

ASX Announcement

### Astron presents at Noosa Mining Investor Conference

Astron Corporation Limited (Astron, ASX: ATR) is pleased to announce that its Managing Director, Mr Tiger Brown, has been given the privilege of delivering the enclosed presentation to the Noosa Mining Investor Conference yesterday, Thursday, 20 July 2023.

A replay of Mr Brown's presentation can be found here:

Astron Noosa Mining Conference Presentation

This announcement is authorised by the Managing Director of Astron Corporation Limited.

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#### About Astron

Astron Corporation Limited (ASX: ATR) is an ASX listed company, with over 35 years of experience in mineral sands processing and downstream product development, as well as the marketing and sales of zircon and titanium dioxide products. Astron's prime focus is on the development of its large, long-life and attractive zircon assemblage Donald Rare Earth and Mineral Sands Project in regional Victoria. Donald has the ability to represent a new major source of global supply in mineral sands and rare earths. The company also conducts a mineral sands trading operation based in Shenyang, China; operates a zircon and titanium chemicals and metals research and facility in Yingkou, China; and is the owner of the Niafarang Mineral Sands Project in Senegal.



# **Donald Rare Earths & Mineral Sands Project**

Globally Significant, Tier-1 Australian Critical Minerals Project Multi-phase development pathway

Astron Corporation Limited (ASX:ATR) Noosa Presentation – July 2023

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#### **COMPETENT PERSONS STATEMENT**

The information in this report that relates to the MIN5532 Mineral Resource estimate is based on information and supporting documentation compiled by Mrs Christine Standing, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Mrs Standing is a full-time employee of Optiro Pty Ltd (Snowden Optiro) and is independent of Astron Corporation, the owner of the Mineral Resources. Mrs Standing 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'. The Company confirms that the form and context in which the Competent Persons' findings are presented have not materially modified from the relevant original market announcement.

The information in this document that relates to the estimation of the RL2002 and RL2003 Mineral Resources is based on information compiled by Mr Rod Webster, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy and Australian Institute of Geoscientists. Mr Webster is a full-time employee of AMC Consultants Pty Ltd and is independent of DMS, the owner of the Donald Project Mineral Resources. Mr Webster 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'. The Company confirms that the form and context in which the Competent Persons' findings are presented have not materially modified from the relevant original market announcement.

The information in this document that relates to the estimation of the Ore Reserves is based on information compiled by Mr Pier Federici, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Federici is a full-time employee of AMC Consultants Pty Ltd and is independent of Astron. Mr Federici 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'. The Company confirms that the form and context in which the Competent Persons' findings are presented have not prematurely modified from the relevant original market announcement.

The information in this document that relates to the metallurgical performance and outcomes of testwork is based on information compiled by Mr Ross McClelland, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy. Mr McClelland is the principal metallurgist and director of Metmac Services Pty Ltd. Mr McClelland has been involved with the metallurgical development of the Wimmera-style mineral sands resources for more than 30 years. He has provided metallurgical consultation services to DMS for more than 7 years. He qualifies as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. The Company confirms that the form and context in which the Competent Persons' findings are presented have not been prematurely modified from the relevant original market announcement.

## **Investment Highlights**



A multi-generational (50 years+) supplier of critical minerals and downstream valuable materials for decarbonisation

### Tier 1 project of global significance

3<sup>rd</sup> largest rare earth resource ex-China

Largest global zircon resource

# Compelling financial metrics and multi-phased approach

Phase 1 DFS:Phase 1+2 PFS:Post-tax NPV8 – A\$852mPost-tax NPV8 – A\$2.2bCashflow: Q3 2025Cashflow: Q4 2030

# Major approvals in hand, project technically de-risked

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EES, EPBC, CHMP,ExtensiveMining Licence grantedmetallurgical test work

# Favourable market dynamics across product mix

Rare earth demand growth – 6.0% CAGR

Zircon – short to mid term supply deficits

Focus on execution and value creation for shareholders

Experienced Management Team Clearly defined project timetable

### Significant future opportunities

Development of Jackson Deposit Further value-add opportunities

Site of Donald Project

# **Astron Corporation: Corporate Overview**



Astron's objective is to become a globally significant source of strategic minerals leveraging upon its unique resource position



# **Experienced Project Team To Deliver the Donald Project**

Highly experienced Board & Management team with extensive experience in corporate development



#### George Lloyd Chairman



#### Rong Kang Executive Director

Rong joined Astron in 1995 and has been a key contributor to the establishment of Astron's downstream processing and global marketing and sales activities, with a deep knowledge of the mineral sands product market and its key participants. Board member since 2012.

George has 30 years resource industry and corporate business development and finance

experience, including with RGC Limited, as well as serving as a senior executive and

director of a number of listed and unlisted companies with interests in industrial minerals,

base and precious metals, as well as energy sector.



