



# **Samphire Uranium Project - April 2015**

***South Australian Resources and  
Energy Investment Conference 2015***

Monday 13 April 2015

# UraniumSA Limited - Corporate Statistics - April 2015

## Issued Securities

181.17m ordinary shares  
15.45m unlisted options  
inc. 6.2m directors options

### Option summary

5.0 m (\$0.06 - April 2016)  
4.0 m (\$0.06 - Sept 2016)  
0.65 m (\$0.06 – Nov 2017)  
5.80 m (\$0.20 – Oct 15 to Oct 16)

## Market Cap

\$3.80 m (@ \$0.021)  
(2014 range \$5.9m - \$2.4m)

## 2015 trading range

\$0.026 high \$0.017 low

## 2014 trading range

\$0.034 high \$0.014 low

## 2013 trading range

\$0.071 high \$0.021 low

## Shareholder statistics

Total 1770  
Top 20 = 50.96 % Top 50 = 63.25%  
Directors = 8.77 %

## Top 20 shareholders as at 10 April 2015

1	MR LINDSAY MURRAY CARTHEW <LMCFT A/C>	27,325,693	15.08
2	MOTTE & BAILEY PTY LTD	8,101,845	4.47
3	MR DENNIS JUN TOW	7,540,000	4.16
4	J P MORGAN NOMINEES AUSTRALIA LIMITED	6,522,288	3.60
5	HSBC CUSTODY NOMINEES (AUS) - A/C 3	6,089,674	3.36
6	BLUCK HOLDINGS PTY LTD	5,923,015	3.27
7	HILTABA GOLD PTY LTD	3,888,238	2.15
8	MS ALICE MCCLEARY	3,814,910	2.11
9	MONEX BOOM SECURITIES (HK) LTD	2,671,021	1.47
10	MR BEDE LANCE RAMAH	2,660,158	1.47
11	MR LUKE WILLIAM WRIGHT RIDHALGH	2,500,000	1.38
12	MR DAVID ALASTER PATERSON	2,351,434	1.30
13	MUTUAL TRUST PTY LTD	2,310,500	1.28
14	SUNRISE WA PTY LTD	2,197,903	1.21
15	MARTIN S JANES + ADRIENNE F JANES	2,000,000	1.10
16	MR MEOW SENG LEE	1,398,595	0.77
17	CITICORP NOMINEES PTY LIMITED	1,348,298	0.74
18	MS ALICE MCCLEARY + MR BRIAN J MCCLEARY	1,299,546	0.72
19	MR GREGORY J CONNOR + SUE CONNOR	1,250,000	0.69
20	EAP NOMINEES PTY LTD	1,135,208	0.63
		92,328,326	50.96

## Directors

Alice McCleary (Independent Non-Exec. Chairman)  
David Paterson (Executive Director & Acting CEO)  
Russel Bluck (Executive Director)  
Martin Janes (Independent Non-Exec. Director)



# Disclaimer

*This presentation has been prepared by UraniumSA Limited in summary form and does not purport to be complete. The Company therefore gives no warranties as to the accuracy, reliability or completeness of the information (except to the extent liability under statute cannot be excluded).*

