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**EL19/2001**  
**ANNUAL REPORT, 2016**  
**KING ISLAND**  
**NW TASMANIA**

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**November 2016**

## **EXECUTIVE SUMMARY**

EL19/2001 is an integral component of the tenement package required for the development of the King Island Scheelite Project. The 66km<sup>2</sup> EL covers a 7km length of the prospective Grassy Group-Granodiorite contact. The EL hosts several significant deposits and exploration targets including the Bold Head Mine, Investigator 21 and Grassy West.

During 2015-2016, King Island Scheelite (KIS) continued with technical studies on the King Island Project. Additional technical work includes revision of the environmental impact statement, geotechnical investigation of the proposed 8-year pit, infrastructure engineering and marketing studies.

No work was completed specifically on EL19/2001 during the past year with all work focused on completing feasibility studies for the Dolphin Project.

The project work program for 2017 is scheduled to include:

- ML or RL application for the Bold Head Mine.
- Compilation of historic field data, interpretation and target generation of the Investigator 21, Grassy West and Bold Head South prospects.

An expenditure of approximately \$25,000 is expected for the 2017 reporting year.

It is envisaged that drill testing of targets will occur in the 2018 year following target generation.

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EL19/2001 Digital File Listing		
Exploration Work Type	Filename	File format
<b>Report</b>	EL192001_201612_01_Report.pdf	<i>pdf</i>
<b>Drilling</b>		
<b>Surface sampling</b>		
<b>Other (specify)</b>		
<b>File Verification Listing (<i>this file</i>)</b>	EL192001_201612_FileListing.xls	xls

## 1 INTRODUCTION

The King Island Scheelite Project is located in the southeastern corner of King Island, Tasmania (Figure 1). Project tenure includes a Mine Lease (1M/2006), and an Exploration Licenses (EL19/2001). The tenements are held by Australian Tungsten Pty Ltd, a wholly owned subsidiary of King Island Scheelite Limited (KIS) a public company listed on the Australian Securities Exchange.

The Dolphin Mine located on 1M/2006 was originally operated by Geopeko Ltd. along with the satellite Bold Head Mine located several kilometers to the north on EL19/2001.

The Dolphin Scheelite Mine operated intermittently since its discovery and start up in 1920 until the 1990's, with several forced shutdowns due to low tungsten prices. The Bold Head underground mine operated from 1972 until 1986. The site was decommissioned and rehabilitated in 1994 after low tungsten prices in the late 1980's forced closure of the operation.

KIS have been investigating the potential of re-opening the mines. Initial investigations into the viability of an open cut and seawall in 2006 were inconclusive and the focus changed to rehabilitation of the underground workings and production from remnant resources. KIS completed a definitive feasibility study into a 350ktpa mine and processing facility producing 5700t of concentrate per annum over an 11 year mine life in early 2012 from underground mines on the Dolphin and Bold Head deposits and retreatment of some of the tailings.

Project funding for the 2012 DFS proved to be difficult in the financial climate. Consequently, KIS have revised the project to a staged start up commencing with an 8 year open cut operation on the Dolphin Deposit producing 450ktpa. A gravity floatation concentration plant producing 4000tpa of 65% WO<sub>3</sub> forms the basis of the revised DFS.

Mine rehabilitation and mill construction are scheduled to commence within twelve months of securing full project funding.

Resource estimation of the Dolphin and Bold Head Deposits and historic tailings storage facility (TSF) have been completed by KIS and form the basis of the King Island Scheelite Project (Table 1, Callaghan, 2011, 2015a, Callaghan 2015b).