#### **Gerard King A.M.** Non-Executive Director

Gerard is a former partner of Lavan & Walsh, which became Phillips Fox Perth. Experienced in commercial contracting, mining law and corporate and ASX compliance. A former member of the Australian Mining & Petroleum Lawyers Association Served as a non-executive director for several companies.



#### Dr Mark Elliott Non-Executive Director

Mark has 27 years experience in corporate roles, both as chairman and managing director on several ASX-listed and private companies. Involved in identifying and securing resource projects, capital raisings, marketing and completing commercial agreements, feasibility studies, mine development plans and their execution.



#### **Tiger Brown** *Managing Director*

Tiger joined Astron in 2018, holding various business development planning and executive roles in China and Australia prior to joining the board in 2019. Appointed managing director in February 2019 and has overseen the detailed planning for the commercialisation of the Donald project.

#### Sean Chelius

Donald Project Director

Sean jointed Astron in January 2022 as the Project Director for the Donald Mineral Sands and Rare Earth project. Sean has over 30 years international experience in mining project planning and implementation, including full responsibility for taking projects from concept through to commissioning and production. His experience involves project management and engineering roles in Australia, South Africa, Zimbabwe, Papua New Guinea and Fiji with BHP, Anglo American, Newcrest, Ausenco and Worley Parsons.



### Greg Bell

#### Chief Financial Officer

Greg's advisory and corporate experience spans more than 21 years, working initially in corporate advisory and assurance services with Deloitte, followed by 8 years with Mineral Deposits Limited (MDL) as Accounting Manager and then Chief Financial Officer. Subsequent to MDL, Greg held both consulting and executive roles with international mineral sands and resource companies, including in the critical minerals sector.

#### Jessica Reid General Manager Sustainability

Experienced environmental and social professional, working across Australia and PNG on natural resource and major infrastructure projects for over 18 years as Principal at Tetra Tech (formerly Coffey). Previous experience includes the delivery of Donald Project E.E.S. and Gippsland Renewable Energy Zone in VIC, environmental approvals for the Wafi-Golpu Project, Ok Tedi Mine Life Extension in PNG.



# The Donald Rare Earths & Mineral Sands Project

100% owned world class asset in supportive jurisdiction with key regulatory approvals in place



Located in the Wimmera Region, ~300kms to the NW of Melbourne, Approximately 70kms from the closest regional city of Horsham



Total licenced area of 426 km<sup>2</sup>, comprises of the Donald Deposit (MIN5532 and RL2002) and the Jackson Deposit (RL2003)



Only project of its type with positively assessed EES, a granted Mining Licence, federal government EPBC and Cultural Heritage Management Plan



Strong community support, executed MOU with local shire council



Mining planned on freehold land used for cropping and grazing, Minimal native vegetation impact, land for off-sets already purchased



Secured sufficient water rights for Phase 1 + Phase 2 development



### Bringing to Life a Globally Significant Rare Earths and Zircon Project

# ASTRON

#### Rare Earths - Relative In-situ Rare Earth Resource



 Selected ex-China producing and prospective rare earths projects with available resource data, based on publicly available information. Bar size denotes overall size of Total Rare Earth Oxide (TREO) equivalent resource. This assumes a conversion factor of 0.67 from Monazite and Xenotime to TREO.

### Mineral Sands - Relative In-situ Resource & Grade of Ti & Zr



- Selected prospective developing mineral sands projects with available mineral resource data, based on publicly available information. Metallurgical assemblages are converted from optical assemblages. ZrO<sub>2</sub>% is calculated as a percentage of overall ore. Bubble size denotes overall size of zircon-equivalent resource.
- Astron Corporation's Mineral Resource Information derived from ASX announcement, 1 December 2022, Donald Rare Earth and Mineral Sands Project – Mining Licence Mineral Resource Update.

# **Phased Approach to Long Term Value Delivery**

Unparalleled resource position enables phased development, with multiple independent value-chains



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# **The Donald Project - Phase 1**

Dual revenue stream underwritten by conventional mining operations and proven process flowsheet



Conventional and proven flowsheet high valuable heavy mineral recovery



Truck and excavator mining on free-flowing sand minimal induration



Fine-grained recovery spirals developed in 2000s, in commercial use at >15 sites globally



>8ktpa of REEC over first 5 years of Phase 1, >60% TREO, >20% Nd/Pr, >2% Dy /Tb



>250ktpa of HMC over first 5 years of Phase 1, over 95% HM,  $\sim$ 37% TiO<sub>2</sub>,  $\sim$ 20% ZrO<sub>2</sub>



1,000t test-pit successfully excavated and rehabilitated to farmland with good crop yields



**Concentrate Upgrade Plant** 

# **Definitive Timetable to Phase 1 Production + Cashflow**

Supported by Advanced Regulatory Approvals and Extensive Engineering Test-work and De-risking