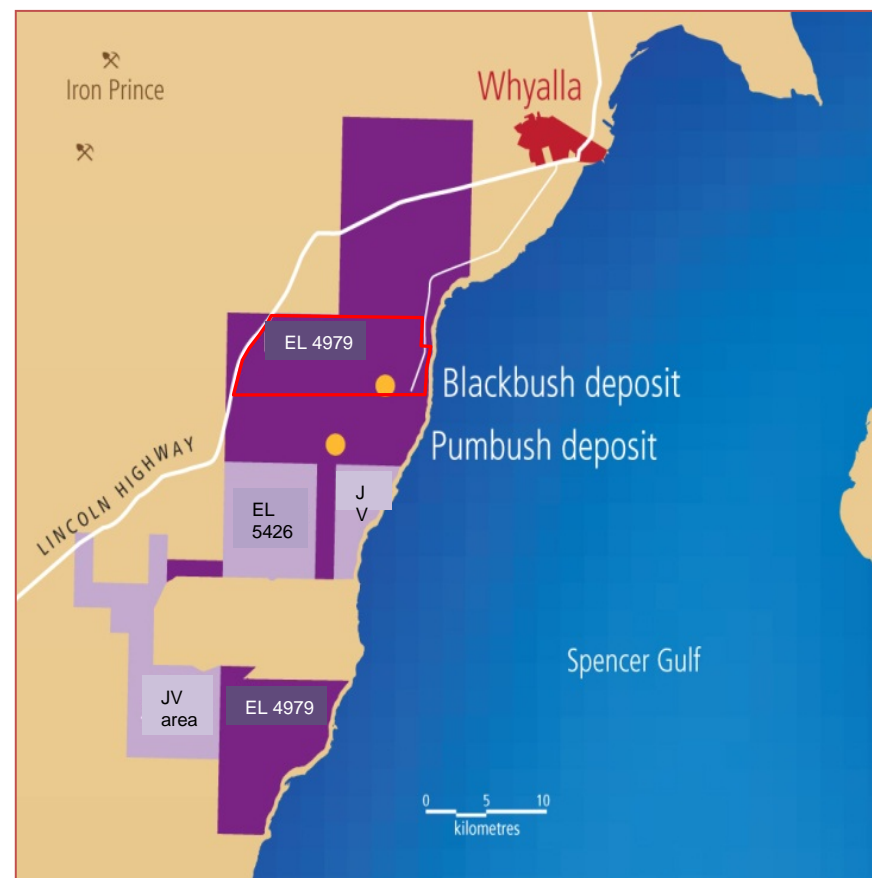
*The interpretations and conclusions presented herein are based on technical information and geological theory available to the Company and on materials provided to the market in releases to the Australian Securities Exchange which are available from the web sites of UraniumSA and Australian Securities Exchange (ASX) or otherwise in the public domain. It is the nature of all scientific interpretations and conclusions that they are founded on an assessment of probabilities and there is no claim of complete certainty made and assumptions concerning the possible progress of exploration and development are conjectural.*

*The exploration results and mineral resource estimates reported herein are based on information compiled by Russel Bluck a Director and employee of UraniumSA Limited and a Member of the Australian Institute of Geoscience with sufficient experience relevant to the style of mineralisation and type of deposits being considered and to the activity undertaken and reported to qualify as a Competent Person as defined by the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2012 Edition). Mr Bluck has consented in writing to the inclusion in the report of matters based on his information in the form and context in which it appears.*

*The results mentioned above or given elsewhere in this presentation are preliminary and it should not be assumed that further exploration will result in an increase in Mineral Resources or the future development of a mining operation.*

*The technical terms and usage in this presentation are the same as those of the UraniumSA Limited reports to the ASX for the as noted at the foot of relevant pages and the reader is referred to those document which are available from either the UraniumSA Limited website at [uraniumsa.com.au](http://uraniumsa.com.au) or from the ASX website.*

