project' or 'BIHGP').

The proponent for this Mining Lease Application, Terramin Exploration Pty Ltd, is a wholly owned subsidiary of Terramin Australia Limited. All references to Terramin in this document may be taken to refer to either Terramin Exploration Pty Ltd as well as Terramin Australia. At a very high level, the Project has a Resource of 265,000 ounces of gold at 12.6 g/t. The Project will be South Australia's highest grade gold mine and one of Australia's highest grade gold mines. The Project will provide employment opportunities and positive economic outcomes to the regional communities of Woodside and Strathalbyn, and more broadly, South Australia. The increase in inputs into diversifying the local economy, and provides opportunity for South Australian mining professionals to work close to home as well as provide career paths for young South Australians are all positive aspects associated with this development.

The gold bearing ore will be mined in an underground mine at the BIHGP site (the 'site'), and transported via truck to the APF to be beneficiated to produce a gold concentrate product for sale. No gold concentrate processing infrastructure or tailings storage is required at the site. This Mining Lease Proposal (MLP) should be read in conjunction with the submitted Miscellaneous Purposes License application (reference number 2019/0826) for the APF.

In summary it is estimated that:

- The Project will generate a total positive impact on Gross State Product of an estimated \$222 million over 8 years (excluding the Gross Operating Surplus of the mining operation itself).
- This includes \$185 million of estimated wages and salaries paid to households, and the provision of a modelled 2,380 person years of employment (or an average of around direct and indirect 600 full time equivalent jobs at its peak – equating to 2350 Full time Equivalent (FTE) jobs over the life of the Project). Only 25% of the jobs created are in Project operations itself. The remainder is spread through the rest of the economy and impacts on sectors such as retail trade, business services, education, health services etc. generated through a combination of the support spend for the project, but also the on-spend of wages and taxes generated.
- The beneficial economic impact will peak in years 3 and 4 of the project.
- 60% of the economic benefit will occur in the Adelaide Hills Council area, around Woodside (an estimated 420 FTEs at peak equating to 1400 FTE over the life of the project), and 20% would be expected in the Fleurieu Peninsula, around Strathalbyn (an estimated 170 FTEs at peak equating to 500 FTE over the life of the project).

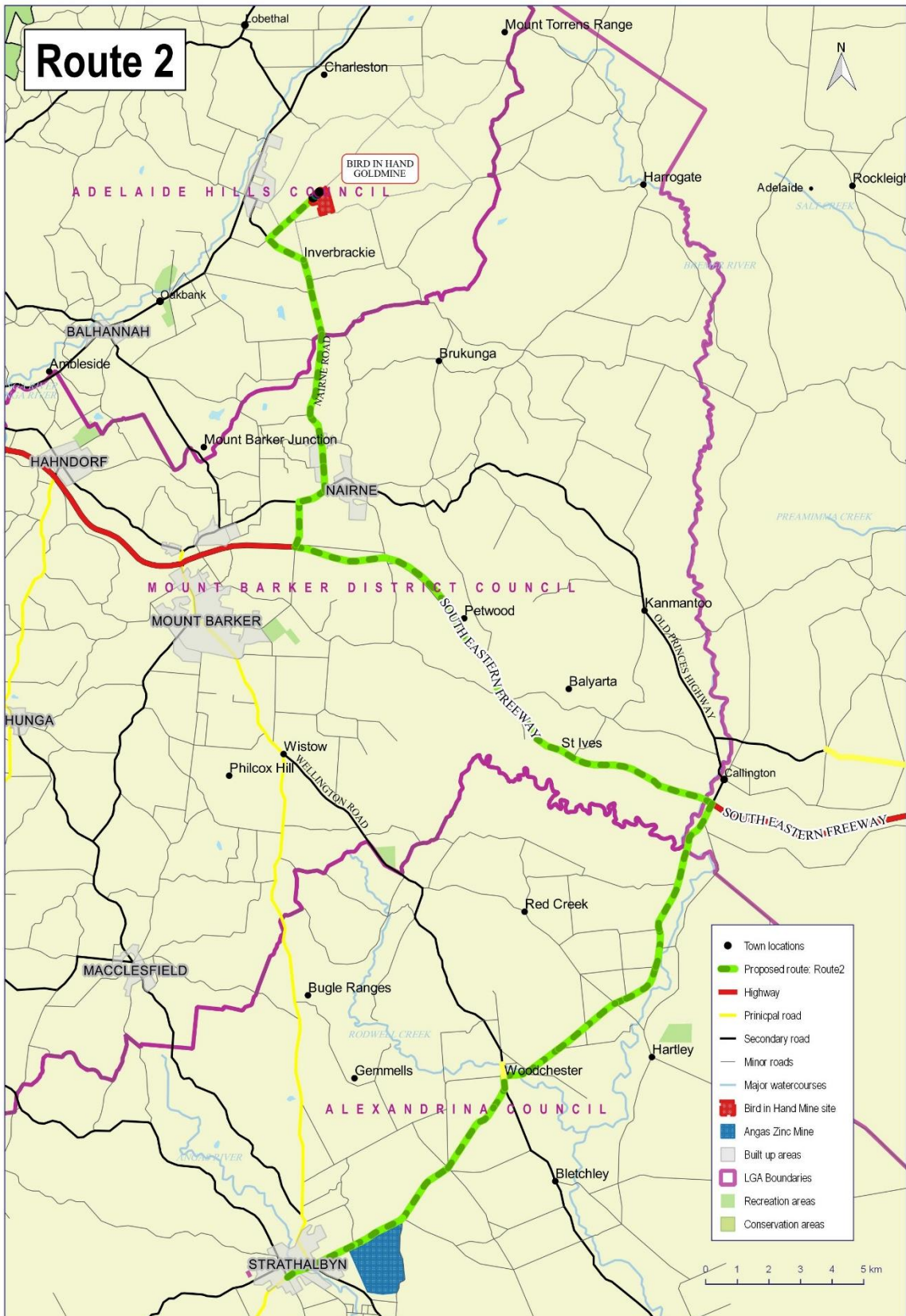


FIGURE 1-1 | LOCATION OF THE BIRD IN HAND GOLD PROJECT (BIHGP) AND THE ANGAS PROCESSING FACILITY (APF)

The proponent for the Project and the associated Mining Lease (ML) is Terramin Exploration Pty Ltd, a wholly owned subsidiary of Terramin Australia Limited (Terramin). All references to Terramin in this document may be taken to refer to either Terramin Exploration as well as Terramin Australia.