Advanced Regulatory Approval Status											
Key Approval Requirement	Completed	Date	Expiry								
Environmental Effects Statement	$\checkmark$	2008	N/A								
EPBC (federal)	$\checkmark$	Mar-09	2034								
Cultural Heritage Management Plan	$\checkmark$	Jan-14	Life of mine								
Mining Licence - MIN5532	$\checkmark$	Aug-10	Aug-30								
Water Rights <sup>1</sup>	$\checkmark$	Jan-12	Jan-41								
Radiation Licence <sup>2</sup>	$\checkmark$	Dec-20	Dec-23								
Work Plan	Pending	Target EOY 2023	Life of mine								

### Significant Pilot Scale Test Work Complete



### WCP Pilot Plant, Queensland, 2019

1,000 tonnes of ore was processed using full-scale spirals, achieving high recoveries to a high-grade HMC Product with >95% heavy mineral grade



### CUP Pilot Plant, Western Australia, 2021

Eight tonnes of HMC produced from Donald ore was separated into a highquality REEC, with >60% TREO

### Phase 1 Development Timetable





- Water Rights include a 6.975 GL water entitlement purchased with option to renewal from GWM Water in 2012 for A\$17m, sufficient for Phase 1 & Phase 2.
- 2. Radiation Licence was first issued in 2014 and have since been renewed periodically.

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### **Environmental Management, Rehabilitation and Sustainable Development**



Minimise environmental impact through sustainable mining & rehabilitation, assisting Astron's social license



Products are critical in assisting the energy transition



Donald represents an auditable source of rare earth minerals from an ESG-standpoint



Mining operations to be undertaken on cleared land, predominantly used for cropping



Mined land to be rehabilitated within 3 to 5 years of excavation. Demonstrated through successful test-pit



Recycling of process water, no surface water run-off, and groundwater is hyper-saline (non-potable)



Commitment to explore renewable energy use during production







#### 4. Rehabilitation



# **The Donald Project - Phase 2**

Duplication of mining throughput and the production of final mineral sands products



Equity component of Phase 2 Capex to be funded through internally generated cashflows



PFS demonstrates incremental NPV of \$1.4B Extending mine-life to 58 years



Extensive evaluation in engineering design, pilot-scale test work for MSP undertaken demonstrating commercial recoveries



The production of final mineral sands products facilitates access to a more global market



Average >13,000tpa of REEC, ~95,000tpa of zircon, 260,000tpa of titanium feedstock



Construction is projected to start in 2029, commissioning forecast towards Q4 2030

Phase 2B - Process Flow Diagram



# **Rare Earth Element Concentrate Market Tailwinds**

Globally significant Western rare earth supply at a time of increasing product demand



Source: Adamas Intelligence, data as at Q1 2023

**Rare Earth element applications** 



Wind turbines



Battery alloys



Solar arrays



Electric vehicles



# Mineral Sands – Market Supply Issues

New long-life supply essential as traditional stalwart sources of supply mature



Global Titanium Feedstock Supply Demand Balance: 2010–2030 12,000 Likely new supply — Underlying demand Existing supply 10,000 \$100 I 000, \$100 I Titanium Minerals 2,000 0 2010 2012 2024f 2028f 2030f 2014 2016 2018 2020 2022f 2026f

#### Major product applications



Ceramics, kitchen, sanitaryware



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Casting and foundry applications



Paint and pigment production



Aerospace and industrials



### **Further Information**



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### Joshua Theunissen Company Secretary

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# **Appendix: Phase 1 & 2 Combined Financials**

Robust financial metrics deliver long-life, sustainable cash flows to drive shareholder value

