

# HEG Limited

**HPA Project – high purity alumina is a critical component in high growth applications in LED lighting, Li batteries, electronics, optical and medical sectors**

**Existing high value gold projects**

# Disclaimer

## Forward Looking Statements Caution

This announcement contains forward-looking statements which are identified by words such as 'anticipates', 'forecasts', 'may', 'will', 'could', 'believes', 'estimates', 'targets', 'expects', 'plan' or 'intends' and other similar words that involve risks and uncertainties. Indications of, and guidelines or outlook on, future earnings, distributions or financial position or performance and targets, estimates and assumptions in respect of production, prices, operating costs, results, capital expenditures, reserves and resources are also forward-looking statements. These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions and estimates regarding future events and actions that, while considered reasonable as at the date of this announcement and are expected to take place, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies. Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of the Company, the directors and management. We cannot and do not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this announcement will actually occur and readers are cautioned not to place undue reliance on these forward-looking statements. These forward-looking statements are subject to various risk factors that could cause actual events or results to differ materially from the events or results estimated, expressed or anticipated in these statements.

## Competent Persons' Statement

The information in this announcement that relates to Hawkins Hill - Reward Mineral Resources and Exploration Target is based on information reviewed by Philip Bruce, for Red Hill and for Hargraves Mineral Resources and Mineral Resources underpinning the Hargraves Gold Mine Production Target and for Exploration results is based on information reviewed by Stuart Munroe and Philip Bruce. Dr Munroe is a Member of the Australasian Institute of Mining and Metallurgy and Mr Bruce is a Fellow of the Australasian Institute of Mining and Metallurgy and Mr Bruce is a full-time employee of HEG Limited. Dr Munroe and Mr Bruce have sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they are undertaking to qualify as Competent Persons as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (The JORC Code). Dr Munroe and Mr Bruce consent to the inclusion of the matters based on their information in the form and context in which it appears.

Mineral Resource information referred to for Hawkins Hill – Reward and for Big Nugget Hill was prepared and first disclosed under the JORC Code 2004. Except for the Big Nugget Hill North estimate (30.4.2013) these estimates have not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported. Similarly, for the other Mineral Resource estimates, there is no new information that materially affects the estimates and information provided in earlier referenced announcements and all material assumptions and technical parameters underpinning the mineral resources estimates in the relevant market announcements continue to apply and have not materially changed.

# Current HEG Snapshot

## Business Strategy

- Significantly increase value for shareholders
- Advance high value projects to production
- Acquire direct and indirect interests in resource projects at pre-development / production stage

## Projects

### **HIGH PURITY ALUMINA (+99.99% Al<sub>2</sub>O<sub>3</sub>:+4N HPA)**

- High grade kaolin tenements
- Targeting significant low cost HPA production
- Proposed production start in 2020/21

### **GOLD**

- 571,000 ounce resource
- Proposed initial production of 150,000 ounces
- Two open pit sites, simple metallurgy

## Market data

ASX code	HEG, HEGOC
Share Price	8.6 cents
52-week High	8.6 cents
52-week Low	2.5 cents
Issued Shares	103.2 M
Options (unlisted exp 30/7/20)	3.2 M at 7.5c
Options (unlisted exp 29/11/17)	1.5 M at \$1.25
Options (listed exp 30/7/20)	31.2 M at 7.5c
Market Capitalisation	~\$8.9 million
Cash and Shares	~\$0.5 million

## Top Shareholders

Sacco Developments	4.3%
Sangreal Investments	3.4%
Tell Corporation	3.3%
Sisu International	3.2%
Elstree Capital	2.9%
Citicorp Nominees	2.4%
Thea Management	2.3%
Kitara Investments	2.3%
JP Morgan Nominees	2.2%

# HEG Strategy Focus

**High Purity Alumina Project value is linked to high growth LED lighting and battery sectors**

**Both gold and HPA assets in HEG are significantly undervalued**

## **STRATEGY FOCUS**

- Completing feasibility studies for gold and HPA projects**
- Confirm HPA project as a significant low cost global supplier**
- Close offtake agreements for HPA**
- Decision on value proposition for gold projects**

# Board and Management

## Board

**Philip Bruce**, Chairman / MD: Company management, project development

**Graham Reveleigh**, Director: Technical, geology, resources

**Bill Condon**, Director: Business development, M&A, Hong Kong-based

**David Leavy**, Director: Financial markets, commodities, M&A

## Management

**Steve Peterson**, Chief Financial Officer: cross-jurisdictional transactions

**Kevin Lynn**, Company Secretary: multi-national funding, strategy

**Stuart Munroe**, Exploration Manager (SRK), global resources

**Mike Ware**, Project Manager (HPA geology), global resources

## HPA Consultants

**Tolga Kumova**, ex-Syrah Resources, marketing, product offtake

**Tom Eadie**, ex-Syrah Resources, geology, project development

**BHM Process**, HPA metallurgy, process parameters

**Mincore**, process design/construction, feasibility study

**SRK**, resource estimation

# HPA Project



- **Acquisition**
- **Strategy**
- **What is HPA**
- **Market**
- **Market players**
- **Kaolin tenements**
- **Initial work**
- **Development timeline**