<b>TABLE 1. KING ISLAND SCHEELITE PROJECT RESOURCES</b>			
	<b>MTonnes</b>	<b>WO<sub>3</sub></b>	<b>Tonnes WO<sub>3</sub></b>
<b>Dolphin</b>	0.20% WO <sub>3</sub> cutoff		
Indicated	<b>9.60</b>	<b>0.9</b>	<b>86,400</b>
<b>Bold Head</b>	0.50% WO <sub>3</sub> cut off		
Indicated	1.61	0.92	14,810
Inferred	0.15	0.85	1,270
Total	<b>1.65</b>	<b>0.96</b>	<b>16,080</b>
<b>TSF</b>	0.08% WO <sub>3</sub> cut off		
Measured	<b>2.70</b>	<b>0.17</b>	<b>4,590</b>
<b>Total</b>	<b>13.95</b>	<b>0.77</b>	<b>107,070</b>

Various reserve estimations have been completed encompassing both open pit and underground options as well as retreatment of the historic Tailings Storage Facility. The most recent reserve estimation on the Dolphin deposit completed by Xenith consulting reported in accordance with the 2012 edition of the JORC Code consists of a Probable Reserve of 3.14Mt @ 0.73% WO<sub>3</sub> at a 0.2% WO<sub>3</sub> cut off. The Bold Head Reserve has not been updated post the recent 2015 resource estimation and remains as a Probable Reserve of 0.59Mt @ 0.76% WO<sub>3</sub> reported at a 0.5% WO<sub>3</sub> cutoff in accordance with the 2004 edition of the JORC Code (Fudge, 2012).

Technical studies associated with the project that have been completed or are in progress include:

- Resource estimation
- Mining studies
- Reserve estimation
- Metallurgical testwork
- Process flow sheet design
- Cost estimates and construction plans
- Environmental Permitting
- Negotiations with potential market off-taker
- Financial modeling
- Negotiations with potential project funding providers
- Geotechnical drilling

Studies completed on EL19/2001 over the life of the EL include diamond drilling, two Resource Estimations of Bold Head, two pit designs for Bold Head, Underground Reserve Estimation and Target generation.

EL19/2001 is integral to the development of the King Island Scheelite Project and is expected to add longevity to the project through exploration once operations recommence.