Reserves	REEC	Zircon	Capital expenditure breakdown (\$Am)	Phase 1	Phase 2a	Phase 2b	Combined Phase 2
	Production	Production	Mining Unit Plant	20.5	20.5	-	20.5
~~~~	12 Oktop	03 5ktpa	Wet Concentrator Plant	70.0	70.0	-	70.0
825Mt @ 4.5% HM	51% of revenue	33% of revenue	Concentrate Upgrade Plant	38.1	38.1	-	38.1
	5170 Of Tevenide		Mineral Separation Plant	-	-	65.3	65.3
Revenue	Cash Costs	FRITDA	On-site non-process infrastructure (on- site road, electricity and water upgrades)	33.6	31.4	4.8	36.5
Revenue	00311 00313	LUIIUA	Overhead 66kv powerline supply	27.6	5.3	-	5.3
<b>*~70</b>	<b>ФО4 Г</b>	¢000	Water supply upgrade	11.9	33.5	-	33.5
\$0/8M	\$315M	\$303M	Off-site road upgrades	13.9	-	-	-
per year	per year	per year	Other off-site infrastructure	10.0	1.6	-	1.6
CADEX	Minalifo	Doct-Tax IDD	Project engineering and technical services	47.9	75.9	15.6	91.5
CAPLA			Construction Indirects	26.9	27.5	16.3	43.8
Phase 2a Phase 2b			Other	25.0	47.5	1.4	48.9
432m \$134m	58 years	30.3%	Contingency <sup>1</sup>	39.2	79.8	31.0	110.8
	•		Total	364.7	431.4	134.4	565.8

1. Contingency for Phase 1 is estimated at 12%. Contingency for Phase 2a and 2b is estimated to be 23.3%. Both contingency estimates have been based on a risk-based approach to each capital expenditure area including potential for changes in current design and/or key infrastructure.

Note: Unless otherwise stated, all dollar values are expressed in real Q1 2023 Australian Dollars

For further information, see ASX Announcement, RL2002 Ore Reserve Update & Project Financial Update, 26 June 2023



# **Experienced Project Team To Deliver the Donald Project**



### Highly experienced Board & Management team with extensive experience in corporate development

SNOWDEN Optiro

Formerly responsible for corporate development and exploration at RGC Limited, overseeing the merger of RGC and Westralian Sands Limited to form Iluka and negotiation of the Mining Area C Royalty with BHP (now Deterra), Chairman of global engineering services group Ausenco, bauxite development company VBX Limited, and Chairman of the Senior Advisory Board of AWR Lloyd, a specialist strategy and M&A advisory firm focused on the Indo-Pacific region.
Joined Astron in 2018, holding various business development planning and executive roles in China and Australia prior to joining the board in 2019. Appointed Managing Director in February 2021 and has overseen the detailed planning for the commercialisation of the Donald project.
A key contributor to the establishment of Astron's historic downstream processing and global marketing and sales activities, overseeing the sale of Astron's downstream assets to Imerys S.A. for \$200m. Kang has an extensive knowledge of the mineral sands product market and its key participants.
Former Partner of Lavan & Walsh, which became Phillips Fox Perth. Experienced in commercial contracting, mining law and corporate and ASX compliance. A former member of the Australian Mining & Petroleum Lawyers Association, as well as serving as a Non-Executive Director for several companies.
Appointed to the Board January 2021. A Geologist with extensive experience in the resource sector. Over 30 years experience in corporate roles, such as Chairman or Managing Director on a number of ASX- listed and private companies including, Zirtanium Ltd which secured the Donald and Jackson deposits after they were relinquished by Rio Tinto. Associated with identifying and securing resource projects, capital raisings, marketing and completing commercial agreements, feasibility studies, mine development and project execution.
Over 21 years of advisory and corporate experience, initially at Deloitte, followed by 8 years with Mineral Deposits Limited (MDL) as Accounting Manager and then Chief Financial Officer. Subsequently, consulting and executive roles with international mineral sands and resource companies, including in the critical minerals sector with TiZir and Tiger Resources.
Over 30 years' experience in mining project planning and implementation, including full responsibility for taking projects from concept through to commissioning and production. Experience includes project management and engineering roles with BHP, Anglo American, Newcrest, Ausenco, including the delivery of Unki greenfield development in Zimbabwe, expansion of anglo-platinum refinery and the first autonomous haulage in coal with BMA.
Experienced environmental and social professional, working across Australia and PNG on natural resource and major infrastructure projects for over 18 years as Principal at Tetra Tech (formerly Coffey). Previous experience includes the delivery of Donald Project E.E.S. and Gippsland Renewable Energy Zone in VIC, environmental approvals for the Wafi-Golpu Project, Ok Tedi Mine Life Extension in PNG.