# Acquisition of HPA Project

HEG Limited has acquired 100% of HPA Project, including high grade kaolin tenements and Pure Alumina Pty Ltd

- Terms of the purchase are:
  - ▣ HEG issues 8M shares and \$100k to vendors
  - ▣ Milestone share issues on completion of PFS, DFS and offtake
- Equity consideration aligns the vendors' objectives with HEG shareholders
- Vendors of HPA Project, Tom Eadie and Tolga Kumova will remain actively involved as the HPA development strategy is executed

# HEG HPA Strategy

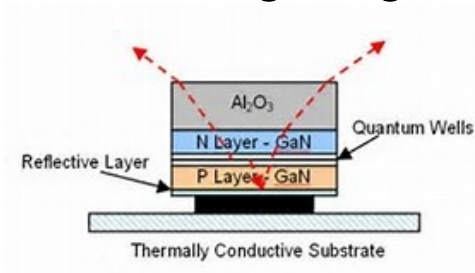
- The aim is to produce a significant proportion of global supply of +99.99% High Purity Alumina (HPA) from 100% owned kaolin deposits
  - **HEG/Pure Alumina aim to be one of the biggest producers of HPA globally**
- HPA production from HEG's kaolin feedstock is expected to provide a lowest quartile cost structure
  - **Initial test work indicates HEG's high quality kaolin feedstock and application of existing production techniques will provide very low operating costs**



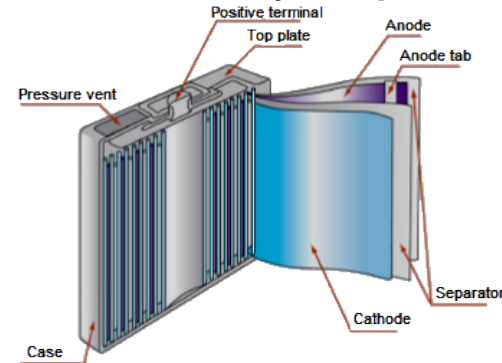
# What is High Purity Alumina (HPA)

- HPA has an  $\text{Al}_2\text{O}_3$  content of more than 99.99% ('4N')
- HPA is the base material for synthetic sapphire and used in:

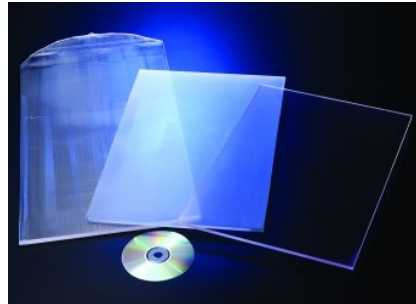
## LED lighting



## Lithium battery separator



Optical: high impact 'glass', phones, medical, military and electronics



# HPA Market

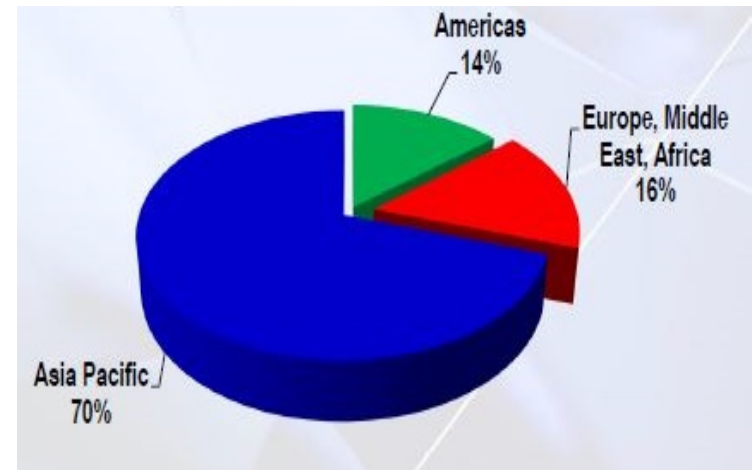
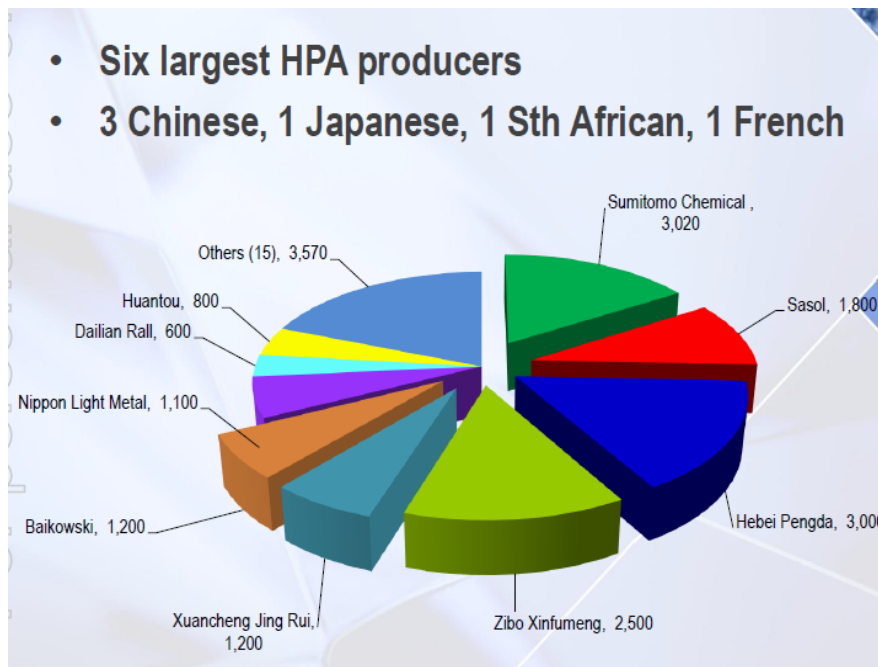
High growth market for HPA products:

- 4N : LEDs, Li batteries, storage capacitors (US\$15-20/kg)
- 4N-5N : electronics, medical (US\$20-30/kg) Benchmark 2015;  
Industrial Minerals 2017
- +5N : optical, aerospace (+US\$30/kg)
- Current market consumption of HPA is 25,300t (2016)
- Over 50% is used for LED lighting
- At forecast CAGR of 15-20%, HPA consumption in 2020 expected to be 46,000t and 86,800 tpa by 2024\* ATY / Persistence
- HEG targeting large proportion of global production of 4N+ HPA at low quartile costs starting in 2020/21

# HPA Market Players

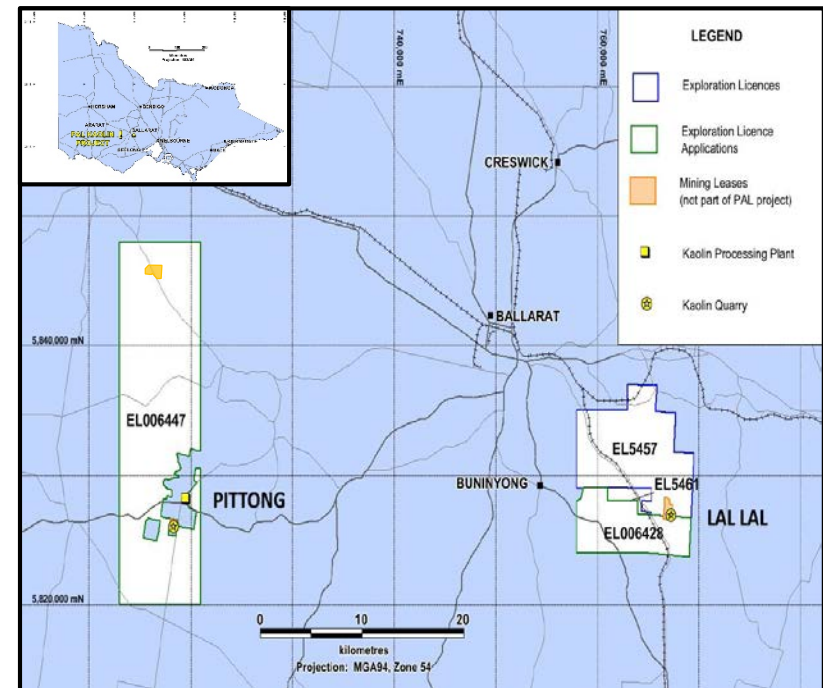
- Global HPA supply is fragmented with seven companies producing more than 1,000 tpa
- Most HPA production uses bauxite/ aluminium so operating costs US\$14-17/kg HPA
- Asia Pacific is the main consuming region for HPA, with North America and Europe accounting for the balance

- Six largest HPA producers
- 3 Chinese, 1 Japanese, 1 Sth African, 1 French



# HPA kaolin tenements

- 100% acquisition of high grade kaolin Exploration Licenses and applications at Lal Lal and Pittong, Victoria with extensive historical drilling and reports
- Previous drilling outlined extensive high grade kaolin deposits in 80's and 90's
- Drilling program completed for initial JORC 2012 resource
- Preliminary test work shows excellent kaolin beneficiation to high grade -53 micron fraction