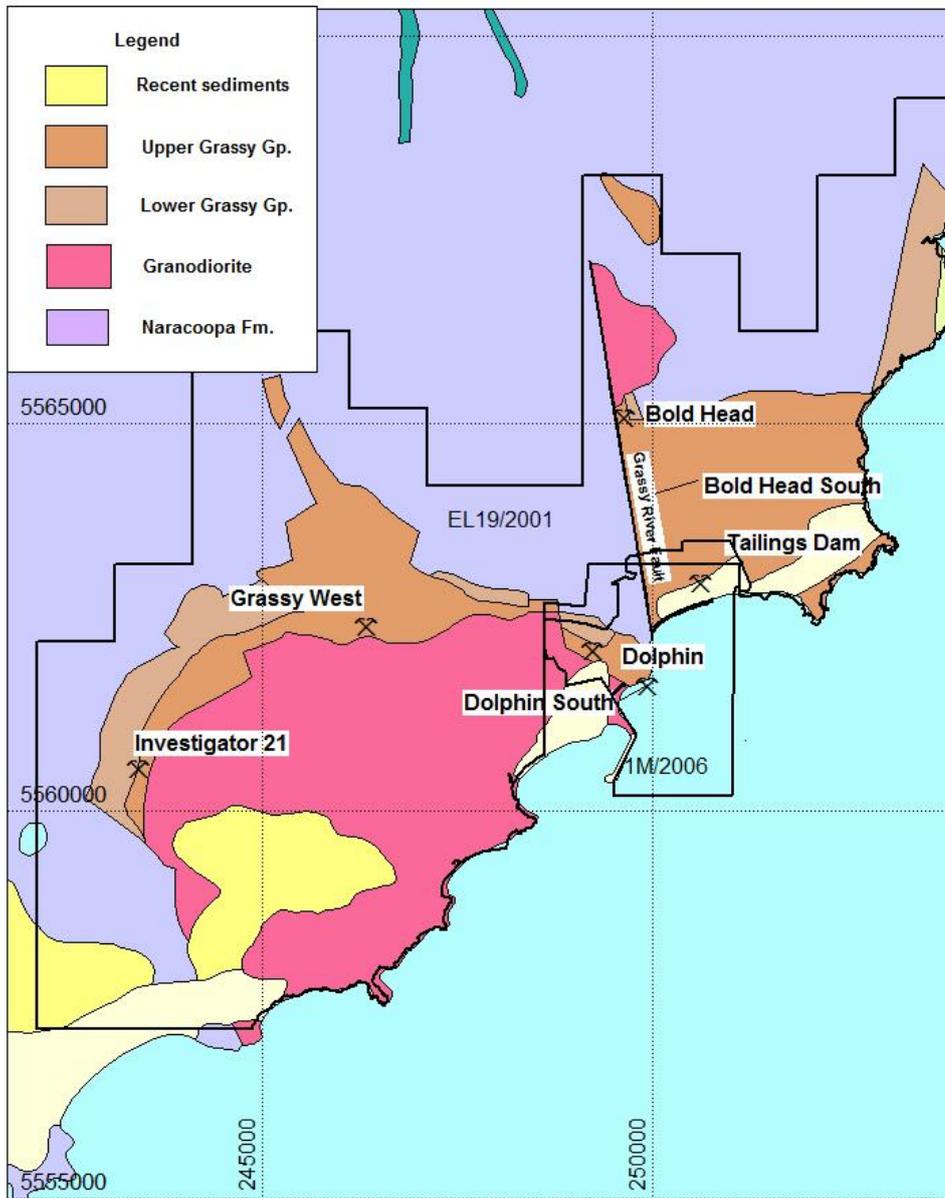


Figure 1. King Island Project Geology, Tenements and Major Prospects.

## 2 GEOLOGY

The regional geology of King Island is best described in Tasmanian Geological Record 2007/02, *Some Notes on the Geology of King Island* (Calver, 2007). Much of the geology described in this section is summarized from this publication (Figure 2).

The geology of King Island consists primarily of Proterozoic rocks with lesser Silurian Granites and extensive wind blown Pleistocene to Recent sand cover. The Proterozoic Geology of the eastern half of the island (hosting the Bold Head and Dolphin  $WO_3$  deposits) is distinctly different from the geology of the western half. The relationship between the western and eastern halves remains problematic.

The western half is dominated by the Mesoproterozoic (1300Ma) Surprise Bay Formation. The Surprise Bay Formation is dominantly a N-S striking regionally metamorphosed amphibolite grade meta-sedimentary unit with minor mafic intrusives. The western margin of the Surprise Bay Group was intruded by a 790Ma granite body (Calver, 2007) post dating the 760Ma Wickham Orogeny (Cox, 1989, Turner *et. al.* 1998).

The Eastern half of the Island is dominated by the (1000-750Ma) Fraser Formation consisting of a thick succession of relatively unmetamorphosed shale, siltstone and fine grained muscovite-quartz sandstone. Along the Southeast Coast the siltstone is conformably overlain by the 580Ma Grassy Group which is considered a correlate of the Togari Group in NW Tasmania, (Calver, 2007).

The Grassy Group in the City of Melbourne Bay area is well described by Calver (2007) and Meffre *et al* (2004). A summary of the Grassy Group stratigraphic sequence is described below:

**Cottons Breccia** - A basal unit of polymict cobble to boulder diamictite.

**Cumberland Creek Dolostone** - Calcareous sediments, shale with limestone/dolomite inter-beds. (Host Horizon for the King Island Scheelite Mineralisation).