The Project has a Joint Ore Reserves Committee (JORC) Resource of 650,000 tonnes at 12.6g/t for 265,000 contained ounces of gold and 5.8g/t for 122,000 tonnes contained ounces of silver. The JORC Code Table 1 of Assessment and Reporting Criteria for the BIHGP is listed in Chapter 3 of this report. The mineralisation is located within Terramin's exploration licences 5469 (EL 5469) and 6319 (EL 6319), which collectively cover approximately 31,400 hectares. The mineralisation lies within the proposed ML, which covers approximately 195 hectares. The proposed ML boundary does not exceed that of MC 4473, and is the subject of this application.

Minimal infrastructure is required at the Project site, as processing will occur at AZM. Site infrastructure outside of the underground access and workings includes a workshop, batching plant, water treatment plant and dam, offices and an integrated mullock landform (IML) for excess mullock. Mullock is unmineralised rock which does not contain gold removed during development of the decline and access drives. The underground design includes an underground magazine, as well as ventilation raises and a secondary means of egress (emergency escape-way).

AZM, which includes the APF, operated under the approved ML 6229 and was placed into care and maintenance in October 2013 due to the falling metal prices. AZM mine was developed on the zinc-lead-copper-gold-silver deposit and the mine site incorporates the processing facilities, tailings storage facility (TSF) and general site infrastructure required to process 440,000 tonnes of ore annually. The care and maintenance plan keeps the infrastructure in a suitable condition for restarting the facility. With minor modification, the processing plant will be able to treat the precious metal ore feed from the Projects.

Terramin would like to take this opportunity to publically thank all of the consultants and community members who have worked tirelessly to develop this MLP.







## 1.1 TERRAMIN COMPANY PROFILE

Terramin Australia Limited, the parent company of Terramin Exploration Pty Ltd, owns and operated AZM.

Terramin engages in the exploration, evaluation and development of base and precious metal projects in Australia and overseas. Terramin has a clear focus on growing a production pipeline of base and precious metal projects close to infrastructure and with low capital and operating costs. Consistent with this focus, Terramin holds a number of highly prospective mineral deposits and exploration tenements across South Australian and Northern Africa.

Projects include the flagship Tala Hamza Zinc Project, located in Algeria, the BIHGP, AZM and the Adelaide Hills and Gawler Ranges exploration tenements in South Australia. In total, the Group has access to 3 billion pounds of zinc and 265,000 ounces of gold in situ.

Terramin has a highly capable team to take projects from exploration through feasibility to production. This team is supported by a Board which has extensive business and project development experience

The safety of everyone involved in operations is at the core of the Company's philosophy. The primary objective is to operate in a safe manner that builds long term, sustainable value for shareholders.

Contact details for Terramin are provided below in Table 1-1.

TABLE 1-1 | COMPANY CONTACT DETAILS

Contact Detail	Proponent Details
Applicant	Terramin Exploration Pty Ltd
Contact Person	Richard Taylor (CEO)
Address	Unit 7 / 202-208 Glen Osmond Road, Fullarton, 5063, SA
Contact number	(08) 8213 1415
Email	info@terramin.com.au
Website	www.terramin.com.au

## 1.2 CORPORATE HISTORY

Terramin Australia Limited was incorporated in December, 1993 as Playford Resources NL with the objective of exploring and developing Australian mineral resources opportunities.

In 1997, the Company acquired the Fleurieu Project situated in Australia’s first base metals mining belt east of Adelaide. The tenements included the Angas lead-zinc-silver resource.

Terramin acquired the Menninnie Dam tenement in 2003 containing South Australia’s largest zinc-lead-silver deposit. Later that year, the company listed on the Australian Securities Exchange (ASX) in a fully underwritten Initial Public Offering (IPO).

In 2006, Terramin acquired a 65% interest in the world class Tala Hamza Project on the Mediterranean coast of Algeria. Terramin’s joint venture partner is an Algerian government mining entity (ENOF). The project is based around an underhand drift and fill mining method producing 1.32Mtpa that is processed using flotation to produce metal concentrates for sale.

The AZM at Strathalbyn in South Australia was commissioned in July 2008. The first shipments of zinc and lead concentrate were dispatched in the same month. In September 2013 the mine was placed into care and maintenance.

In December 2013, Terramin acquired the BIHGP and a portfolio of highly prospective Adelaide Hills exploration tenements. An internal Scoping Study was completed early in the same month and was updated in 2018.

Terramin’s major shareholder is Asipac Capital Pty Ltd and its direct associated entities (incl. the Asipac Group of Companies), located in Melbourne, Australia. The Asipac Group holds approximately 33% of Terramin’s shares on issue. The Asipac Group are diversified based organisations with a broad spectrum of business enterprises which include: real estate division; resources division; project/funds management, Mergers and Acquisitions and IPOs. Terramin Executive Chairman Feng Sheng is also the Chairman of the Asipac Group.

An overview of Terramin’s directors and project management is included in Table 1-2.

TABLE 1-2 | TERRAMIN DIRECTORS AND PROJECT MANAGEMENT

Director	Role	Background
<b>Feng Sheng</b>	Executive Chairman	Mr Sheng is Chairman of Melbourne based Asipac Group (including Asipac Capital Pty Ltd and Asipac Group Pty Ltd) (Asipac). He has owned and operated several businesses over the years predominantly focused in property investment and development. Asipac is an active investor in the resources sector and a significant shareholder in Terramin. Asipac is also an active member of the Australia China Business Council and sponsors the organisation at both a national and state level. He is also a Director of Western Mediterranean Zinc Spa (WMZ), the company which owns and operates the Oued Amizour Zinc Project in Algeria.
<b>Michael Kennedy</b> <i>B.Com (Economics)</i>	Non-Executive Deputy Chairman	Mr Kennedy has enjoyed a 40 year career in the nonferrous mining and smelting industry, and has held a number of senior marketing and logistics roles with the CRA/RTZ Group, managing raw material sales from the Bougainville, Broken Hill, Cobar and Woodlawn mines, managed raw material purchases and supply into the Port Pirie lead smelter, Budel zinc smelter (Netherlands), and the Avonmouth (UK) and Cockle Creek (Newcastle) zinc-lead smelters. He was the resident Director of the Korea Zinc group of companies in Australia from 1991 until 2005, which encompassed the construction and commissioning of the Sun Metals zinc refinery in Townsville. Mr Kennedy is Deputy-Chairman of the Board, and a member of the