Multi-decade experience in mineral sands mining including Technical Services Manager at Iluka's Jacinth Ambrosia and WRP.
Over 30 years of working on fine mineral recovery technogies, dating back to Wimmera Industrial Minerals in 1990s, and subsequently at QIT, highly skilled Metallurgist, having worked across a broad spectrum of mineral projects
Experienced Geologist, previously mine geologist for Iluka Resource's Ouyen Project, with hard rock experience at Ballarat Goldfields, Kirkland Lake and Newmarket Gold.

ATC Williams MydroGeoLogic 🥥 W3 Plus Consulting 🥝



Mineral Technologies

AMC

consultants



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# **Appendix: Cash Flow Profile**



Robust financial metrics deliver long-life, sustainable cash flows to drive shareholder value



#### REEC pricing assumptions are derived from Adamas Intelligence forecasts and are calculated as a percentage of the basket value.

- Astron's REEC product contains significant heavy rare earth elements resulting in a pricing advantage over its peers.
- Astron has used exclusive of Chinese VAT (13%) pricing for its pricing assumption in relation to its REEC forecast for its base case and low case to be conservative. The upside case is inclusive of Chinese VAT. Astron plans to align itself with Australian Critical Minerals Strategy – target western processors for its REEC product.
- Mineral Sands product pricing assumptions, including HMC, premium zircon, chemical zircon, titanium feedstock are derived from TZMI forecasts, or formulas supplied by TZMI
- NPV is also sensitive to movements in operating costs and mineral recoveries - however, the operating cost estimate has been derived on a first principle basis by independent experts and benchmarked against other similar projects. Mineral recoveries assumptions are based on extensive metallurgical test work completed on a pilot plant scale using bulk samples representative of the actual mine path

# **Appendix: Sensitivity Analysis**

Sensitivity analysis illustrates robust financial metrics able to withstand cyclical downturns

#### Sensitivity analysis shows that even with large movements in the key variables, the Project returns a very attractive Post-tax NPV. Pricing Deck - Rare Earths (Low/High) 1,884 The analysis illustrates the Donald Project's robustness and its ability to weather major commodity cycles through its attributes of long Discount rate (9%/7%) 1.885 mine life and having a dual revenue stream. AUD : USD used (75c/65c) 1,919

2.670 2,599 Recoveries (Low/High) 2,502 1.968 Flex - Opex (+10%/-10%) 2,022 2,448 Flex - Mining (+10%/-10%) 2,344 2,126 Pricing Deck - Mineral Sands (Low/High) 2,331 2,138 Flex - Capex (+10%/-10%) 2,302 2,168 200.0 600.0 800.0 (600.0)(400.0) (200.0)400.0 A\$m variance from Base Case Post-Tax NPV



2,943

# **Appendix: Industry Revenue to Cash Cost Ratio**



The profitability of the Donald Project is illustrated by its competitive, first quartile R:CC ratio



# **Appendix: Funding Strategy**



### Project capital expenditure estimate to be funded by efficient deployment of debt and equity capital



# **Appendix: Considered, Targeted Offtake Approach**

Globally recognised offtake partners to be targeted



# **Appendix: Quality Product Attributes**



### Astron's attractive reserve assemblage translates into a high-quality product suite ensuring market acceptance

### **Rare Earth Element Concentrate (REEC)**

- Donald's REEC product is a high-quality monazite, xenotime concentrate that contains over 60% total rare earth oxide (TREO) content with Nd/Pr over 20% and Dy/Tb over 2% of TREO
- It also contains significant heavy rare earths (terbium and dysprosium), which are more strategically important and scarce when compared to the lighter rare earth elements
- Heavy rare earths are used in a variety of specialty applications and are key to electric vehicles, offshore wind and broader de-carbonisation
- The four critical magnet rare earth elements comprise 23.1% of the TREO contained in the Donald Project's REEC & 88.7% of total REEC value making it the most attractive product mix when compared to its peers, thus a major advantage for the purposes of offtake discussions



#### Distribution of Rare Earth Oxides in Donald REEC

### Heavy Mineral Concentrate (HMC)

- Donald will target a 95% heavy mineral grade, resulting in a higher proportion of valuable minerals with lower waste
- The HMC product contains significant zircon (~20% ZrO2), of which a majority (over 80%) is recoverable to a premium zircon quality suitable for the ceramics market