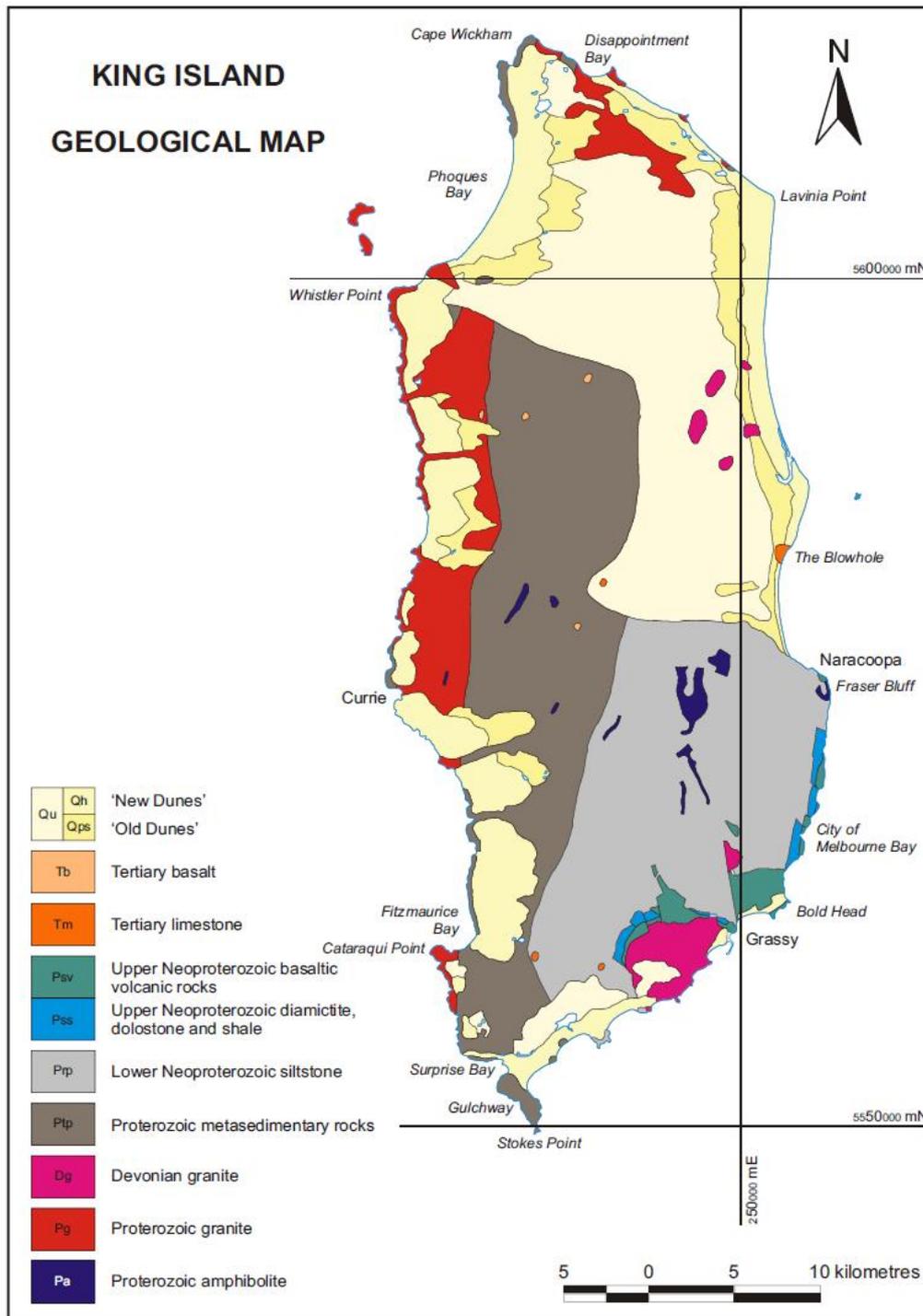
**Yarra Creek Shale** - Planar laminated shale with rare volcanoclastic interbeds.

**Grimes Intrusive Suite** - Gabbroic intrusive sills of andesitic composition.

**City of Melbourne Volcanics** - Tholeiitic pillow lava, peperite and volcanoclastic sandstone.

**Shower Drop Volcanics** – Picritic, high MgO pillow lava and hyaloclastite.

**Bold Head Volcanics** – Tholeiitic basalt, volcanoclastic sandstone and conglomerate.



**Figure 2. Regional Geology of King Island, (Calver 2007). Coordinates GDA94.**

Three granite bodies, the Grassy, Bold Head and Sea Elephant plutons intrude the Proterozoic sediments on the southeast coastline of King Island. The intrusions are classified as I-type monzogranite (Calver, 2007). The Bold Head Granite may be a sliver of the larger Grassy Granite ( $350.8 \pm 1.7$ Ma, Black et al), separated by the N-S trending Grassy River Fault (Figures 1 and 2).