## SAMPHIRE PROJECT - *location*





## SAMPHIRE PROJECT – *land use and geographic domains*



View east looking towards  
Spencer Gulf ~ 7km east

**Land use** pastoral grazing  
**Vegetation** unimproved  
native vegetation

**Coastal plain** ~50m Eocene etc  
on Hiltaba granite

**Escarpment** edge granite and  
limit of Eocene

**Tableland** metamorphic  
basement

## BLACKBUSH deposit - *drilled mineralisation*

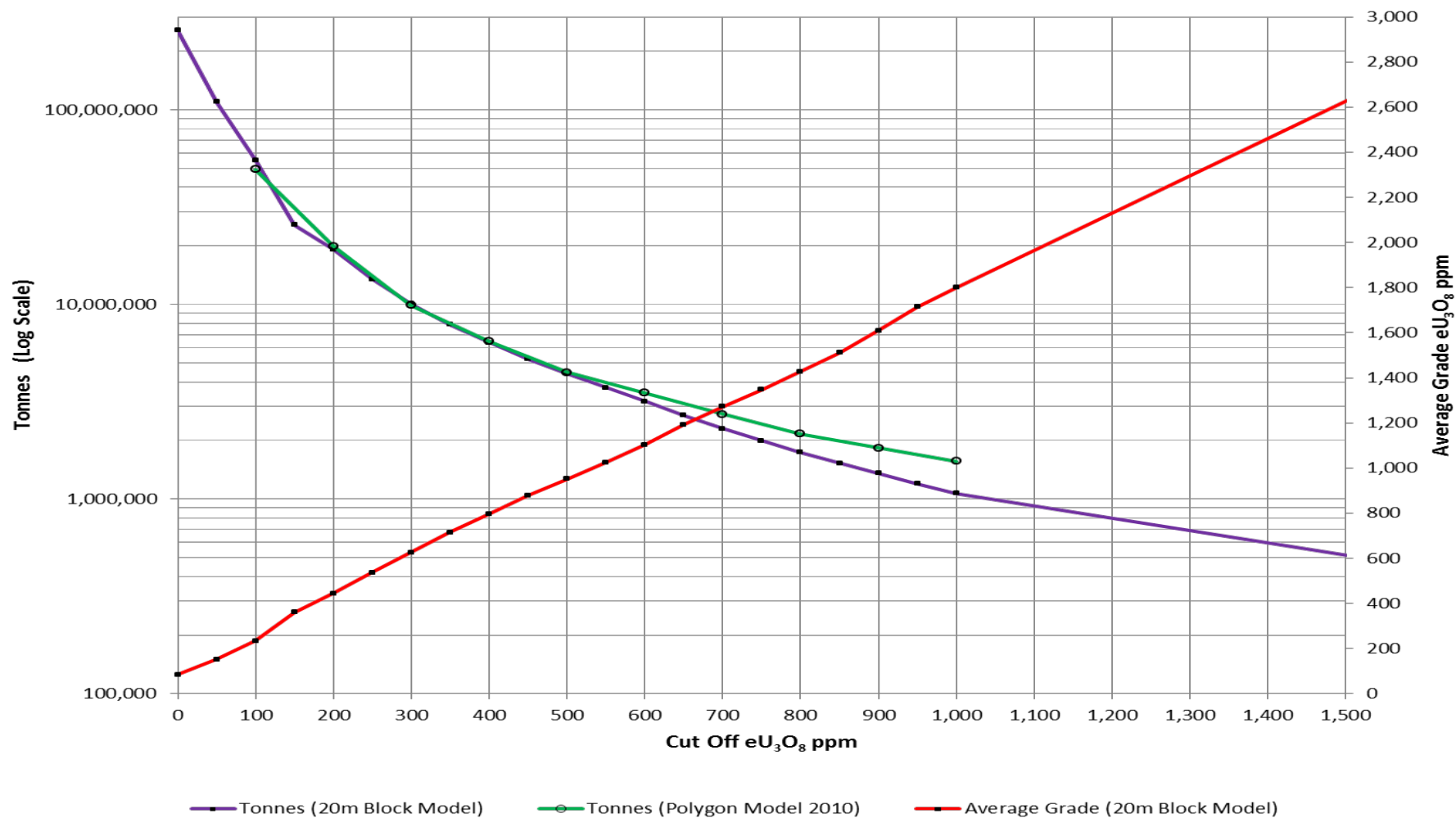
**Blackbush** Inferred Resource estimate JORC 2012 (ASX 27 September 2013)