Director	Role	Background
		Audit, Risk and Compliance Committee, the Nominations and Remuneration Committee.
<b>Angelo Siciliano</b> <i>FIPA, Registered Tax Agent, BBus</i>	Non-Executive Director	Mr Siciliano has more than 20 years of experience as an accountant in property development and financial services. Mr Siciliano is the Chief Financial Officer of Asipac and for the last 16 years has owned and managed an accounting practice predominantly focussing a fellow of the Institute of Public Accountants and is a Director of ASX listed Resource Base Limited. He is a member of the Company's Audit, Risk and Compliance Committee, and of the Nominations and Remuneration.
<b>Kevin McGuinness</b> <i>BAA, ACA</i>	Non-Executive Director	Mr McGuinness is a finance executive with more than 20 years of experience as a Director and in executive management with ASX listed and private companies in the mining, medical equipment industries and not-for profit organisations. Mr McGuinness was previously the Chief Financial Officer of Exact Mining Services. He is the current Chairman of Zero Waste SA, a Director and former Chairman of the Royal Zoological Society of SA and a former Director of Ellex Medical Lasers Limited. Mr McGuinness is Chair of the Audit, Risk and Compliance Committee, the Nominations and Remuneration Committee and Independent Review Committee. Mr McGuinness is also a Director of WMZ.
<b>Wang Xingyu</b>	Executive Director	Mr Wang is a vice president of NFC and is currently a director of Industrial Construction Corporation LLC (Mongolia), China Nerin Engineering Co. Ltd and NFC India Pvt. Ltd. Mr Wang has project management experience in a number of smelting and mining operations in the Middle East and Central Asia, notably the Iran Yazd Zinc Mine and Smelter and the Arak Aluminium Smelter Project.
<b>Richard Taylor</b> <i>MBA, LLM, BEc, LLB, Grad Dip Leg Prac, GAICD</i>	Chief Executive Officer	Mr. Taylor is a mining executive with more than 15 years' experience in senior international and resource sector roles. He was most recently Managing Director of PanAust Ltd's Asia business subsidiary, Phu Bia Mining Limited, where he held responsibility for business development initiatives in Myanmar and exploration in Laos. He has held senior executive roles with Mineral Deposits Limited, Oxiana Ltd, MMG and the World Bank. Mr Taylor is a graduate and member of the Australian Institute of Company Directors (GAICD) and has held board roles with a number of companies and not for profit organisations. He holds an MBA from the University of Cambridge and is a qualified lawyer admitted to practice in New South Wales.

### 1.2.1 OPERATOR CAPABILITY

The following section outlines Terramins capability as a mining operator based on the AZM. Terramin will develop similar policies and procedures for the BIHGP as part of the PEPR process.

Terramin operated the AZM in accordance with the company's corporate principles which are reflected in the environment, community and health and safety policies (Appendix A3). Operating procedures developed for the mine incorporate evaluation of the impact on the environment. In creating the operating procedures consideration was given to ensure all lease conditions and outcome measurable criteria are complied with. This approach extends to both Job Safety Analysis (JSA's) carried out prior to the commencing non-standard tasks and to the Standard Operating procedures (SOPs) that will be established for processes or activities that pose an extreme or high risk.

Auditing and review of procedures based on a policy of continual improvement is used to manage any variances encountered between actual and best practice. Terramin have an Occupational, Health and Safety Manager and an Environmental Superintendent who facilitate these processes. Reporting of the outcome measurable criteria through Quarterly Environmental Reports and the annual Mining and Rehabilitation Compliance Report identify any shortcomings in the Environmental Management System.

Terramin is committed to ensuring the protection, integrity, accuracy and currency of all our knowledge and information. Terramin recognises that knowledge and information is a vital asset that supports our ongoing operations and that effective management of this knowledge and information is critical to our ongoing success. In 2011, Terramin introduced a document management system and intranet, based on Microsoft SharePoint, which standardises the way we manage, protect, approve, disseminate and store controlled documents. Terramin's document management system controls the life cycle of documents at Terramin; how they are created, reviewed, and published, and how they are ultimately disposed of or retained. It is envisaged this system or similar will be employed for the life of the BIHGP.

A Health Safety Environment and Community management system called InControl was implemented in 2011. InControl is a high level risk management system to document employee training, track events, incidents (including environmental) and register risks. Terramin is also subscribed to ChemFFX for complete access to their online MSDS data base.

### 1.3 HISTORY OF THE BIRD IN HAND GOLD PROJECT

The Bird in Hand (BIH) gold mine was one of 17 gold mines in the Woodside gold field during the 1800's. The historic BIH deposit has had a varied history. It started in July 1881, with the discovery of gold by Dr. D M<sup>c</sup>Cracken. Soon after the Bird in Hand Gold Mining Company was formed and mining commenced with Dr M<sup>c</sup>Cracken as the first mine manager. The mine commenced on the outcropping ore and was chased to depth. By the end of 1889 the BIH mine included eight shafts, adits and stopes, the deepest shaft extending 125 m deep. The BIH gold mine had good grades and produced 10,500 ounces of the 30,000 ounces produced from the Woodside gold field. The last development of the mine was the construction of the Victoria shaft with the aim of deepening the workings. It would appear that the company came under financial pressure and closed the mine.

Many different companies, including the South Australian government, had interests in the BIH gold mine over the following 60 years. The mine was abandoned in 1935 and utilised as a water source for the Commonwealth Government supplying 180 ML of water per annum to the settlement of Inverbrackie until 1967.

Since the 1970's, the area surrounding BIH has been held by a mixture of junior exploration companies and major international mining houses, shown in Table 1-3. The last gold production from the site was from the retreatment of the BIH tailings in the early 1990's.

Companies prior to Newmont Exploration Limited (Newmont) did not progress past literature searches. Newmont undertook regional stream surveys and minor rock chip sampling but none of the work covered the Woodside Goldfield. Modern exploration recommenced in 1993, mainly limited to surface sampling and mapping, by Capricorn Resources. Exploration efforts were further refined around and below the old workings. A comprehensive drilling campaign has been undertaken since this time to define the Resource that is the focus of this application.

Terramin currently hold ELs 5469 and 6319 which contain the Woodside Goldfield.

A more detailed description of historic mining at the BIH deposit is provided in Chapter 20: Heritage.