The Bold Head Granite is porphyritic with large pink k-feldspar phenocrysts. The mineralogy consists of quartz, k-feldspar, plagioclase, biotite and amphibole with minor apatite, allanite, sphene, magnetite and zircon.

Scheelite skarn mineralisation has formed within the metamorphic aureole of the Bold Head and Grassy Granite plutons where they are in close proximity with the calcareous sediments and carbonates of the Lower Grassy Group Cumberland Creek Dolostone. Both the Bold Head and Grassy mineralisation is hosted in a similar stratigraphic sequence, although the carbonate units appear to be thicker in the Grassy area (Danielson, 1975, Figure 2). Mineralisation has formed by selective metasomatism, mainly within and immediately adjacent to carbonate horizons.

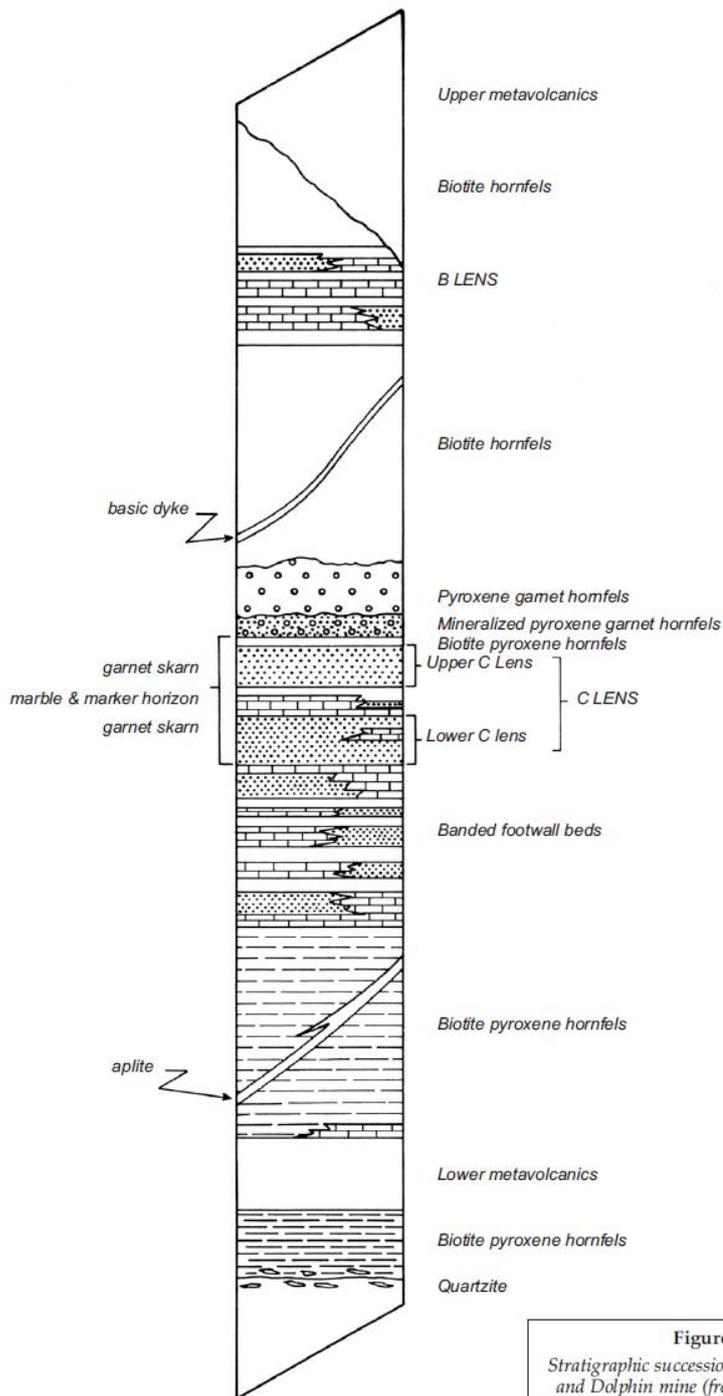
The deposits formed over a 100-200m sequence of complex skarn mineralogy located in the lower part of the Grassy Group, with two main host horizons known as B and C lens hosted in carbonates of 10-30m thickness separated by a similar thickness of skarn altered volcanic sediments. Mineralisation appears to have occurred where carbonates come into direct contact with the intrusion, or adjacent to brittle faults tapping into the nearby intrusion. Mineralisation grades increase towards major structures such as the Central, Decline and Grassy Faults at Grassy and the Number 2 and Boundary Faults at Bold Head.