# HPA Initial Work

- HEG completed a high level metallurgical study to:
  - ▣ Determine baseline metallurgical characteristics for HPA
  - ▣ Initial beneficiation process for kaolin
- Key findings were:
  - ▣ Kaolin beneficiation product of high mass yield at high recovery
  - ▣ -53 micron fraction has high kaolin content with low Fe and Ti
  - ▣ Simple HPA processing with high  $\text{Al}_2\text{O}_3$  recovery
- Current work
  - ▣ Yendon resource drilling completed
  - ▣ Beneficiation optimal size composite screening/assaying
  - ▣ Initial bulk sample HPA production

# HPA Development Timeline

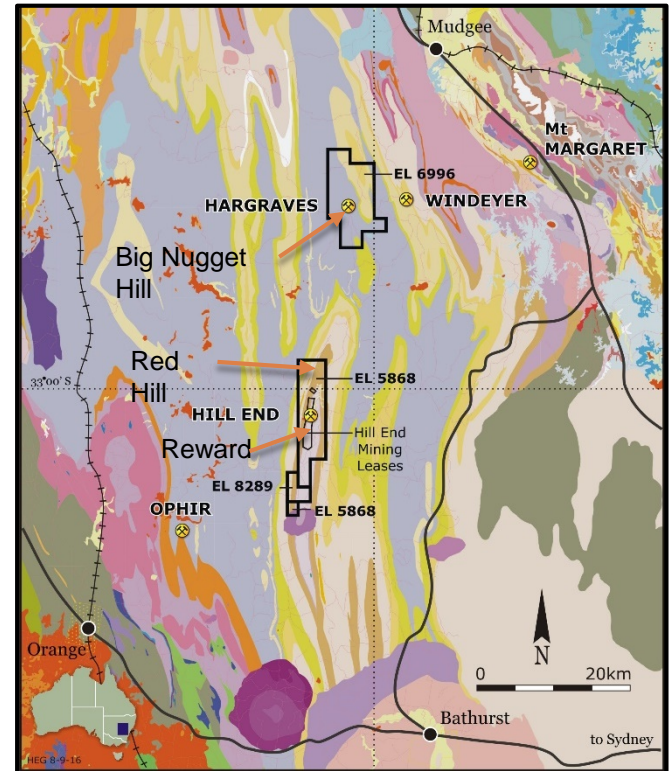
- Maiden JORC 2012 resource by November 2017
- Metallurgical test work to be completed by early 2018
- Complete Pre-Feasibility Study on project development, product marketing, HPA facility location and logistics in early 2018
- Complete Definitive Feasibility Study in mid-2019
- Finalise offtake arrangements for 100% of planned HPA production by mid 2019
- Financing complete and construction commences end 2019
- Commissioning and ramp up 2020 / 2021

# HEG Gold Projects

- **Gold projects**
- **Resources**
- **Hargraves Project**
- **Hargraves expansion**
- **Hill End Project**
- **Red Hill open pit project**
- **Reward Gold Mine**
- **Mares Nest**

# HEG Gold Projects

- ▶ Located in central NSW, Australia
- ▶ Total resources of 561,000 ounces in two near-production projects and existing mining infrastructure
- ▶ Hargraves Gold Project (EL6996 - 100%) PFS for 100,000 oz production from open pit / low impact processing project and ~\$40M net profit at \$1,600/ounce
- ▶ Red Hill Gold Project (EL5868 - min 85%) in preparation for PFS for open pit project with onsite plant or source for offsite plant
- ▶ Reward Gold Mine (various MLs - min 85%) has underground resources and existing bulk sampling gravity plant and requires drilling of wide near surface zone and modification of mining permits



HEG gold projects location



# Gold Resources\*

Initial resources mostly to the extent of drilling, potential for multiples

		Tonnes	Grade g/t gold	Contained gold oz
<b>Hargraves</b>				
Big Nugget Hill	Indicated	1,262,000	3.5	143,000
	Inferred	1,594,000	2.0	102,000
	<b>Sub-total</b>	<b>2,856,000</b>	<b>2.7</b>	<b>245,000</b>
<b>Hill End</b>				
Hawkins Hill – Reward	Measured	77,400	11.3	28,100
	Indicated	180,400	6.5	37,700
	Inferred	642,200	8.8	181,000
	<b>Sub-total</b>	<b>900,000</b>	<b>8.6</b>	<b>246,800</b>
Red Hill	Indicated	413,000	1.4	18,600
	Inferred	1,063,000	1.8	61,400
	<b>Sub-total</b>	<b>1,475,000</b>	<b>1.7</b>	<b>80,000</b>
<b>Total Hill End and Hargraves</b>	<b>Total</b>	<b>5,231,000</b>	<b>3.4</b>	<b>571,000</b>