- Internal and independent test work completed by Foshan Ceramics Institute on zircon contained in HMC produced by the Donald Project shows low impurity levels and high whiteness when grounded and applied as a coating to ceramics which provide an advantage over its competitors
- Astron had obtained an export licence for the Donald HMC product. Independent analysis undertaken by Foshan Ceramics Institute and downstream customers demonstrates that Donald premium zircon meets the requirements in relation to radiation levels for its use in the Chinese ceramics market



Source: Adamas Intelligence, data as at Q1 2023

# **Appendix: Rare Earth Product Testing – Valuable REEC**

Strategically positioned at the head of the value chain, Astron is in active discussions with prospective processing partners for off-take agreements. By producing a rare earth concentrate on-shore, Astron can adapt to the growth of global rare earth metals and permanent magnet markets.

### **Rare Earth Value Chain**



### Valuable Heavy Rare Earth Component

- Donald's REEC product is expected to be highly attractive with its rare earth assemblage given the significant proportion of valuable heavy rare earth elements of Dysprosium and Terbium.
- Dysprosium and Terbium are used in electric and hybrid vehicles to increase the temperature at which the permanent magnets can operate.

Astron is actively investigating transport options regarding the rare earth mineral concentrate and plans to provide detailed updates subsequent to negotiation of offtake discussions. Based on the DFS, REEC will be transported as a Class 7 product.

### Typical Donald Project Rare Earth Product<sup>1</sup>

	Company	Astron				
	Mineral type	Monazite +Xenotime				
	Location	Aus	tralia			
	Rare Earth Oxide	REO price <sup>2</sup> (US\$/kg)	% of total	Basket Value		
	Lanthanum	1.40	19.1%	0.27		
Ц Ш	Cerium	1.45	40.0%	0.58		
Dt R	Praseodymium	125.00	4.6%	5.77		
Ligl	Neodymium	128.75	16.4%	21.13		
	Samarium	2.75	3.1%	0.08		
	Europium	30.00	0.1%	0.03		
	Gadolinium	66.00	2.3%	1.53		
	Terbium	2,150.00	0.3%	7.40		
L M	Dysprosium	410.00	1.8%	7.20		
2	Holmium	170.00	0.4%	0.60		
lea	Erbium	48.50	1.0%	0.46		
-	Thulium	0.0	0.1%	0.00		
	Ytterbium	17.10	0.8%	0.14		
	Lutetium	865.00	0.1%	0.96		
Other	Yttrium	10.00	10.0%	1.00		
	Basket Price US\$/kg TREO% <sup>3</sup>			47.16 ~61.5%		

1. Typical product specifications developed from the lab-scale test works as announced on 14 May 2021, *Clarify Donald Mineral Separation Metallurgical Test Work*.

2. REO based upon Adamas Intelligence, Q1 2023

 TREO grade of 60% refers to the Donald Project rare earth product specification only, as pure mineral monazite and xenotime contain 67% TREO.

# **Appendix: Premium Zircon – Superior Attributes**



The premium zircon produced from Donald HMC has been independently confirmed by Foshan Ceramics Institute (leading Chinese ceramics institute) to be suitable for the premium ceramics market. Astron has extensive and long-term engagement with Zircon customers in China, Europe, North America and other markets with Donald premium zircon product samples being made available to potential customers for assessment prior to commercial off-take agreements.

### Premium Zircon Product CIE Whiteness Test Results<sup>1</sup>

Product testing conducted on Donald premium zircon, expected to represent over 80% of the zircon production stream, at Astron's research facility in Yingkou, China. The results confirmed that Donald premium zircon rates favourably with industry zircons.



### Donald ProjectCompetitor 12Competitor 22Competitor 32

1. For further information refer Astron ASX announcement, 12 May 2021, Updated Donald Project Premium Zircon Test Results.

2. Competitor premium zircon products are selected from available products in China.

Product	L - Brightness	A – Red- Green Scale	B – Yellow-Blue Scale
Donald Premium Zircon	94.84	0.12	3.86
Competitor Zircon 1	94.39	1.02	4.08
Competitor Zircon 2	93.57	0.86	3.82
Competitor Zircon 3	94.32	0.23	4.22

#### Note

C.

a. Results are measured on the CIE whiteness scale, L represents 'brightness', A represents 'red-togreen' scale, B represents 'yellow-to-blue' scale.

b. The CIE system is used to characterise colour by a luminance parameter and two colour co-ordinates.

Results were produced using a calibrated 'brightness tester' and standard deviation error can be expected

# **Appendix: History of Astron Corporation**

Listed in 1983, Astron Corporation has nearly 40 years' experience in the strategic minerals industries

1983 Listed on t	he ASX	<b>1992</b> Import of sand into export of chemicals	zircon China, zircon	<b>2001</b> Advanced UK sales t European	Materials o markets	2007 Sold Chin manufactu to Imerys A\$200M	a uring plant SA for	2012 Initial Ore Statement of Donald released; Acquisition Rights	Reserve for part Project is of Water	2015 First pilot p treatment o Project Or	olant of Donald e	nt Second Donald bulk Donald excavated		2022 Updated M Resource MIN5532	<b>2022</b> Updated Mineral Resource for MIN5532	