Mine sequence rocks have been intensely contact metamorphosed and metasomatised and are described in Geopeko drill logs and maps by the resultant skarn mineralogy and not the stratigraphic protolith described in the regional geology. Geopeko logging codes include:

#### **DDH logging codes**

<b>Code</b>	<b>Geology</b>
um	Upper metavolcanics
bh	Biotite-actinolite hornfels
pbh	Pyroxene-biotite hornfels
pgh	Pyroxene-garnet hornfels banded pyroxene andradite skarn (+/- Scheelite)
gh	Garnet hornfels, andradite skarn (+/- Scheelite)
ch	Marble
bf	Banded footwall beds, interbedded marble and biotite-pyroxene grossularite skarn (+/- garnet, Scheelite)
lv	Lower metavolcanics

Mineralisation occurs predominantly as coarse Scheelite with lesser Powellite in either garnet-hornfels, pyroxene garnet hornfels and garnet-pyroxene altered banded footwall beds.



**Figure 4**  
 Stratigraphic succession, No. 1 Open Cut  
 and Dolphin mine (from Brown, 1990).

**Figure 3. Stratigraphic column of the Grassy Group host sequence in the Grassy open cut (from Brown, 1990). The sequence is very similar to the Bold Head sequence 3km north.**

### **3 WORK COMPLETED 2016**

Extensive test work and field programs have been completed on the King Island Project over the past 10 years. The revised project is based on the mining of an open pit producing 450ktpa of ore from a Probable Reserve of 3.14Mt @ 0.73% WO<sub>3</sub> over an 8 year period. The ore is to be processed in a crushing, grinding gravity flotation plant and laboratory studies suggest a recovery of 85% is possible. Total capital development is expected to be in the order of \$80M.

All work over the past year has focused on completing feasibility studies on the Dolphin Mine. Consequently, no technical studies were conducted specifically on EL19/2006 during 2016.

#### **4 EXPLORATION PROSPECTS EL19/2001.**

EL19/2001 hosts several advanced prospects including the Bold Head Mine, Investigator 21 and Grassy West as well as the conceptual South Bold Head prospect.

The Bold Head Mine is a significant component of the King Island Project. The Resource Estimation was remodeled and upgraded to comply with the guidelines of the 2012 edition of the JORC Code during 2015 (Callaghan, 2015) following a drilling campaign in 2014. A new Reserve Estimation and mine plan are required and should be included in future work programs. Mining is envisaged to involve some small scale open cut mining before re-accessing and rehabilitating the historic underground workings. Minor resource extensions are anticipated from exploration on the periphery of the Bold Head Resource. An ML or RL application should be submitted to ensure tenure.

EL19/2001 encompasses seven kilometers of Grassy Group volcanics exposed along the northern and western margin of the Grassy Granite (Figure 1). The area has significant potential to host similar scheelite skarn mineralisation as the Bold Head and Dolphin deposits. The two most advanced projects include Grassy West and Investigator 21, both of which have ore grade scheelite skarn intersections hosted in the same stratigraphic sequence as the Bold Head and Dolphin Deposits.

Detailed maps and sections of the granite contact were prepared by Geopeko based on field mapping, diamond drilling, percussion and auger drilling, geochemistry and geophysics (Brown 1975). All the data and maps are located as hard copy reports and figures based on the original ISG grid. The data requires collation, digitization, transformation to GDA format followed by geological modelling and targeting for follow up exploration drilling. The prospects have the potential to host Bold Head sized deposits (2-3Mt @ 0.8 – 1.0% WO<sub>3</sub>).