**64.5Mt** at **230ppm** eU<sub>3</sub>O<sub>8</sub> containing **14,850 t** (*100ppm cut off*)

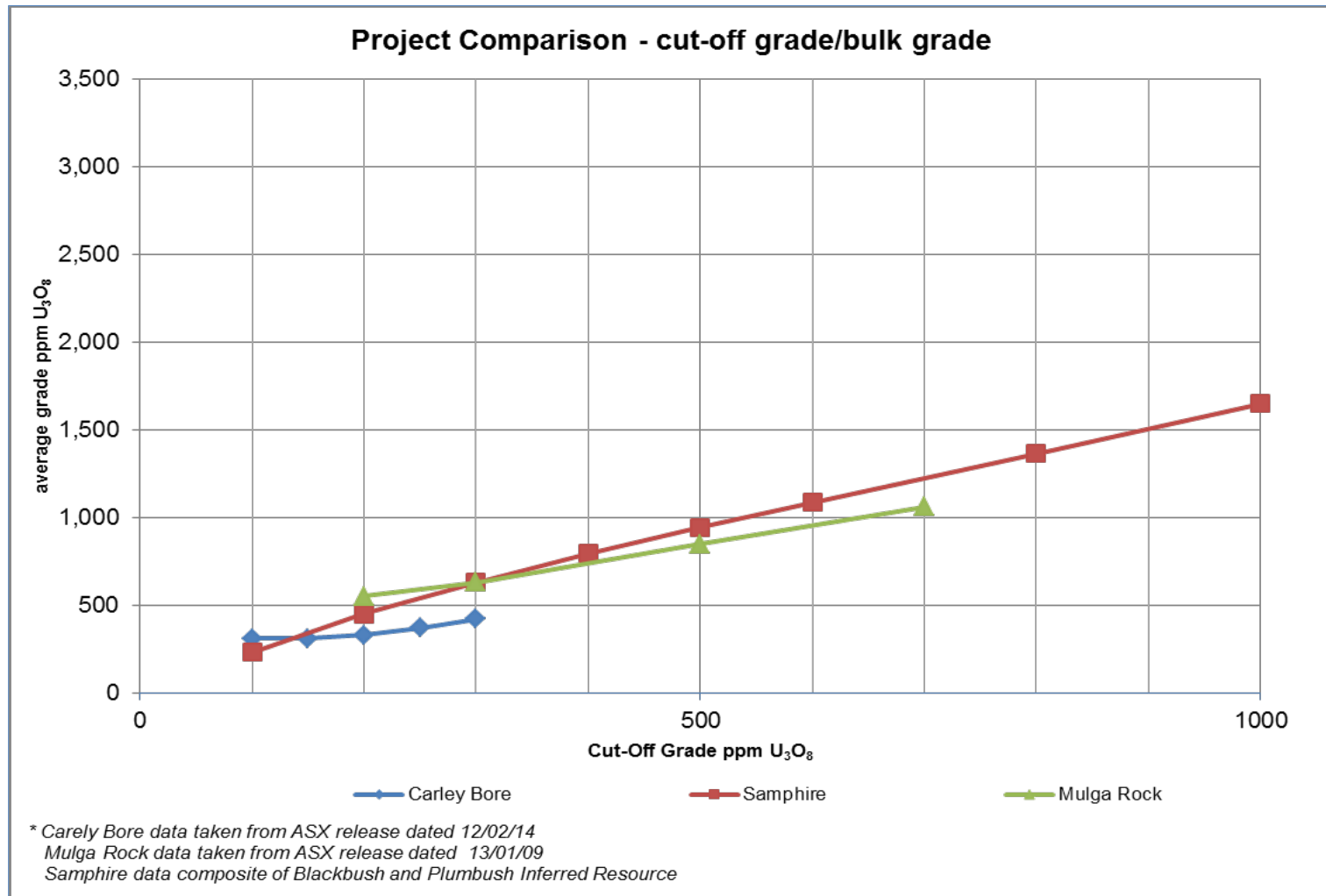
Mineralisation has been estimated on the basis of the major hosting lithotypes and across a range of cut-off grades

Code	Resource Subdomain	Description
MELS	Melton Sand Lithotype	Sand and clay, Miocene Melton Sand.
FGOR	Kanaka Beds Lithotype	Fine-grained/organic rich, Eocene Kanaka Beds. <i>Potentially ISR amenable.</i>
SAND	Kanaka Beds Lithotype	Sand-dominant (incl. gravels), Eocene Kanaka Beds. <i>Potentially ISR amenable.</i>
UNC	Unconformity Zone	Eocene unconformity, +1m to -1m
SAPR	Basement Lithotype	Saprolite/saprock/clay altered basement granite