TABLE 1-3 | EXPLORATION LICENCES RELEVANT TO THE WOODSIDE GOLDFIELD

Tenement	Licences	Start	Expired
EL 779	Western Queen (Sa) Pty Ltd (100%)	12/01/1981	11/01/1982
EL 1247	BHP Billiton Minerals Pty Ltd (100%)	24/09/1984	13/02/1986
EL 1486	Aztec Mining Company Ltd (100%)	6/05/1988	17/02/1989
EL 1723	Newmont Exploration Pty Ltd (100%)	21/05/1991	15/07/1992
EL 1869	B2b Net Technology Ltd (50%);	29/09/1993	28/09/1998
	Indo Mines Limited (25%);		
	Statelink Holdings Pty Ltd (25%)		
EL 2585	Indo Mines Limited (75%); Statelink Holdings Pty Ltd (25%)	4/03/1999	3/03/2004
EL 3215	Flinders Mines Limited (100%)	24/06/2004	23/06/2009
EL4303	Maximus Resources Limited (100%)	1/09/2009	31/08/2013
EL5469	Terramin Exploration Pty Ltd (100%)	01/09/2014	31/08/2019
EL5568	Terramin Exploration Pty Ltd (100%)	25/02/2014	24/02/2019
EL6319	Terramin Exploration Pty Ltd (100%)	25/02/2019	24/02/2021

In the early 1970s the western half of the Woodside Goldfields was held by Kanmantoo Mines Ltd under Special Mining Lease (SML) 692. SML 692 was taken up to explore for extensions of the Kanmantoo copper gold between the Kanmantoo Mine and at the time the proposed South Eastern Freeway. Between 1983 and 1997 there were three separate MLs held over an area between the BIH and Brind

mines, no records have been found that documents if any mining occurred or what work was undertaken.

The first modern drilling to be undertaken at BIH was undertaken by Capricorn Resources in 1997. Eleven RC percussion holes were drilled on four prospects for a total of 1,129 metres. Four of these holes; BH009 to BH012 were drilled at BIH, the remaining holes were drilled at surrounding prospects including Bird Extended, Ridge South and Blackbird.

In 2007 Flinders Mines, a sister company of Maximus was granted MC 3783 that essentially covered the historic BIH workings. Flinders Mines dropped their mineral claim in 2008 and a much larger claim was then lodged by Maximus.

In 2017 Terramin lodged a mineral claim for a similar area as is held by MC 4113. Maximus continue to hold MC 4113 in a trust agreement for Terramin. MC 4113 expired during 2018, however, the same area has been repegged over with approval under s. 27 of the *Mining Act 1971* - MC4473.

TABLE 1-4 | MINERAL CLAIMS RELEVANT TO THE BIRD IN HAND GOLD DEPOSIT

Tenement	Status	Leases	Hectares	Start	Surrendered	Expired
SML 692	Cancelled	Kanmantoo Mines Ltd		26/04/1972		25/04/1973
ML 5169	Cancelled	Maslen, Grant	3.94	16/12/1983		15/12/1986
ML 5458	Cancelled	Bramley, Martin	3.94	2/09/1987		1/09/1990
ML 5683	Surrendered	Selga, Mark	3.94	31/08/1990	16/07/1991	30/08/1997
MC 3783	Surrendered	Flinders Mines Ltd	1.4	23/04/2007	3/04/2008	22/04/2008
MC 4113	Active	Maximus Resources Limited	195.9	12/11/2008		
MC 4421	Expired	Terramin Exploration	195.5	01/09/2017		31/08/2018
MC 4473	Active	Terramin Exploration	195.5	28/05/2019		

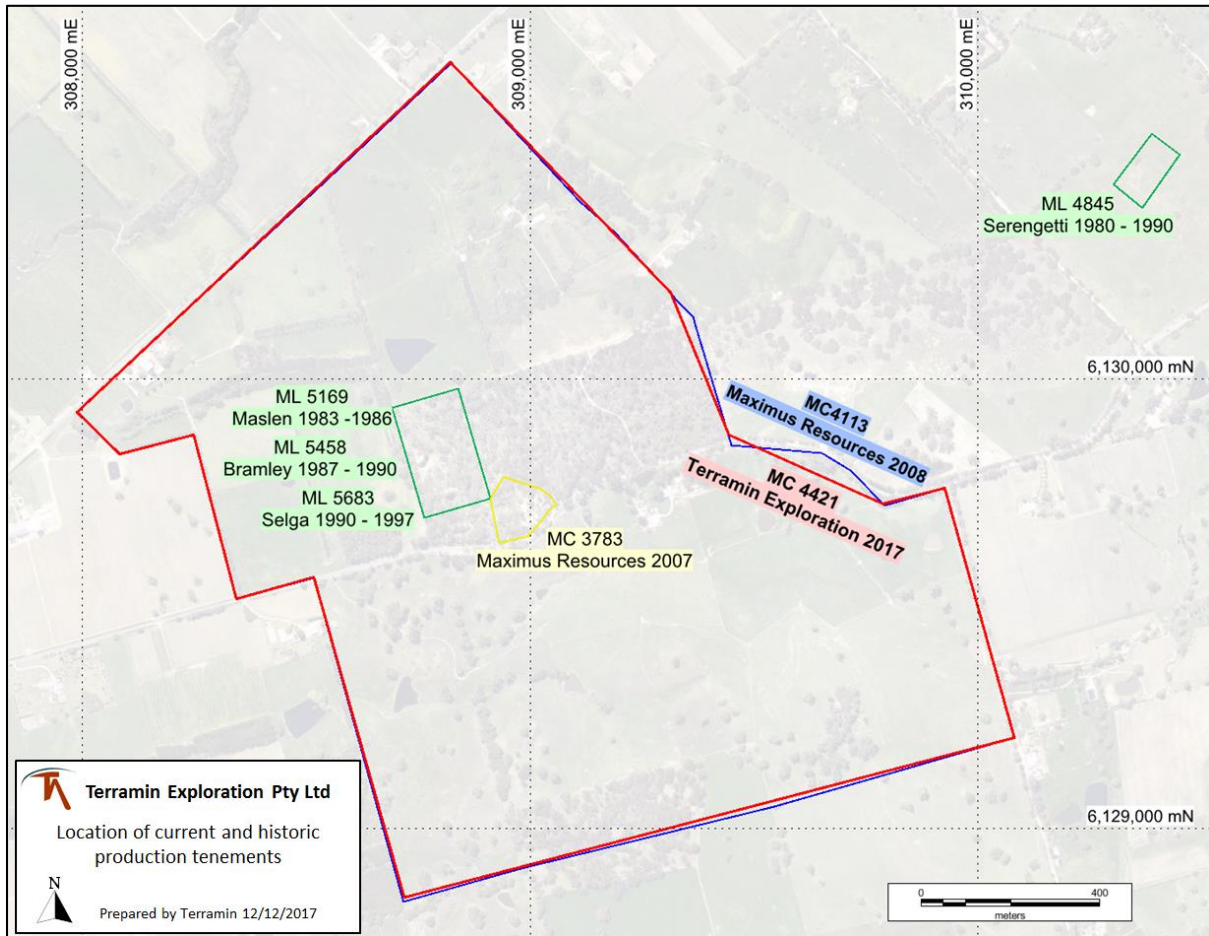


FIGURE 1-2 | MAP SHOWING LOCATION OF MINING LEASES AND MINERAL CLAIMS HELD SINCE THE 1980s (NOTE: MC 4421 AND MC4473 COVER THE SAME AREA)

Maximus commenced exploration beneath the historic BIH workings in 2005 and by 2008 had defined a combined Indicated and Inferred Resource containing 237,000 ounces of gold from 32 drillholes. The last published Resource by Maximus was in August 2008 Maximus: 598kt @ 12.3g/t containing 237,000 ounces of gold using polygonal method (2D).