Also on EL19/2001 is the conceptual exploration target located at South Bold Head. The South Bold Head conceptual target has the capacity to host a large, Dolphin type scheelite deposit in the order of 2-10Mt. The exploration target is located south of the Graham's Road Fault along the eastern side of the Grassy Fault and as such should be regarded as high risk but with potentially high reward. The Graham's Road Fault is a ductile shear with a south-side down throw of over 200m. Mine sequence is postulated to occur at depth beneath the outcropping upper volcanics of the Grassy Group. Detailed geophysical surveys were completed in 1982 and reported in 1983 (Brown, 1983). Gravity surveys indicate several residual bouger anomaly highs and lows suggestive of a granite surface similar to the Bold Head setting. The presence of the upper volcanic sequence suggests there is the potential for a deep target (800m+) adjacent to the Grassy River Fault on its eastern margin.

It is recommended that all historic exploration data be collated, transformed and modeled to allow future exploration to be directed at high priority targets.

## **5 PROPOSED WORK 2017**

King Island Scheelite is focused on securing financing for the construction and commissioning of a scheelite concentration plant and mining operation based on resources located on Mine Lease 1M/2006. EL19/2001 is vital to the longevity of the operation containing significant resources and reserves at the Bold Head Mine as well as several drill defined Scheelite prospects on the periphery of the Grassy Granodiorite including the Investigator 21 and Grassy West prospects.

Historic data collation and targeting in preparation for future exploration drilling programs is proposed for 2017. A significant amount of exploration data and geological interpretation was created by Geopeko. The data is located as hard copy historic exploration reports, particularly Brown, (1975). Digitisation of all historic diamond, percussion and auger drilling from historic reports is recommended as well as digitization of interpretive maps and sections and their conversion to GDA94 format. Once the data has been digitized it will be followed up with geological modelling, field investigation and target generation.

The Bold Head Mine contains significant resources and an underground reserve. It is recommended that a retention license (RL) or Mining Lease (ML) is obtained for the Bold Head deposit to secure tenure while the Dolphin Mine is being developed.

The Reserve Estimation requires updating following the 2015 resource estimation.

The project work program for 2017 is scheduled to include:

- ML or RL application for the Bold Head Mine.
- Compilation of historic field data, interpretation and target generation of the Investigator 21, Grassy West and Bold Head South prospects.

It is envisaged that drill testing of targets will occur in the 2018 year following target generation.

## **6 PROPOSED BUDGET 2017**

A budget of approximately \$25,000 is proposed for the 2017 Annual year with most of the expenditure on compilation and validation of historic exploration data on the periphery of the Grassy Granite. Minor expenditure is expected for the lodgment of an RL or ML on the Bold Head Mine.

It is anticipated that drilling of exploration targets will occur in the summer of 2018.

## **7 ENVIRONMENTAL AND REHABILITATION**

No work was completed during 2016 and no rehabilitation is required. All drill sites were rehabilitated in 2015.

## **ADDITIONAL NOTES**

### ***COMPETENT PERSON AND JORC CODE***

The information within this report that relates to Mineral Resources and Reserves and Exploration Results is based on information compiled by Mr Tim Callaghan who is a consultant geologist working for King Island Scheelite. Tim is a Member of the Australasian Institute of Mining and Metallurgy (AUSIMM) and has sufficient experience in the styles of mineralisation and types of deposits in consideration to qualify as a competent person according to the 2004 edition of the Australasian Code for reporting Exploration Results, Mineral Resources and Ore Reserves (the JORC Code). He consents to the inclusion of this material in the form and context in which it appears in this report.

### ***FORWARD LOOKING STATEMENTS***

Some statements in this announcement regarding estimates or future events are forward-looking statements. They involve risk and uncertainties that could cause actual results to differ from estimated results. Forward looking statements include but are not limited to, statements concerning the Company's exploration program, outlook, target sizes and mineralised material estimates. They include statements preceded by words such as "expected", "planned", "target", "scheduled", "intends", "potential", "prospective" and similar expressions.

### **COORDINATES**

All coordinates in this report are recorded in AGD94 Zone 55 or Bold Head Mine Grid

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