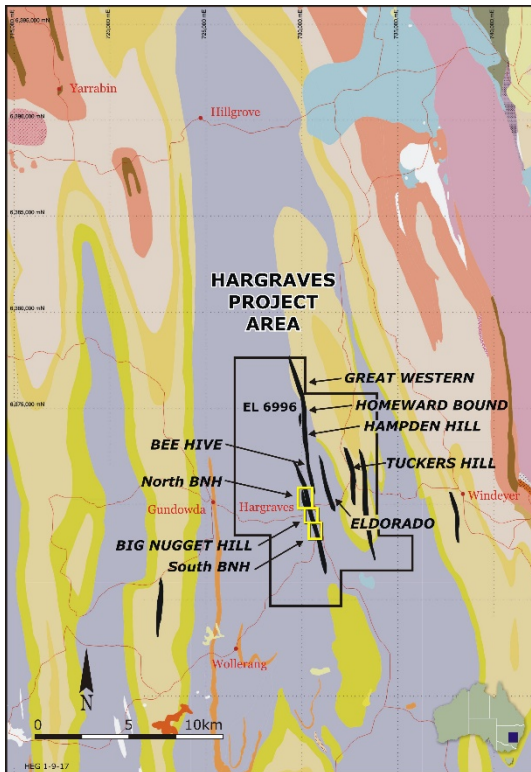
\*JORC 2004 compliant as at June 2015 except Red Hill JORC 2012  
Numbers include insignificant rounding errors

Cutoff grades: Big Nugget Hill  
Hawkins Hill-Reward  
Red Hill

0.5 g/t gold per block and inverse distance squared grade interpolation.  
1 g/t gold over minimum horizontal width of 1.1 metre and an inverse distance squared grade interpolation.  
1 g/t gold over minimum horizontal width of 0.8 metre.

