



PLATINA  
RESOURCES LIMITED

ASX Code: PGM

# 6<sup>th</sup> Rare Earth Summit

## March 2014 Nanning Guangxi China

Robert Mosig Managing Director CEO

# SCANDIUM

21	44.956
2831	1.3
1539	
Sc	
[Ar]3d4s <sup>2</sup>	
2.99	3

expecting big demand with  
increased uses from a  
consistent supply

## Cautionary and Forward-Looking Statements

*This presentation contains “forward-looking information” which may include, but is not limited to, statements with respect to the future financial or operating performance of Platina Resources Limited (“Platina”), its subsidiaries and its projects, the future price of platinum group metals (“PGM’s”), the estimation of mineral resources, operating and exploration expenditures, costs and timing of development of new deposits, costs and timing of future exploration, requirements for additional capital, government regulation, environmental risks, reclamation expenses, title disputes or claims and limitations of insurance coverage. Often, but not always, forward-looking statements can be identified by the use of words such as “plans”, “expects”, “is expected”, “budget”, “scheduled”, “estimates”, “forecasts”, “intends”, “anticipates”, or “believes” or variations (including negative variations) of such words and phrases, or state that certain actions, events or results “may”, “could”, “would”, “might” or “will” be taken, occur or be achieved. Forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of Platina and/or its subsidiaries to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Such factors include, among others, general business, economic, competitive, political and social uncertainties; the actual results of current exploration activities; conclusions of economic evaluations; changes in project parameters as plans continue to be refined; future prices of PGM’s; possible variations of ore grade or recovery rates; failure of plant, equipment or processes to operate as anticipated; accident, labor disputes and other risks of the mining industry; and delays in obtaining governmental approvals or financing or in the completion of development or construction activities. Although Platina has attempted to identify important factors that could cause actual actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that could cause actions, events or results to differ from those anticipated, estimated or intended. Forward-looking statements contained herein are made as of the date of this presentation and Platina disclaims any obligation to update any forward-looking statements, whether as a result of new information, future events or results or otherwise. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Platina undertakes no obligation to update forward-looking statements if circumstances or management’s estimates or opinions should change. Accordingly, the reader is cautioned not to place undue reliance on forward-looking statements.*

## Competent Person’s Statement

*The information in this announcement that relates to the Owendale Indicated and Inferred Mineral Resource is extracted from the report entitled ASX Release “PGM Owendale Updated Resource Estimate” created on 3 October 2013 and is available to view on [www.platinareources.com.au](http://www.platinareources.com.au). The report was issued in accordance with the 2012 Edition of the JORC Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person’s findings are presented have not been materially modified from the original market announcement.*

*The information in this Presentation that relates to Exploration Results is based on information compiled by Mr M Dugmore who is a full time employee of Platina Resources Limited and who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Dugmore has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Dugmore consents to the inclusion in the presentation of the matters based on this information in the form and context in which it appears.*