Terramin commenced drilling the BIH deposit in 2016, which included 13 diamond drillholes in order to gain hydrological, geotechnical and metallurgical data about the BIH gold deposit to enable Terramin to progress the planning of underground mine design layouts of surface facilities. This included an additional 6 core holes and upgraded the resources from 237 000 ounces to 252 000 ounces of gold. Figure 1-3 shows the Terramin 2016 drillhole locations against the underground mine plan.

Table 1-5 outlines the holes which have been drilled since 1933 and up to the most recent drilling conducted by Terramin in 2018.



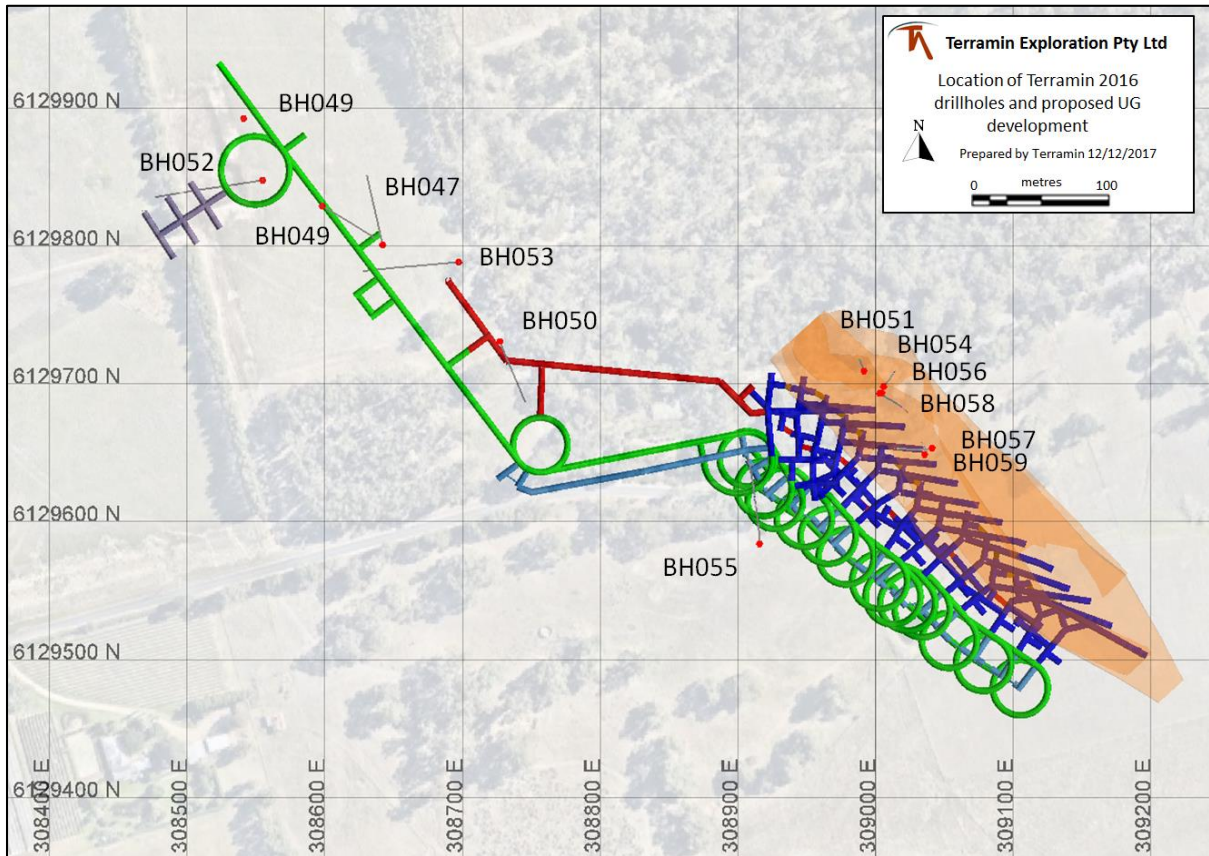


FIGURE 1-3 | 2016 TERRAMIN DRILLHOLES AND UNDERGROUND MINE PLAN

TABLE 1-5 | OVERVIEW OF EXISTING DRILLHOLES WITHIN THE PROPOSED ML

Company	Investigation	First Hole	Last Hole	Type	Meters	Started	Completed	Comment
Government	Bird-in-Hand	BH001	BH002	Diamond	370.5	1933	1934	
Government	Bird Extended	BH003	BH004	Diamond	259.1	1934	1934	
Government	Blackbird	BB001	BB004	Diamond	258.0	1941	1941	
Government	BiH tailings	BHT001	BHT035	Auger	85.0	30-Jun-82	30-Jun-82	
Capricorn	Bird Extended	BH005		RC	145.0	July 1997	July 1997	
Capricorn	Ridge	BH006	BH008	RC	222.0	July 1997	July 1997	
Capricorn	Bird-in-Hand	BH009	BH012	RC	571.0	July 1997	July 1997	
Capricorn	Blackbird	BH013	BH015	RC	190.0	July 1997	July 1997	
Maximums	Bird-in-Hand	BH016	BH044	Diamond	8146.8	08-Nov-05	02-Jul-08	Inc. BH028W
Maximums	Ridge	RDH001	RD002	Diamond	307.2	26-May-08	23-Jul-08	
Maximums	Bird Extended	BH045		Diamond	319.4	24-Jul-08	07-Sep-08	
Maximums	Bird-in-Hand	BH046		Diamond	299.2	07-Sep-08	30-Sep-08	