# Hargraves Project (100%)

Permitting underway, high and fast return, good potential for expansion

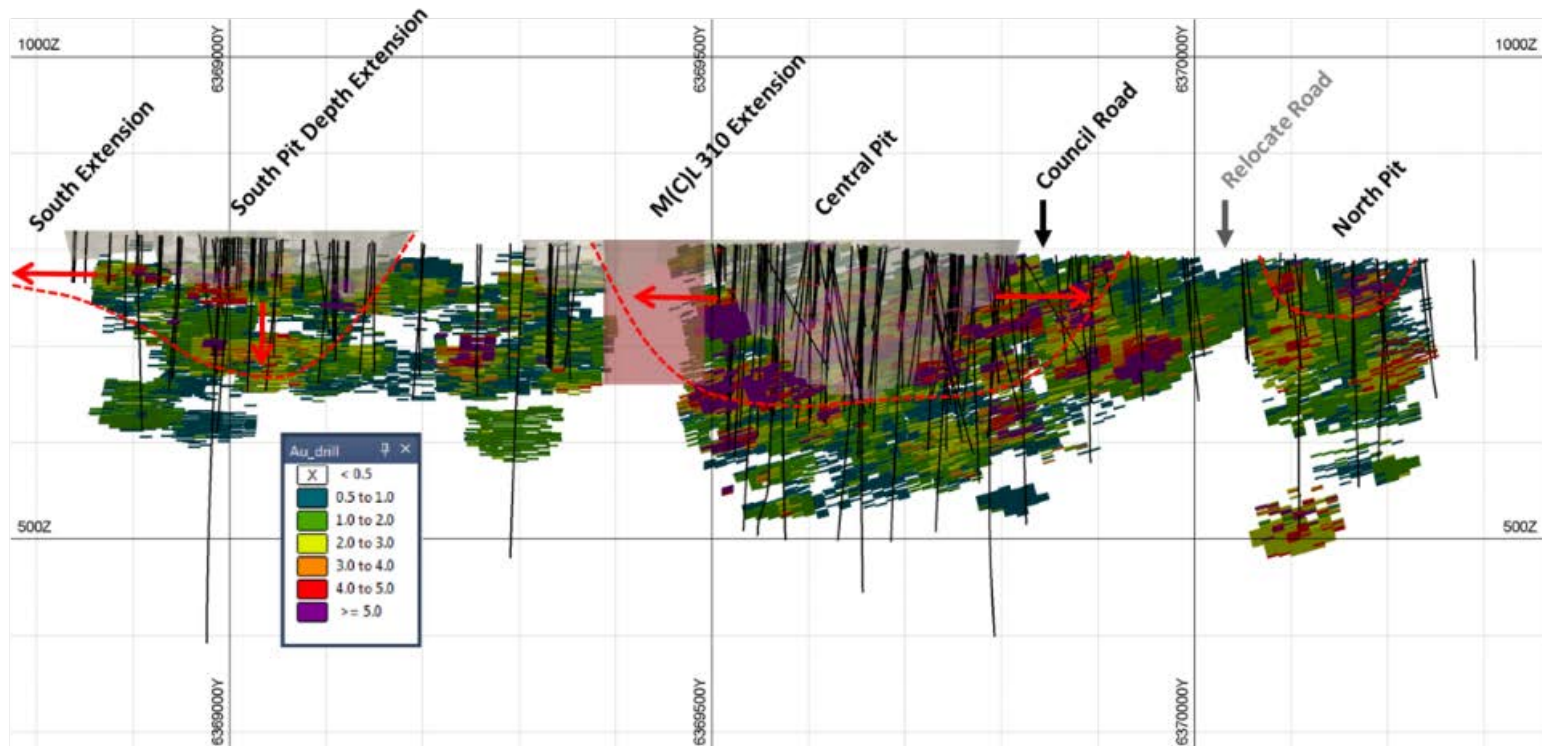


- Initial open pit potential at production rate of 300,000 tpa
- ~100,000 oz gold projected\* over 4 years at cash cost <A\$900/oz
- Pre-development cost of A\$2.3m and capital costs of A\$13.3m
- Payback of ~12 months at A\$1,600/oz (pit designs at A\$1,450/oz)
- Net profit of ~A\$40m after full cost recovery and royalty payments
- ~95% gold recovery to bullion / gravity concentrate
- PFS to be updated
- Potential for project extension at same production rate at depth, along strike and satellite deposits

\* Approximately 20% of the production target is based on inferred resources and there is a low level of geological confidence associated with inferred mineral resources and there is no certainty that further exploration work will result in the determination of indicated mineral resources or that the production target itself will be realised.

# Hargraves Expansion

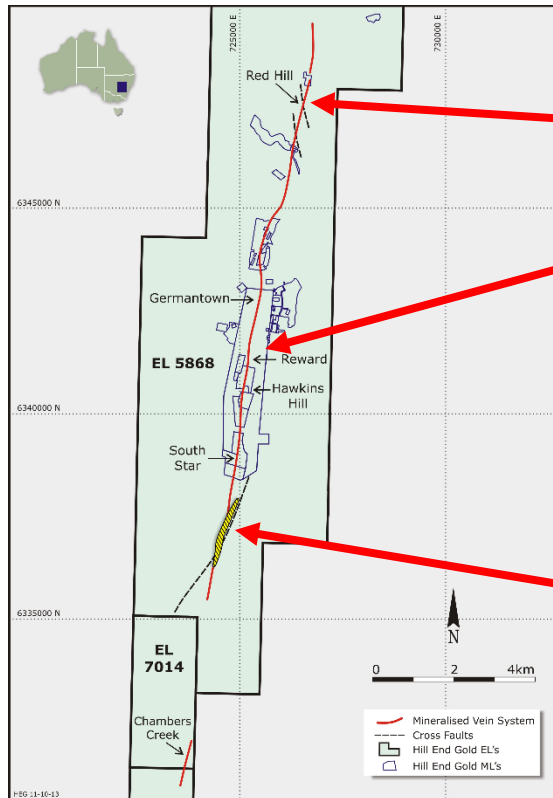
Project expansion likely at depth and along strike



- Drilling to 400m indicates that pit / underground extensions likely
- Between pits not yet drilled, and North BNH cut back or underground extension not yet included
- Satellite sources possible from Red Hill (Hill End) and Homeward Bound

# Hill End Project

Open pit pre-development, new and established prospects, underground upside

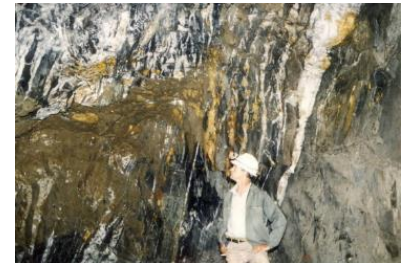


## Red Hill Project (EL5868 - min 85%):

- Economic Feasibility Study for ~50,000oz open pit project

## Reward Gold Mine (MLs - min 85%)

- Gravity plant and infrastructure in place
- Drilling proposed along 500m strike in wide near-surface part of deposit
- Proposed shallow underground project
- Ore may be transported off-site or relocate / upgrade plant