## Periodic Table of the Elements

Periodic Table of the Elements																		18			
1																	VIIIA				
1A																	8A				
11A																					
1 H Hydrogen 1.0079	2 He Helium 4.00260																				
3 Li Lithium 6.941	4 Be Beryllium 9.01218															5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.00674	8 O Oxygen 15.9994	9 F Fluorine 18.998403	10 Ne Neon 20.1797
11 Na Sodium 22.989768	12 Mg Magnesium 24.305	3 IIIB Sc Scandium 44.95591	4 IVB Ti Titanium 47.88	5 VB V Vanadium 50.9415	6 VIB Cr Chromium 51.9961	7 VIIB Mn Manganese 54.938	8 VIII Fe Iron 55.847	9 VIII Co Cobalt 58.9332	10 VIII Ni Nickel 58.6934	11 IB Cu Copper 63.546	12 IIB Zn Zinc 65.39	13 IIIA Al Aluminum 26.981539	14 IVA Si Silicon 28.0855	15 VA P Phosphorus 30.973762	16 VIA S Sulfur 32.066	17 VIIA Cl Chlorine 35.4527	18 VIIIA Ar Argon 39.948				
19 K Potassium 39.0983	20 Ca Calcium 40.078	21 Sc Scandium 44.95591	22 Ti Titanium 47.88	23 V Vanadium 50.9415	24 Cr Chromium 51.9961	25 Mn Manganese 54.938	26 Fe Iron 55.847	27 Co Cobalt 58.9332	28 Ni Nickel 58.6934	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.732	32 Ge Germanium 72.64	33 As Arsenic 74.92159	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80				
37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	39 Y Yttrium 88.90585	40 Zr Zirconium 91.224	41 Nb Niobium 92.90638	42 Mo Molybdenum 95.94	43 Tc Technetium 98.9072	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.9055	46 Pd Palladium 106.42	47 Ag Silver 107.8682	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.71	51 Sb Antimony 121.760	52 Te Tellurium 127.6	53 I Iodine 126.90447	54 Xe Xenon 131.29				
55 Cs Cesium 132.90543	56 Ba Barium 137.327	57-71	72 Hf Hafnium 178.49	73 Ta Tantalum 180.9479	74 W Tungsten 183.85	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.9665	80 Hg Mercury 200.59	81 Tl Thallium 204.3833	82 Pb Lead 207.2	83 Bi Bismuth 208.98037	84 Po Polonium [208.9824]	85 At Astatine 209.9871	86 Rn Radon 222.0176				
87 Fr Francium 223.0197	88 Ra Radium 226.0254	89-103	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [268]	110 Ds Darmstadtium [269]	111 Rg Roentgenium [272]	112 Cn Copernicium [277]	113 Uut Ununtrium unknown	114 Uuq Ununquadium [289]	115 Uup Ununpentium unknown	116 Uuh Ununhexium [298]	117 Uus Ununseptium unknown	118 Uuo Ununoctium unknown				
Lanthanide Series		57 La Lanthanum 138.9055	58 Ce Cerium 140.115	59 Pr Praseodymium 140.90765	60 Nd Neodymium 144.24	61 Pm Promethium 144.9127	62 Sm Samarium 150.36	63 Eu Europium 151.9655	64 Gd Gadolinium 157.25	65 Tb Terbium 158.92534	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93032	68 Er Erbium 167.26	69 Tm Thulium 168.93421	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967					
Actinide Series		89 Ac Actinium 227.0278	90 Th Thorium 232.0381	91 Pa Protactinium 231.03588	92 U Uranium 238.02891	93 Np Neptunium 237.0482	94 Pu Plutonium 244.0642	95 Am Americium 243.0614	96 Cm Curium 247.0703	97 Bk Berkelium 247.0703	98 Cf Californium 251.0796	99 Es Einsteinium [254]	100 Fm Fermium 257.0951	101 Md Mendelevium 258.1	102 No Nobelium 259.1009	103 Lr Lawrencium [262]					
		Alkali Metal	Alkaline Earth	Transition Metal	Basic Metal	Semimetals	Nonmetals	Halogens	Noble Gas	Lanthanides	Actinides										

## ✧ *Discovered in Scandinavia*

- *Lars Nilson 1879*

## ✧ *Density*

- *2.985 g/cm<sup>3</sup>*

## ✧ *Melting Point*

- *2806 F (1541 C)*

## ✧ *Boiling Point*

- *5136 F (2836 C)*

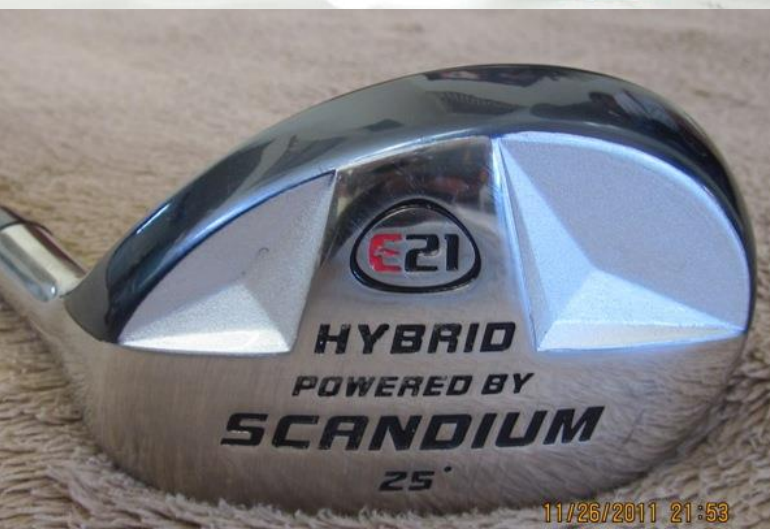
## ✧ *Characteristics*

- *Soft, light metal*
- *Easily oxidises*
- *Corrosion resistant*
- *Lacks affinity to combine with other elements (seldom found in common ores)*
- *Commonly occurs with lanthanide elements (transition metal with lowest atomic number)*

- Primarily occurs as trace constituent of ferromagnesium minerals
- 5-100 ppm in amphibole-hornblende, pyroxene & biotite
- Ferromagnesium minerals commonly occur in mafic / ultramafic igneous rocks
- Enrichment of Sc also in Al-phosphate minerals, beryl, cassiterite, columbite, garnet, muscovite, rare-earth minerals and wolframite
- Found in minerals thortveitite, euxinite and gadolinite.