Company	Investigation	First Hole	Last Hole	Type	Meters	Started	Completed	Comment
Terramin	Hydrology	DWIB001	DWIB005	Open hole	1089.0	29-May-14	24-Jun-14	
Terramin	Decline geotech	BH047	BH050	Diamond	380.7	29-Feb-16	17-Mar-16	
Terramin	Bird-in-Hand	BH051		Diamond	190.6	15-Mar-16	30-Mar-16	
Terramin	Decline geotech	BH052	BH053	Diamond	252.2	18-Mar-16	01-Apr-16	
Terramin	Bird-in-Hand	BH054		Diamond	218.3	31-Mar-16	12-Apr-16	
Terramin	Decline geotech	BH055		Diamond	222.9	04-Apr-16	15-Apr-16	
Terramin	Bird-in-Hand	BH056	BH059	Diamond	941.1	15-Apr-16	20-May-16	
Terramin	BiH tailings	BHAUG001	BHAUG002	Auger	1.0	04-May-16	04-May-16	
Terramin	Baseline data	EBH01	EBH34	Auger	48.9	22-Nov-16	23-Nov-16	
Terramin	Baseline data	SED01	SED05	Auger	2.3	22-Nov-16	22-Nov-16	
Terramin	Baseline data	EBH35	EBH37	Auer	1.7	06-Sep-17	06-Sep-17	
Terramin	Hydrogeology	BHMB001	BHMB003	Open hole	414.0	23-Aug-18	19-Sep-18	Inc. BHMB002A
Terramin	Hydrogeology	BHRIB001	BHRIB002	Open hole	223.0	04-Sep-18	14-Sep-18	Reinjection bores

#### 1.4 OVERVIEW OF THE BIHGP

The proposed Project will see Terramin develop a small, high-grade gold mine beneath the historic BIH gold mine. The Project will involve:

- Construction of BIH site infrastructure development, estimated to take 12 months.
- Five years (includes the 12 months of site infrastructure development) “life of mine” based on the known BIH Resource.
- Underground mining by mechanised cut and fill.
- Ore being transported off site to Terramin’s existing AZM processing facility at Strathalbyn.
- Crushing and grinding of the ore at AZM followed by gravity separation and flotation to gold concentrate and possibly gold dore.
- Gold and silver products sold and freighted to domestic and international markets.

Although the deposit is small, the grade is extraordinarily rich which is unique to meso-thermal gold deposits. The concentrate to be produced will be high value with gold levels of approximately 170 grams per tonne gold and 80 grams per tonne silver. The concentrate will be sold to market for further beneficiation and refinement.

Benefits from the proposed BIHGP and reinstatement of the processing facilities at the AZM will include positive impacts to the community, with local spend and local employment policies, as well as positive impacts for both the broader regional and state economy, providing employment opportunities

through construction and operation, and economic diversification for the Adelaide Hills. This project has the opportunity to provide professional career paths for young South Australians, as well as provide family oriented mining opportunities close to Hills communities.

TABLE 1-6 | SOUTH AUSTRALIA'S MAJOR APPROVED MINES AND DEVELOPING PROJECTS: GOLD (VARIOUS SOURCES, 2018)

Project Name	Status	Total Resource & Ore Reserve	Contained Commodity (from Resource)	Actual or Proposed Annual Production
Barns – Andromeda Metals Ltd	JORC Resource	2.11 Mt at 1.6 g/t Au	107 000 oz Au	N/A
Bird in Hand – Terramin Australia Limited <a href="http://www.terramin.com.au">www.terramin.com.au</a>	Developing Mining Proposal	588 000 t at 13.3 g/t Au and 6.0 g/t Ag ASX release 10/08/16	252 000 oz Au ASX release 10/08/16	N/A
Challenger – WPG Resources Ltd <a href="http://www.wpgresources.com.au">www.wpgresources.com.au</a>	Care and Maintenance	838 000 Mt at 9.76 g/t Au ASX release 25/10/16 Ore Reserve 557 800 t at 4.98 g/t Au ASX release 25/10/16	343 299 oz Au ASX release 01/06/17 89 000 oz (reserve) ASX release 25/10/16	2016/17: 50 882 oz Au qtr rpt June 2017
Olympic Dam – BHP Ltd	Operating	Current status at 30 June 2018 Proved: 154 Mt at 0.68 g/tAu Probable: 346 Mt at 0.74 g/tAu		2018: 91 600 oz Au (BHP Annual Report)
Portia – Benagerie Gold Pty Ltd (100% subsidiary of Consolidated Mining and Civil (CMC), previously owned by Havilah Resources) <b>Error! Hyperlink reference not</b>	Care and Maintenance	720 000 t at 2.9 g/t Au Ore Reserve 53 200 oz Au (PEPR 17/12/2017)	67 000 oz Au	2016/17: 19 192 oz Au ASX Release 01/06/2017
Tarcoola – WPG Resources Ltd <a href="http://www.wpgresources.com.au">www.wpgresources.com.au</a>	Care and Maintenance	1 600 000 t at 1.7 g/t Au ASX Release 21/09/2017 Ore Reserve 567 200t at 3.0 g/t Au ASX Release 21/09/2017	87 600 oz Au ASX Release 04/02/15 54 300 oz Au ASX Release 04/02/15	2017: 69 439 oz Au qtr rpt June 2017.
Tunkillia – WPG Resources Ltd <a href="http://www.wpgresources.com.au">www.wpgresources.com.au</a>	Developing Mining Proposal	12.32 Mt at 1.41 g/t Au, 3.7 g/t Ag ASX Release 04/02/15	558 000 oz Au, 1.5 Moz Ag ASX Release 04/02/15	492 000 oz over 6 years ~70 000 ozpa
White Dam – Exco Resources Ltd <a href="http://www.whsp.com.au">www.whsp.com.au</a> Washington H. Soul Pattinson-owner (through subsidiary Exco)	Operating	5.42 Mt at 0.97 g/t Au website 11/08/2017 Ore Reserve 5.4 Mt at 1.04g/t gold	169 400 oz Au website 11/08/2017 181 000 oz Au (reserve) (PEPR 01/01/2012)	2016: ~2500 oz Au

## 1.5 OVERVIEW OF THE PROJECT SITE AND LOCALITY

The Adelaide Hills are part of the Mount Lofty Ranges, east of Adelaide, and cover approximately 800 km<sup>2</sup> stretching from just shy of Williamstown in the north, down to Prospect Hill in the South, and as far west as Harrogate and Brukunga. The Mount Lofty Ranges themselves, are part of the Adelaide Geosyncline stretch from the southernmost point of the Fleurieu Peninsula at Cape Jervis northwards for over 300 kilometres before petering out north of Peterborough. In the vicinity of Adelaide, they separate the Adelaide Plains from the extensive plains that surround the Murray River and stretch eastwards to Victoria. According to the Koeppen system of measuring climate, which is based on temperature and rainfall according to vegetation in the area, and has a temperate or Mediterranean climate, characterised by warm to hot summers and mild to cool, wet winters in the area (Peel MC, 2007). The combination of relatively high rainfall and hilly topography results in most of the rainfall occurring in winter. Woodside has an average annual rainfall of 814mm, and this predominantly occurs in the winter months.

As shown in Figure 1-4, the BIHGP is located approximately 2 km east of Woodside, in the Central zone of the Adelaide Hills.