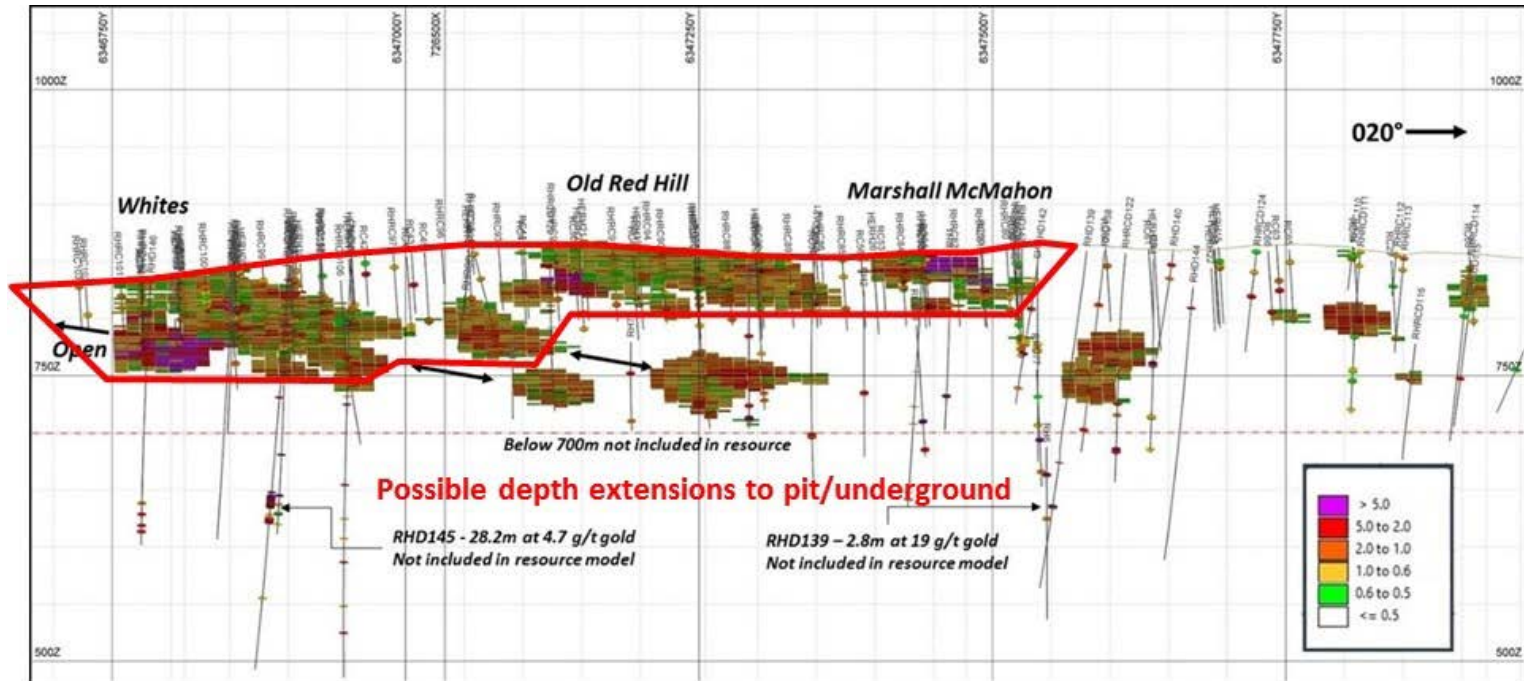


## Mares Nest Project (EL5868 - 100%):

- Drill program approved on wide target zone of 1.2km strike length

# Red Hill economic feasibility study

## Potential open pit project and underground upside



- Economic Feasibility Study to be completed
- Proposed stand-alone project or as satellite source
- Three pits then expansion as shown above or underground mine
- Simple metallurgy and high recovery gravity processing at low cost and environmental low impact

# Reward Gold Mine

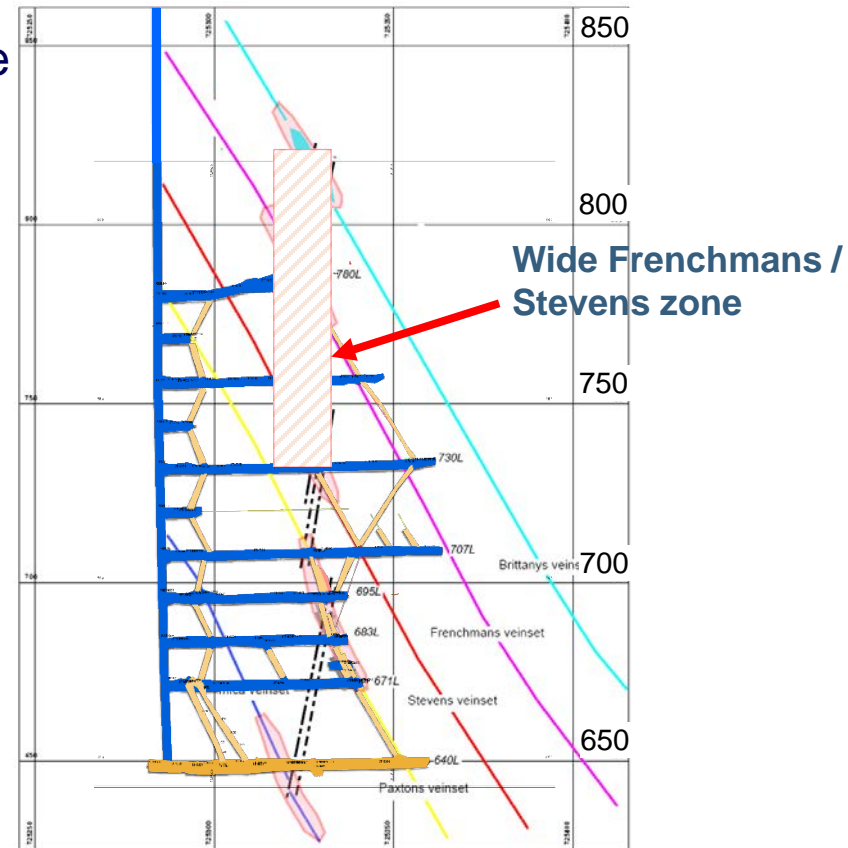
## Surface drilling proposed on Mining Lease