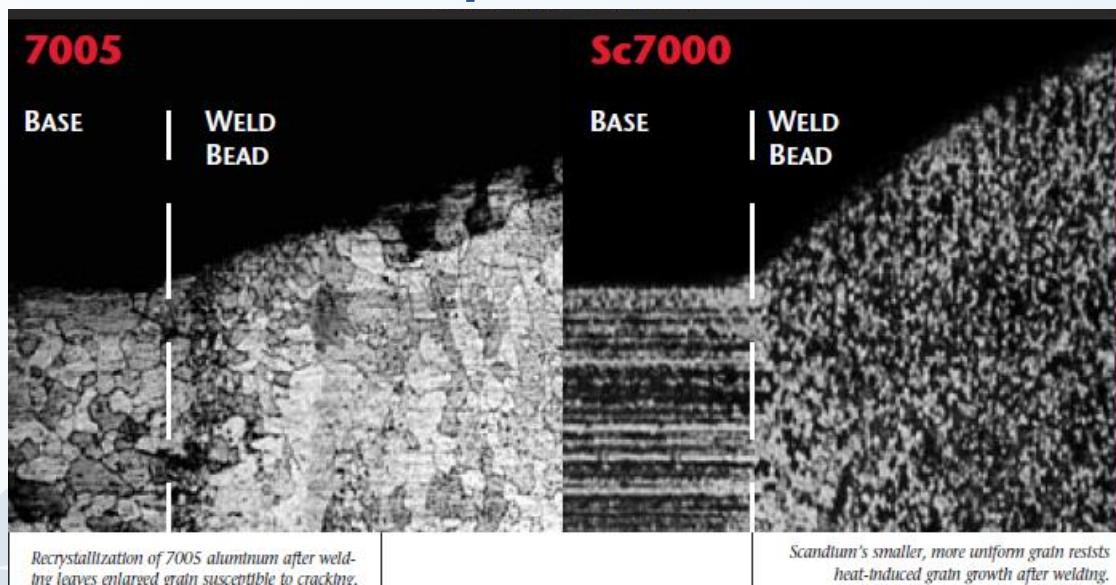


- ❧ *Supply remains stable*
- ❧ *Global consumption ~10 tonnes pa*
- ❧ *Sports equipment and aerospace industry is leading use of Sc, also high-power metal halide lamps however,*
- ❧ *Sc producers compete with carbon fibre and carbon nanotube technology for market share*
- ❧ *Titanium alloys are similarly light, strong but cheaper.*





- ❧ *Sc-reinforced Al alloys represent new generation of high-performance alloys with advantages over other Al alloys*
  - *stronger*
  - *strengthens welds*
  - *limits excessive grain growth that occurs in heat-affected zone of welded Al components*



Source: <http://www.eastoncycling.com/bike/wp-content/uploads/2010/04/RD-03-Scandium.pdf>

## **BENEFITS**

- ❧ ***Strengthening of Al-alloys by 3x with as little as 0.5% Sc***
- ❧ ***Sc-stabilised zirconia enjoys growing demand for use as high efficiency electrolyte in SOFC***

## **CONSTRAINTS**

- ❧ ***The absence of reliable, secure, stable, long term production has limited commercial applications of Sc***
- ❧ ***Large scale industrial use historically constrained by high price due to low volumes of production and complex technology of preparation***

## Principal current supply sources

- *China, Kazakhstan, Russia, Ukraine*
- *Has not been found in sufficient concentration to be mined as primary product (UNTIL Owendale)*
- *As a result of its low concentration, Sc is produced exclusively as a by-product or recovered from tailings or residues*