# BLACKBUSH deposit - robust mineralisation



## SAMPHIRE project - very competitive with similar Australian projects





## SAMPHIRE project – *exploration and mineralisation*

1. Exploration has been focussed on sediment hosted mineralisation using a “**source – transport – deposition**” systems model and vertical rotary mud drilling
2. **Deposition sites** in reduced Eocene sediments. Three styles of sediment hosted mineralisation recognised at Blackbush:
  - a) **conventional roll-fronts** - within the Eocene section: several generations of deposition, dissolution and re-deposition in individual fronts
  - b) **stratabound mineralisation** - some roll front characteristics: confined to Blackbush West
  - c) **blanket mineralisation** - localised at the basal Eocene unconformity in Blackbush West
3. **Transport systems** on present information:
  - a) **formation waters** – formation waters at the basal unconformity are anomalously in uranium and radiogenic daughters
  - b) **epithermal fluids** - saline metal anomalous fluids are present in altered granites which have well developed epithermal veining. Structural controls are not well defined.
3. **Source of uranium** – the Hiltaba suite Samphire granite which is:
  - a) **uranium anomalous** – with values commonly in the 20 -30ppm range and a best intersection of 50.09m @ 142ppm  $eU_3O_8$  with a peak grade of 537ppm  $eU_3O_8$
  - b) **highly fractionated** – with localised phases having Th/U ratios in the uraninite stability field

## BLACKBUSH deposit – *deposition sites* – Eocene Kanaka Beds

	AGE	Samphire Graphic Log	U	Lithology
Pirie Basin Sediments	Miocene			OFFSHORE MARINE <i>Melton Limestone grading down into inter-fingered carbonate clays and clean sand</i> BEACH BARRIER BAR
	Late Eocene			FLOOD TIDAL DELTA (2m) <i>Coarse sand overlain by limonitic mud</i>
				CENTRAL ESTUARY LAGOONAL (3-5m) <i>Comprised of inter-bedded sand mud and lignite- fining upwards cycles</i>
				ANASTOMOSING BRAIDED FLUVIAL BAYHEAD DELTA (7m)
	Early Eocene			RETROGRADATIONAL BAYHEAD DELTA(20m) ANASTOMOSING FLUVIAL <i>Comprising 2-3m thick upward coarsening cycles</i>
				ANASTOMOSING FLUVIAL <i>Comprising 2-3m thick upward fining cycles often capped with lignite</i>
				LOWSTAND BRAIDED FLUVIAL (5m) <i>Basal lithofacies directly overlying weathered granite basement</i>
	Proterozoic	 C S G P		HILTIBA SUITE A-TYPE GRANITE