Woodside is the primary regional centre in the Central Hills, with a population of approximately 2600, located between Lobethal, Balhannah and Charleston. The central Adelaide Hills includes everything from Lobethal to Mount Barker, and Belair to Kanmantoo, and includes the Onkaparinga Valley (Verdun, Balhannah, Oakbank, Woodside and Charleston). Woodside, to which the BIHGP is most closely located, home to local amenities including a medical centre, police, ambulance and country fire service stations, a local swimming pool, numerous churches and a recreation complex with netball courts, football oval, soccer pitches and bowls club. The Woodside Barracks (16<sup>th</sup> Air Land Regiment) is located in nearby Inverbrackie. The town is surrounded by agricultural pursuits, including beef cattle, dairies, and horticulture including orchards and vineyards, with the occasional berry growing operation.



FIGURE 1-4 | BIRD IN HAND GOLD PROJECT LOCATION

## 1.6 ENVIRONMENTAL POLICY

Terramin recognises that protection of the environment, including formal compliance with all regulatory requirements, is an integral component of an efficient and sustainable business. Terramin is committed to meeting all applicable laws, regulatory requirements and relevant standards and to respect and reflect the concerns of the broader community.

To achieve this, Terramin will:

- Engage in practices that help protect, preserve and enhance the environment;
- Apply standards that meet all relevant legislation and regulatory requirements as a minimum;
- Communicate in a transparent manner and consult with the community statutory bodies and all stakeholders about the Company's activities and projects;
- Integrate environmental issues into the decision-making process of the Company's operations;
- Manage environmental risks on a site-specific basis to achieve planned environmental outcomes;
- Establish and maintain operational and management systems to achieve a high level of environmental performance based on accepted science;
- Managing our operational areas in accordance with contemporary land management principles;
- Use resources and energy efficiently and minimise waste, emissions and negative external impacts;
- Recycle, reuse and reduce consumable products, and participate in initiatives to achieve environmentally beneficial outcomes;
- Give due consideration to environmentally advantageous alternatives when sourcing and using consumable products; and
- Establish and implement processes, practices and procedures for corrective and preventative actions to minimise the environmental risk and impact of the Company's activities.

All levels of management will lead by example to ensure that this policy, for the attainment of environmentally sound and sustainable practices, is implemented and maintained.

## 1.7 COMMUNITY POLICY

At Terramin we recognise that achieving positive relationships within the communities in which we operate is imperative in conducting responsible business. We also recognise that it is vital to inform, consult, involve and collaborate with the local communities to work towards beneficial outcomes and continually strive to secure our social license to operate.

To achieve this, Terramin will apply the following principles:

- Be open and transparent and engage in all dealings with communities;
- Ensuring employees and agents of the Company engage with stakeholders in a way which fosters mutual respect and trust between the company and the local communities in line with leading industry practice;
- Commit to developing long term partnerships that are suitably beneficial for both parties;
- Ensure the communities obtain a fair share in the benefits generated by a development through employment and business development opportunities; and
- Adhere to the laws and regulations applicable to its projects.

These principles are included in the standards, policies and procedures used by Terramin to operate its projects.

## 1.8 STATUTORY APPROVALS PROCESS

The application for the BIHGP is subject to a range of Commonwealth and South Australian legislative controls and government regulatory approval processes, which are discussed in greater detail in Chapter 4. The following sections provide a brief overview.

### 1.8.1 SOUTH AUSTRALIAN GOVERNMENT APPROVALS

MC 4473 was registered to Terramin on the 28<sup>th</sup> May 2019, over an area of approximately 195.5 Ha. The proposed application for a ML is within this area.

MC 4473 lies primarily within EL 5469, however, the southernmost corner lies within EL 5568, both held by Terramin. Terramin has entered into a written agreements with itself under section 80 of the Mining Act, whereby consent is provided for the pegging, lodging and registration of the MC and the application for and granting of, a ML over that MC. The written agreement also sets out the terms for any subsequent transfer or sale of either of the ELs.

Approval for the proposed mine is being sought under the Mining Act which is regulated by the South Australian Department for Energy and Mining (DEM) on behalf of the Minister for Energy and Mining (the Minister). Under the Mining Act, the proponent (Terramin) must be granted a ML and ensure that a Program for Environment Protection and Rehabilitation (PEPR) is in force before it can commence any mining operations. To be granted a ML, Terramin must submit an application accompanied by a MLP (this document), setting out the mining operations that are proposed to be carried out, the environmental impacts of those proposed mining operations, the environmental outcomes that are expected to occur and the results of any consultation undertaken in connection with the mining operations. This has been completed in accordance with the *Ministerial Determination for a Mining Proposal for the Bird in Hand Gold Project*, which describes the “minimum information required to be provided in a mining proposal and/or management plan for a mineral lease (ML) and any associated miscellaneous purposes licence (MPL) applications for a project incorporating the Bird in Hand Gold Deposit located in Woodside South Australia”. This Ministerial Determination (MD) was tailored for the BIHGP in accordance with Regulations 30(3) and 49(3) of the *Mining Regulations 2011*.

The MD requires amongst other things peer reviews of particular aspects of the Project. This includes control measures proposed to manage, limit or remedy groundwater impact events must be peer reviewed by a suitably qualified independent expert as required by the Ministerial Determination. Terramin have undertaken peer reviews on the grouting, the groundwater assessment, the managed aquifer recharge strategy and the site water balance. Peer reviewers were chosen for their qualifications and experience in the requisite areas. All peer reviewers qualifications are included in their respective reports.

In regards to the groundwater model, a final independent peer review report must include; an assessment of whether the model is fit for purpose, verification of model inputs, the results of the review of the model against Tables 9-1 and 9-2 of the Australian groundwater modelling guidelines (National Water Commission Waterlines Report Series No. 82, June 2012), the scope of the review and details of any actions undertaken as a consequence of the findings of the review. This has been completed by Innovative Groundwater Solutions during 2017, and again in 2019 with the updated groundwater model.

Lastly, the MD includes assessment of economic impacts on permissible land use which must be developed by a person who is suitably qualified and experienced in economic impact assessment. Information relating to permissible land use must be peer reviewed by a suitably qualified (experienced in economic impact assessment) independent expert. The scope of the review, the report arising from the review, and a report of any actions undertaken as a consequence of the findings of that review must be included as an appendix to the mining proposal. Peer reviews undertaken have been included in Table 1-7.