1983															2023	
	<b>1988</b> China Zirce Materials F	onium Projects	<b>1996</b> Zircon flour zirconium manufactur China	r, fused ring in	<b>2004</b> Acquires D Mineral Sa for \$11m	onald nds	<b>2009</b> Environme Effects Sta for Donald Project is p assessed	ent atement positively	<b>2014</b> Constructi high purity production in China	on of zirconia facility	<b>2016</b> Mineral Re update for Donald Pre	esource entire oject	<b>2020</b> Second pil treatment o Ore to proo Mineral Se test work o	ot plant of Donald duce HMC; paration completed	<b>2023</b> Updated Ore Reserve for MIN5532 and release of Definitive Feasibility Study	

# **Appendix: Donald Project – Ore Reserve Statement**



#### MIN5532

The Ore Reserve has been classified as Proven Ore Reserves, based on Measured Mineral Resources and Probable Ore Reserves, based on Indicated Mineral Resources. The results of the Ore Reserve estimate reflect the Competent Person's view of the deposit.

The JORC Code 2012 Table 1, Section 4 to support the Ore Reserve Estimate is included in Appendix B of the Donald Project Ore Reserve Statement released **31 March 2023**. The Ore Reserve estimates have been compiled in accordance with the guidelines defined in the 2012 JORC Code.

Note that Mineral Resources are reported inclusive of the Ore Reserve.

Classification	Tonnes (Mt)	Slimes (%)	Oversize (%)	HM (%)	llmenite (%HM)	Leucoxene (%HM)	Rutile (%HM)	Zircon (%HM)	Monazite (%HM)	Xenotime (%HM)
Within MIN5532										
Proved	263	15.4	9.8	4.4	21.6	25.9	5.5	16.7	1.8	0.67
Probable	46	19.7	11.1	4.1	21.3	20.1	5.5	15.3	1.8	0.64
Total	309	16.1	10.0	4.4	21.6	25.1	5.5	16.5	1.8	0.66

#### Note:

- 1. The ore tonnes have been rounded to the nearest 1Mt and grades have been rounded to two significant figures.
- 2. The Ore Reserve is based on Indicated and Measured Mineral Resource contained within mine designs above an economic cut-off.
- 3. A break-even cut-off has been applied defining any material with product values greater than processing cost as Ore.
- 4. Mining recovery and dilution have been applied to the figures above.
- 5. The area is wholly within the mining licence (MIN5532).
- 6. The rutile grades are a combination of rutile and anatase minerals.
- 7. The Ore Reserve estimates have been compiled in accordance with the guidelines defined in the 2012 JORC Code

#### RL2002 outside of MIN5532

The Ore Reserve has been classified as Proven Ore Reserves, based on Measured Mineral Resources and Probable Ore Reserves, based on Indicated Mineral Resources. The results of the Ore Reserve estimate reflect the Competent Person's view of the deposit.

The JORC Code 2012 Table 1, Section 4 to support the Ore Reserve Estimate is included in Appendix B of the Donald Project Ore Reserve Statement released **26 June 2023**. The Ore Reserve estimates have been compiled in accordance with the guidelines defined in the 2012 JORC Code.

Note that the Mineral Resources are reported inclusive of the Ore Reserve.

Classification	Tonnes (Mt)	Slimes (%)	Oversize (%)	HM (%)	llmenite (%HM)	Leucoxene (%HM)	Rutile (%HM)	Zircon (%HM)	Monazite (%HM)
RL2002 outside MIN55	532								
Proved	152	7.1	18.8	5.6	31.3	18.2	9.4	21.1	1.8
Probable	364	13.7	15.7	4.1	32.8	19.3	7.5	17.1	1.6
Total	516	11.7	16.6	4.6	32.3	18.9	8.2	18.6	1.7

#### Note:

- 1. The ore tonnes have been rounded to the nearest 1 Mt and grades have been rounded to one decimal place.
- 2. The Ore Reserve is based on Indicated and Measured Mineral Resource contained within mine designs above an economic cut-off.
- 3. The economic cut-off is defined as the value of the products less the cost of processing.
- 4. Mining recovery and dilution have been applied to the figures above.
- 5. The updated RL2002 Ore Reserve does not include an announced figure on xenotime due to historical samples used in the Ore Reserve calculation not being analysed for xenotime. Further drilling work consisting of a maximum of 958 drillholes may be undertaken to further define the Ore Reserve and delineate the xenotime content. Metallurgical test work confirms the existence of xenotime to be relatively consistent across the mineral deposit, which represents upside to the announced combined rare earth mineral figures. Thus, the xenotime content of the entire Donald Deposit has not been stated.
- 6. The rutile grades are a combination of rutile and anatase minerals.
- 7. The Ore Reserve estimates have been compiled in accordance with the guidelines defined in the 2012 JORC Code