### Possible development

- Near surface wide zone: Frenchmans/Stevens
- Intersected in underground drilling and development
- Drilling of 500m strike extent
- Short development decline of 450m to top level

### Drilling into Frenchmans / Stevens wide zone :

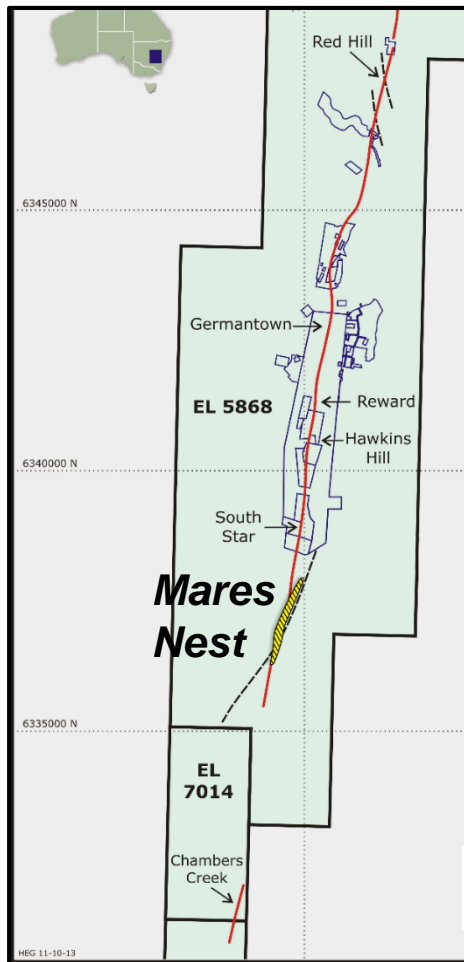
COV021	2.2m at 4.13 g/t
COV020	7.8m at 5.48 g/t
HHD15	2.3m at 30.8 g/t
HHUG057	7.1m at 11.2 g/t
COV024	6.8m at 2.62 g/t



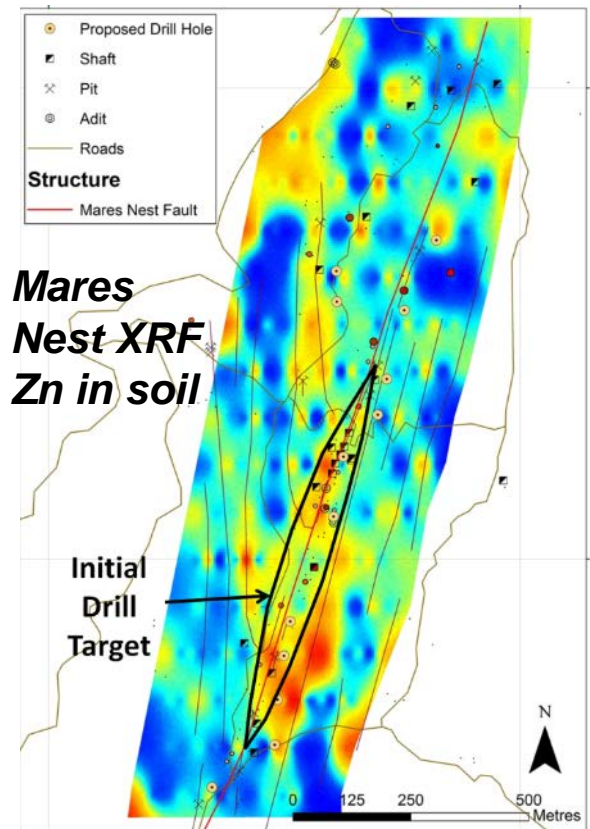
Cross section Reward Shaft workings

# Mares Nest Project

Excellent undrilled open pit situation, large mineralised area 3km south of Reward



- Mares Nest (HEG 100%) drill target established from mapping, rock chip sampling and soil geochemistry
- No drilling to date over extensive old workings
- Stand-alone open pit potential
- 4km x 0.5km mineralised zone - 1.2km drill program approved



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