## How & where it occurs

- *Australia, Phillipines (laterite nickel-cobalt deposits)*
- *Kazakhstan (uranium deposits)*
- *Russia (apatite)*
- *Madagascar, Norway (pegmatites)*
- *Ukraine (iron ore deposits)*
- *China (tin, tungsten, iron ore, rare earth deposits)*

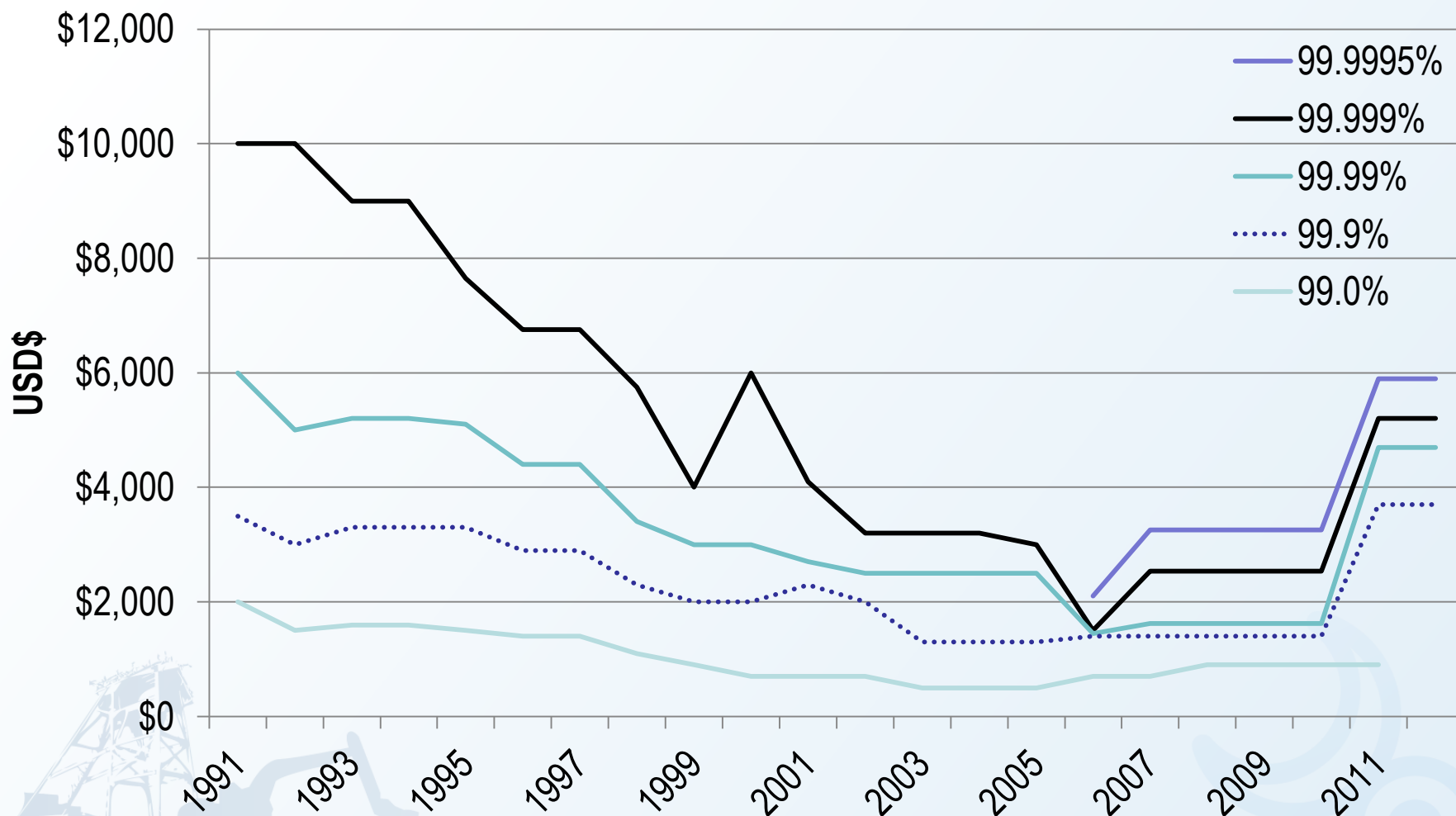




**Current by-product production**