# **Appendix: Donald Project – Mineral Resource Statement**



#### Mineral Resource above a 1% total HM cut-off

Classification	Tonnes	Total HM	Slimes	Oversize
Within MIN5532	(1911)	(70)	(70)	(70)
Moosurod	370	15	11.1	10.8
	372	4.0	14.4	12.0
	75	4.0	13.8	13.1
	/	3.5	13.5	10.6
Subtotal	454	4.4	14.2	12.8
Within RL2002 outside of	MIN5532			
Measured	343	3.9	19.8	8.1
Indicated	833	3.3	16.2	13.5
Inferred	1,595	3.3	15.7	6.0
Subtotal	2,771	3.4	16.4	8.5
Total within Donald Depo	sit (RL2002 & MIN5532)			
Measured	715	4.2	17.0	10.6
Indicated	907	3.4	16.0	13.4
Inferred	1,603	3.4	15.7	6.0
Subtotal	3,225	3.6	16.1	9.1
Total within Jackson Dep	osit (RL2003)			
Measured	-	-	-	-
Indicated	1,903	2.8	19.0	5.8
Inferred	584	2.9	16.7	3.3
Subtotal	2,487	2.9	18.5	5.2
Total Donald Project				
Measured	715	4.3	18.1	11.1
Indicated	2,811	3.0	17.9	8.2
Inferred	2,187	3.3	16.4	5.5
Total	5 712	32	16 9	7.3

#### Note:

- 1. MRE is based on heavy liquid separation (HLS) analysis only.
- 2. The total tonnes may not equal the sum of the individual resources due to rounding.
- 3. The cut-off grade is 1% HM.
- 4. The figures are rounded to the nearest: 10M for tonnes, one decimal for HM, slimes and oversize.
- 5. For further details including JORC Code, 2012 Edition Table 1 and cross-sectional data, see previous announcements dated 7 April 2016 and 1 December 2022, available at ASX's website.

#### Mineral Resource where VHM data is available reported above a cut-off of 1% total HM

				-	-	% of total HM				
Classification	Tonnes (Mt)	HM (%)	Slimes (%)	Oversize (%)	Zircon	Rutile/ Anatase	Ilmenite	Leucoxene	Monazite	Xenotime
Within MIN5532										
Measured	394	4.2	16	10	16	7	21	24	1.8	0.66
Indicated	110	3.5	24	11	15	6	19	18	1.7	0.61
Inferred	20	2.3	22	14	13	7	19	20	1.4	0.55
Subtotal	525	4.0	18	10	16	7	21	23	1.8	0.65
Within RL2002 outs	ide of MIN5532	2								
Measured	185	5.5	19	7	21	9	31	19	2.0	
Indicated	454	4.2	16	13	17	7	33	19	2.0	
Inferred	647	4.9	15	6	18	9	33	17	2.0	
Subtotal	1,286	4.8	16	9	18	8	33	18	2.0	
Total within Donald	Deposit (RL20	02 & MIN55	32)							
Measured	579	4.6	17	9	18	8	25	22	1.9	
Indicated	564	4.1	17	13	17	7	31	19	2.0	
Inferred	667	4.8	15	6	18	9	33	17	2.0	
Subtotal	1,811	4.6	16	9	18	8	30	19	1.9	
Total within Jackso	n Deposit (RL2	2003)								
Measured	-	-	-	-	-	-	-	-	-	
Indicated	668	4.9	18	5	18	9	32	17	2.0	
Inferred	155	4.0	15	3	21	9	32	15	2.0	
Subtotal	823	4.8	18	5	19	9	32	17	2.0	
Total Donald Project	t									
Measured	579	4.6	17	9	18	8	25	22	1.9	
Indicated	1,232	4.5	18	9	17	8	31	18	2.0	
Inferred	822	4.7	15	5	18	9	33	17	2.0	
Total	2,634	4.6	17	8	18	8	31	18	2.0	

#### Note:

1. MRE is based on heavy liquid separation analysis and where valuable heavy minerals (VHM) have been determined.

- 2. The total tonnes may not equal the sum of the individual resources due to rounding.
- 3. The cut-off grade is 1% HM.
- 4. The figures are rounded to the nearest: 1Mt for tonnes, one decimal for HM, monazite, whole numbers for slimes, oversize, zircon, rutile + anatase, ilmenite and leucoxene and two decimals for xenotime.
- 5. Zircon, ilmenite, rutile+anatase, leucoxene, monazite and xenotime percentages are reported as a percentage of HM.
- 6. Rutile + anatase, leucoxene and monazite resource has been estimated using fewer samples than the other valuable heavy minerals outside MIN5532. The accuracy and confidence in their estimate is therefore lower.
- 7. For further details including JORC Code, 2012 Edition Table 1 and cross-sectional data, see previous announcements dated 7 April 2016 and 1 December 2022, available at ASX's website

## **Appendix: Competitor Information & Disclosure**

#### SELECT COMPETITOR INFORMATION SOURCES

- 1. ASX Announcement, Sheffield Resources, ASX: SFX, Investor Presentation, 11 April 2023, Construction Stage
- 2. Kalbar Operations Pty Ltd, Investor Presentation to TZMI, November 2020, Development Stage
- 3. WIM Resources, https://www.wimresource.com.au/irm/content/avonbank.aspx?RID=312, extracted 7 February 2023, Development Stage
- 4. ASX Announcement, VHM Ltd, ASX:VHM, Prospectus, 5 January 2023, Development Stage
- 5. ASX Announcement, Strandline Resources, ASX:STA, Annual Report to Shareholders, 31 August 2022, Production Stage
- 6. ASX Announcement, Base Resources, ASX:BSE, 2022 Annual Report to Shareholders, 22 August 2022, Development Stage
- 7. ASX Announcement, Northern Minerals, ASX:NTU, Annual Report to Shareholders, 21 October 2022, Development Stage
- 8. ASX Announcement, Iluka Resources, ASX:ILU, 2022 Annual Report including Appendix 4E, 21 February 2023
- 9. ASX Announcement, Hastings Technology Metals Ltd, Annual Report to Shareholders, 30 September 2022
- 10. ASX Announcement, Ionic Rare Earths Ltd, Annual Report to Shareholders, 11 October 2022