TABLE 1-7 | PEER REVIEWS UNDERTAKEN

Aspect	Report/Assessment	Peer Review
Grouting	Bird in Hand Gold Project – Grouting for Groundwater Control, Multigrout (Appendix H4)	Bird in Hand Gold Project – External Review – Proposed Grouting Programme, Golder Associates (Appendix H5)
Groundwater Model and Impact Assessment (including MAR modelling)	Groundwater Impact Assessment for the Bird in Hand Project, AGT (Appendix H1)	Outcomes of Peer Review of Bird in Hand Gold Project Groundwater Assessment Report, Innovative Groundwater Solutions (Appendix H2 and H3)
Site water balance	Water Balance, Terramin (Appendix K1)	Review of Mine Water Balance Model for BIH Project, Golder Associates (Appendix K2)
Managed Aquifer Recharge System	Managed Aquifer Recharge Investigation, Golder Associates, 2019 (Appendix H9)	Independent peer review of updated modelling for the Bird-in-Hand Gold Project, Innovative Groundwater Solutions Pty Ltd (IGS), 2019 (Appendix H10)
Water treatment proposal	Water Treatment Options Study, GPA, 2017 and 2019 (Appendix J1)	Water Treatment Options Study Peer Review, Golder Associates, 2017 (Appendix J2)
Economic Impacts on Permissible land use	Economic Impact of the Bird in Hand Gold Mine on South Australia and Regions, Economic Research Consultants (appendix W1)	Peer Review of ERC Economic Impact Analysis, South Australian Centre for Economic Studies, University of Adelaide (Appendix W2)

This Mining Lease Proposal has been reviewed internally by senior staff and has undergone external review against the Ministerial Determination by Resource and Environmental Projects Pty Ltd prior to submission of the draft in 2017, and again by GBS Consulting Pty Ltd in 2019 prior to formal submission. The Proposal has also been reviewed extensively by Terramin's CEO.

The BIHGP MD and a checklist against the MD is located in Appendix A1.

Once a ML has been granted, Terramin must only conduct the mining operations in accordance with the terms and conditions of the lease and in accordance with an approved PEPR. An appropriate environmental/rehabilitation bond will also need to be assessed and in place before any operations can commence.

This MLP provides comprehensive information to support the Mining Lease Application (MLA) (DEM Form 10), including a detailed description of the existing cultural, social, economic and natural environment and the proposed mining operations. This level of information is designed to assist stakeholders (including DEM and other Government agencies) to make an informed assessment about the risks and benefits associated with the proposed mine.

Approvals for the ancillary infrastructure required to support the BIHGP (specifically, the APF located at AZM) are being sought pursuant to Section 52 of the Mining Act, which allows the Minister to grant a MPL to any person in respect of mineral land for operating plant for the treatment of ore recovered in the course of mining operations. An MPL may be granted where the proposed activity will achieve better environmental outcomes if located outside the mining lease. Terramin believe that utilising the existing processing facilities and TSF provides better environmental outcomes for South Australia, than establishing a new processing plant and associated TSF. Using the Strathalbyn facility also provides an opportunity to employ a mix of both experienced former employees and younger local people to maximise the benefit to the Strathalbyn community. The local people directly employed will be 41, Terramin's local employment policy means contractors will either be locally based or sub-contract locally, with an expectation there will be significant local contractors engaged to modify or update the processing plant.

### 1.8.2 COMMONWEALTH APPROVALS

A referral of the proposed ML pursuant to Section 68 of the EPBC Act was made to the Commonwealth Department of the Environment and Energy on 20<sup>th</sup> October 2017, specifically in regards to a small population of *Caladenia Rigida* (>5) located in the Native Vegetation Heritage Agreement Area. *Caladenia Rigida*, or more commonly known as the Stiff White Spider Orchid, is listed as endangered under the EPBC Act. The proposed ML was declared to be not a controlled action on the 7<sup>th</sup> February by the Commonwealth. The EPBC letter from the Commonwealth of Australia is included in Appendix R3.

## 1.9 OBJECTIVES OF THE MINING LEASE APPLICATION

This MLP has been prepared in accordance with Section 35 of the Mining Act and Regulation 30 of the *Mining Regulations 2011* (SA), and subsequent BIHGP MD (gazetted on the 5<sup>th</sup> April 2017) and identifies and assesses the potential environmental, social and economic impacts and benefits of the proposed BIHGP. Mitigation and management strategies have been proposed where possible to minimise and avoid adverse impacts. The objective of this MLP is to demonstrate:

- That the BIH gold deposit can be 'effectively and efficiently mined';
- All potential environmental and social impacts, including benefits have been identified;



- The proposed level of impact (environmental outcomes) are acceptable given the economic and social benefits; and
- The proposed control strategies, set out as proposed outcome measurable and leading indicator criteria will achieve an acceptable level of impact for all identified environmental and social aspects considered.

This document has been prepared specifically in accordance with the BIHGP MD, which describes the “minimum information required to be provided in a mining proposal and/or management plan for a mineral lease (ML) and any associated miscellaneous purposes licence (MPL) applications for a project incorporating the Bird in Hand Gold Deposit located in Woodside South Australia”. This Determination was tailored for the BIHGP in accordance with Regulations 30(3) and 49(3) of the *Mining Regulations 2011*. **Appendix A2** outlines all authors who have contributed to completing this MLP.

## 1.10 DOCUMENT STRUCTURE

Terramin have structured this document in accordance with section 35 of the Mining Act and the subsequent tailored BIHGP MD so that:

- It is easily understood by all stakeholders;
- Demonstrates clearly how conclusions about impacts have been reached; and,
- Outlines any specific uncertainties or assumptions which are clearly identified in each section as relevant, rather than including a broad disclaimer on the reliability of information and conclusions.

Terramin have completed a checklist against the BIHGP MD which is included in Appendix A1.

This MLP has also been reviewed externally by GBS Consulting against the BIHGP MD, and feedback received has been incorporated into this submission.

**TABLE 1-8 | MLP STRUCTURE**

Contents	Pages
Declaration of Accuracy	
Chapter 1: Introduction	
Chapter 2: Description of the Existing Environment	
Chapter 3: Description of the Proposed Mining Operations	
Chapter 4: Statutory Framework	
Chapter 5: Stakeholder Consultation	
Chapter 6: Assessment Methodology – Impact Assessment	
Chapter 7: Public Safety	
Chapter 8: Traffic	
Chapter 9: Visual Amenity	
Chapter 10: Groundwater	
Chapter 11: Surface Water	
Chapter 12: Soil and Land	
Chapter 13: Existing Site Contamination	
Chapter 14: Geohazards and Geochemistry	
Chapter 15: Air Quality	
Chapter 16: Noise	
Chapter 17: Air-overpressure and Vibration	



Chapter 18: Native Fauna and Pest Species
Chapter 19: Vegetation and Weeds
Chapter 20: Aboriginal Heritage / Native Title and non-Aboriginal Heritage
Chapter 21: Land Tenure
Chapter 22: Agricultural Impacts
Chapter 23: Social Environment
Chapter 24: Economic
Glossary