**Occurrence**

## USD\$/kg Sc oxide



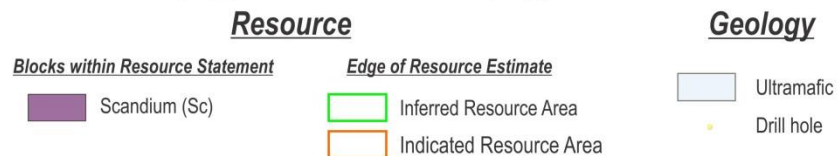
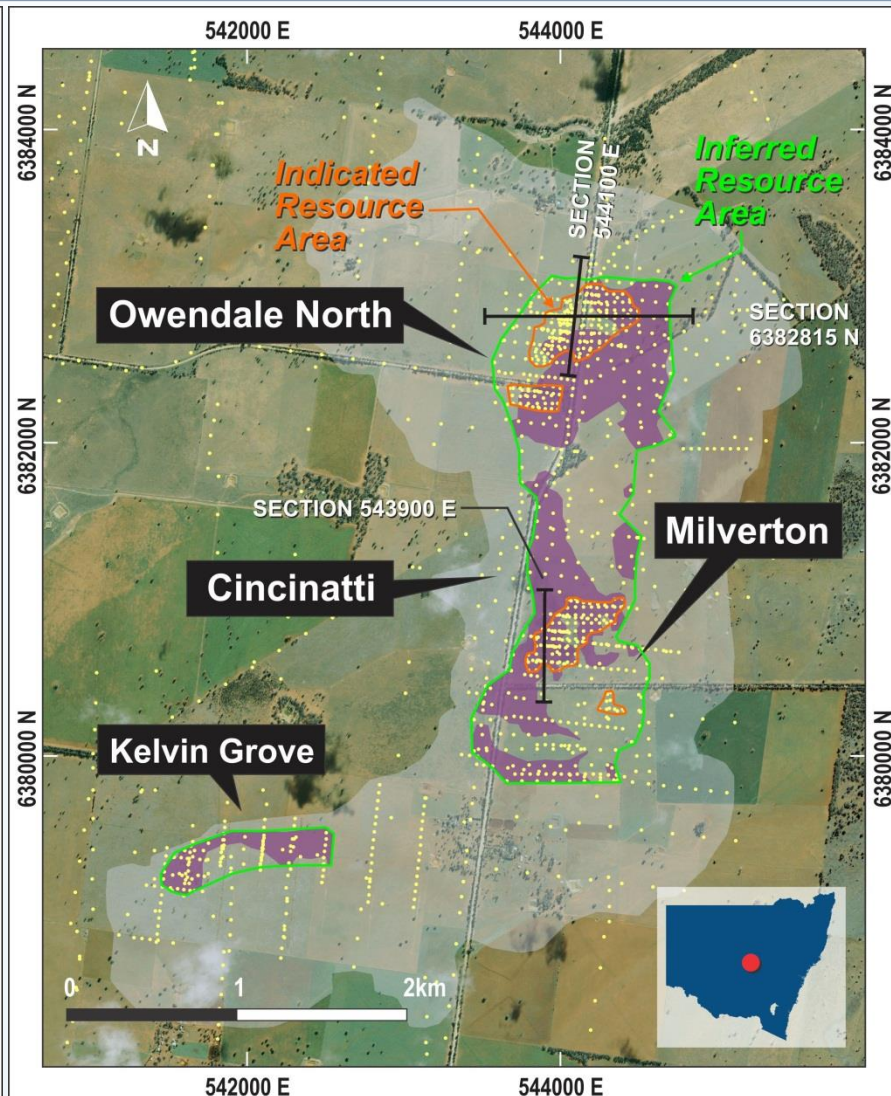
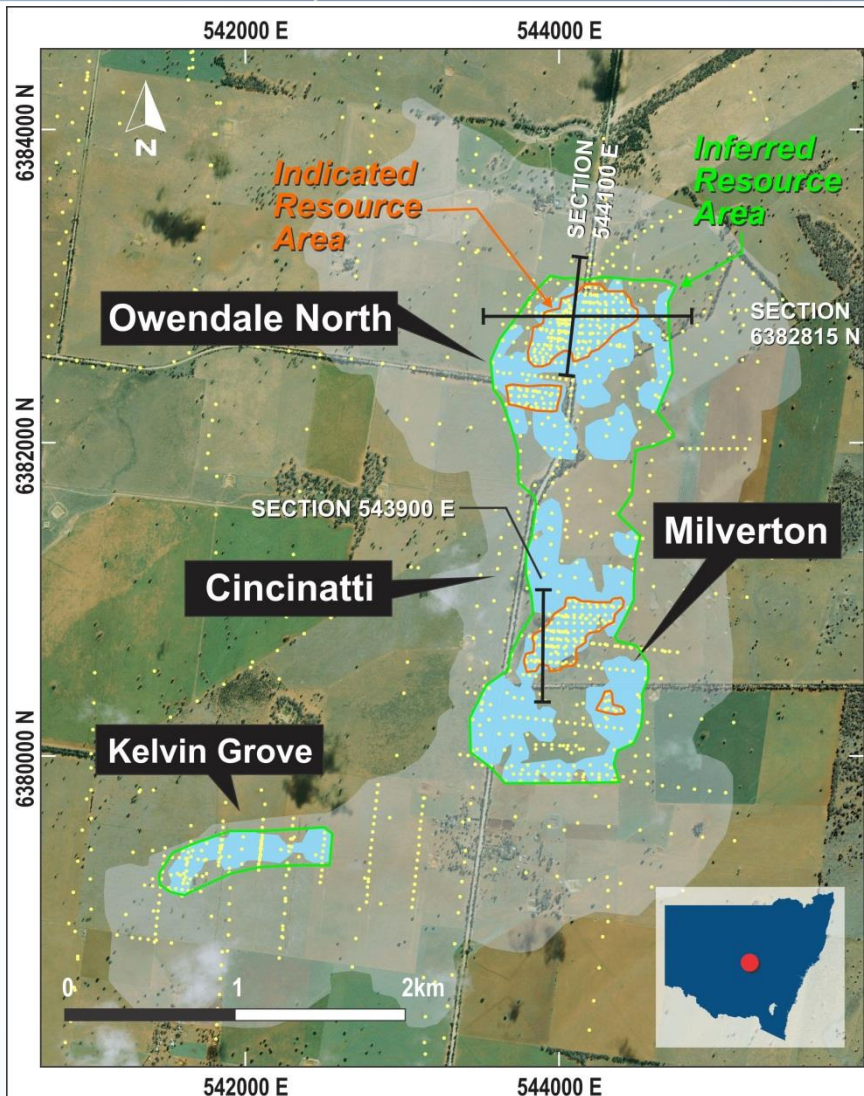
Source: USGS

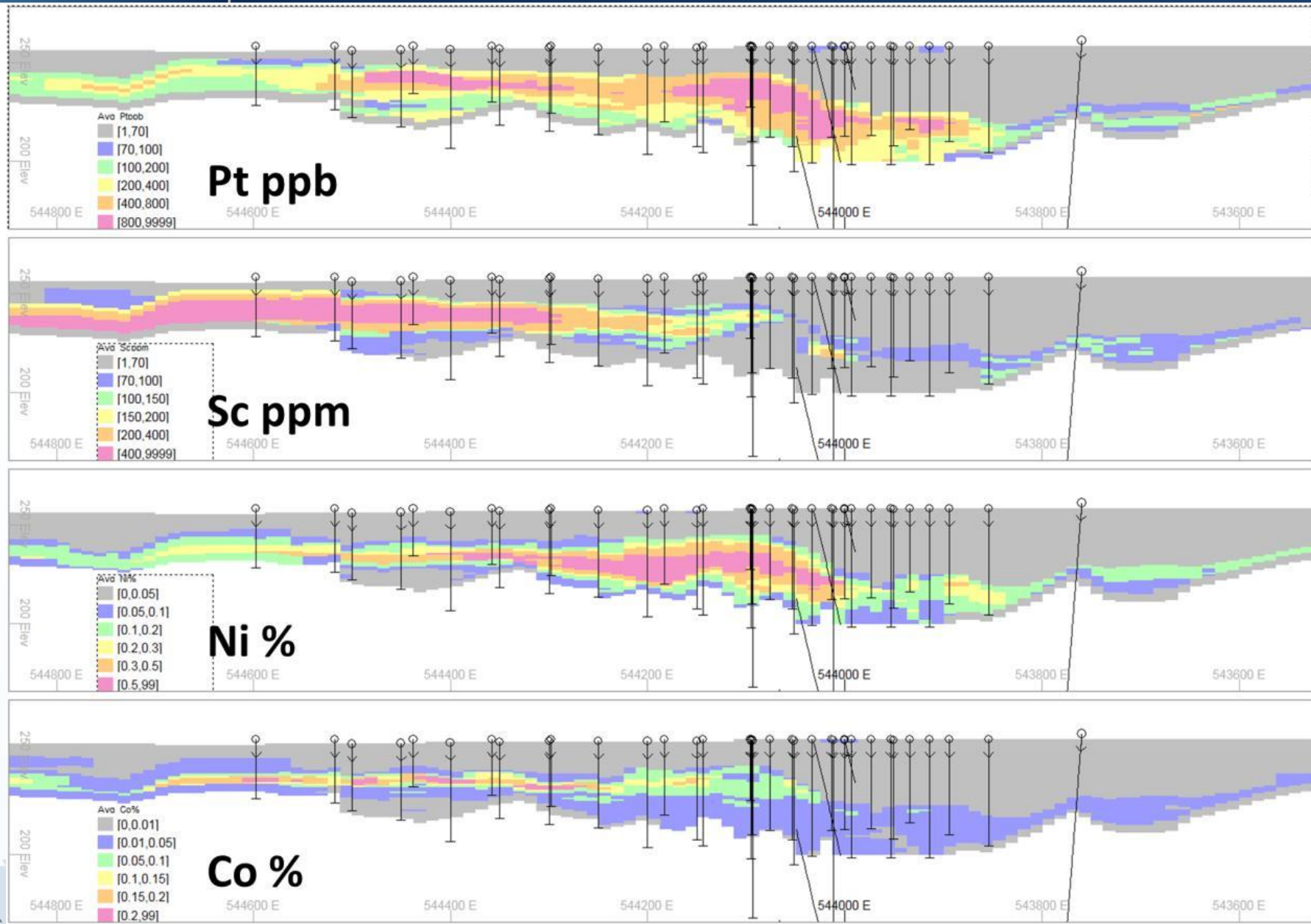


**OWENDALE**

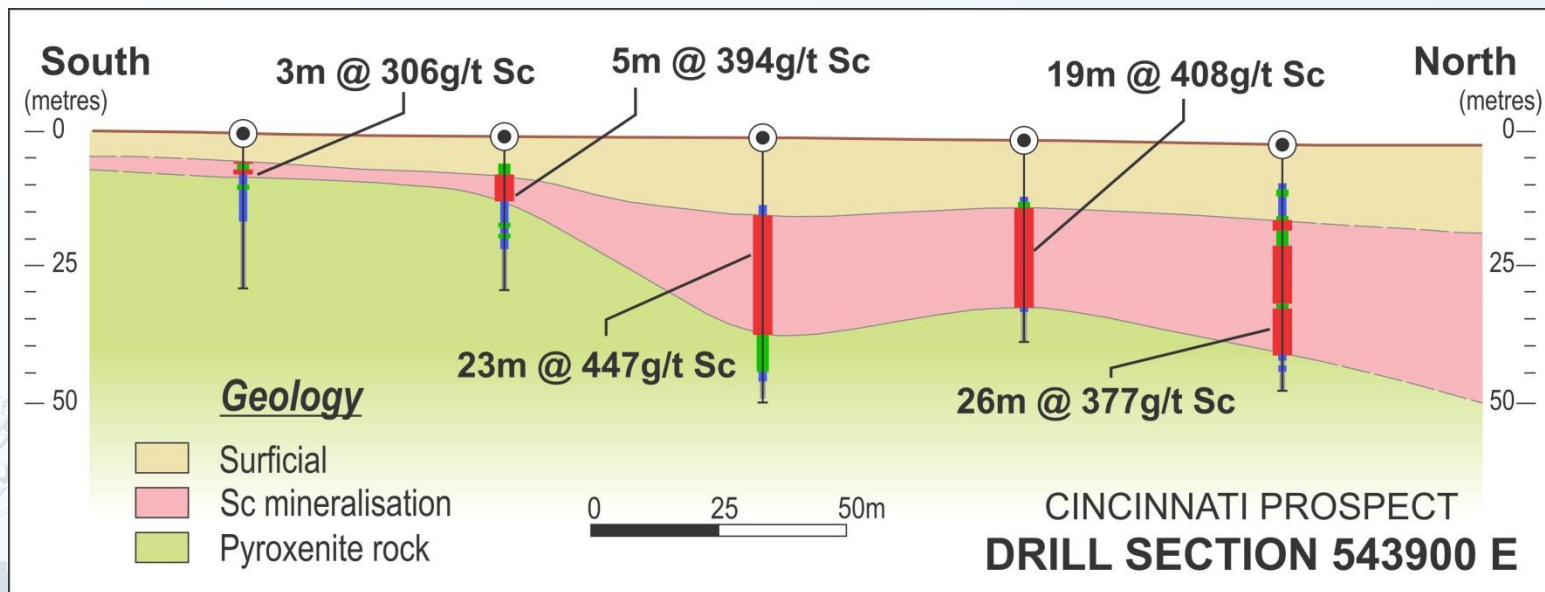
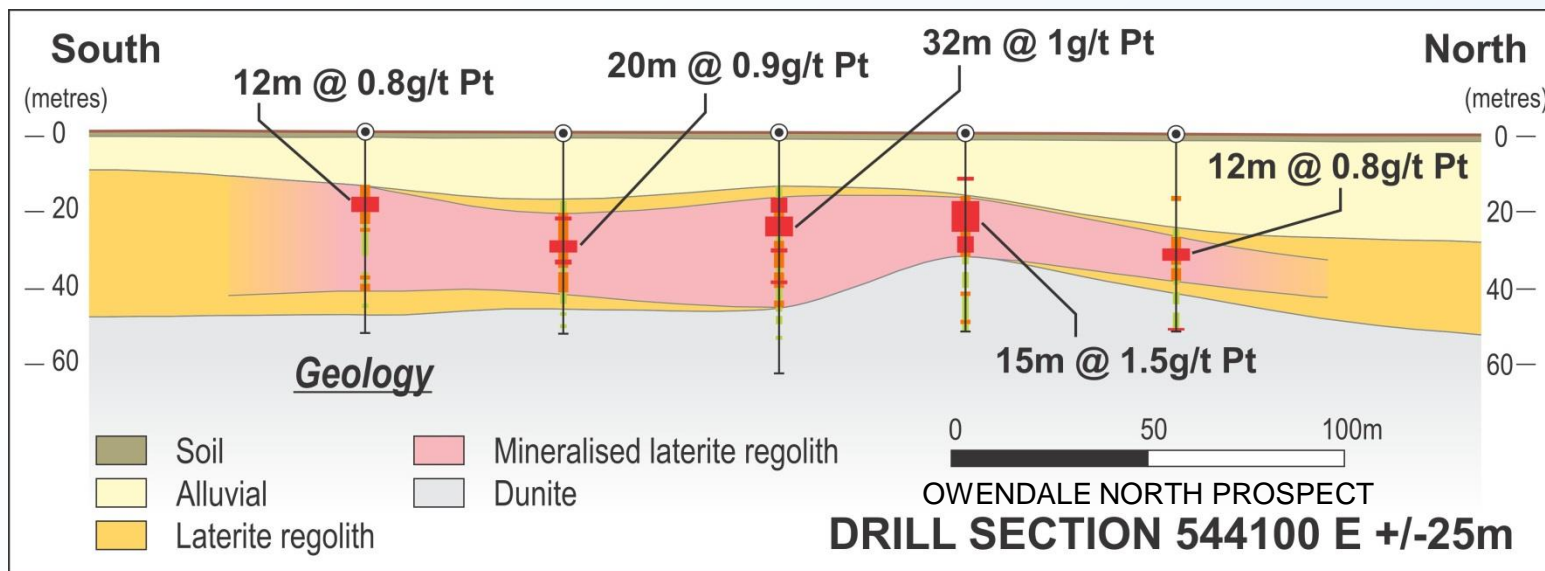
Platinum – Scandium Project













Resource Classification	Tonnage (Mt)	Pt g/t	Sc ppm	Ni %	Co %	Pt koz	Sc t	PtEq g/t
Indicated	4.2	0.53	401	0.13	0.06	72	1698	0.93
Inferred	19.4	0.33	380	0.11	0.06	205	7385	0.69
<b>TOTAL</b>	<b>23.7</b>	<b>0.36</b>	<b>384</b>	<b>0.11</b>	<b>0.06</b>	<b>277</b>	<b>9083</b>	<b>0.73</b>

- World's largest, highest-grade laterite hosted scandium deposit  
**9,1000 tonnes of contained scandium metal**
- Overlaps the platinum resource
- Research indicates demand for scandium increasing



Total Sc resource using a 300 ppm Sc cut-off, and showing resource classification. Estimation carried out by Golder



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# Thank You

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