### Blackbush fluvial channel

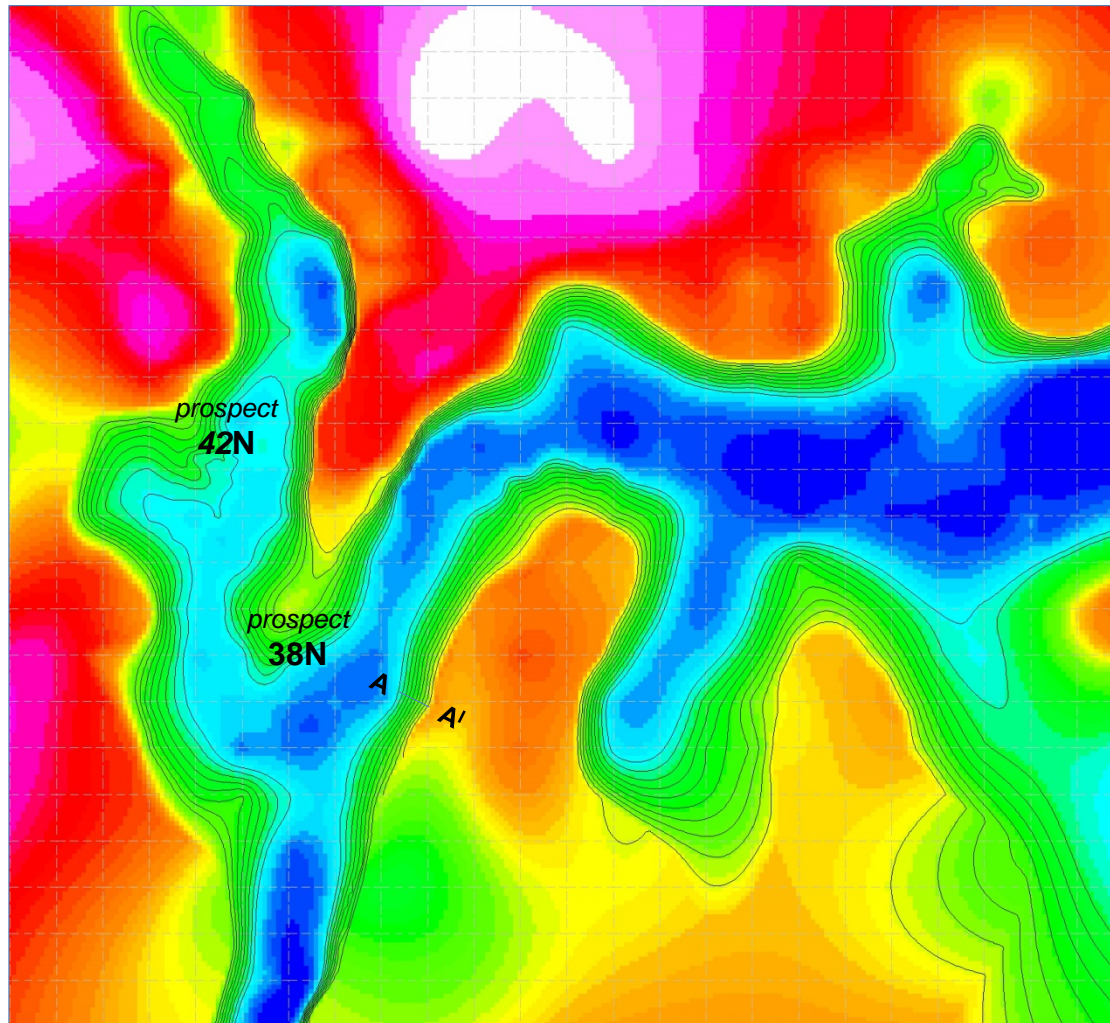
- The blue uranium bar is a visual reference for the distribution of mineralisation, it has no grade connotation
- The Kanaka Beds are generally reduced, the colours in the graphic log are to reflect variation within the sedimentary package

The channel is incised into a pre-Eocene palaeosurface developed on clay-altered Samphire granite (Hiltaba suite).

The channel headwaters do not extend beyond the granite palaeosurface.

The palaeo-topography of the basal Eocene unconformity indicates that erosional fault escarpments define /influence the channel margins, particularly at Blackbush West

## BLACKBUSH deposit – *structural influence on channel morphology*



Z elevation surface of the basal Eocene unconformity. Contours at 2m intervals.

**yellow-red-purple tones**  
unconformity surface on granite

**green tones**  
channel margins corresponding with steep gradients.  
*The fall across A-A' is 18m vertically in 63m (~30%) interpreted as an active fault escarpment contemporaneous with channel erosion/infill. Modern fault escarpments in the district have significantly lower fall rates*

**blue tones**  
low relief erosional base of the fluvial channel.  
*The fall from the northwest headwater to the east margin is ~20m in ~3,000m of channel*

*Prospects 38N and 42N are discussed in subsequent figures 13 and 14*



## BLACKBUSH deposit – *transport*

### 1. formation waters

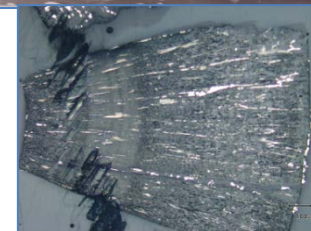
- a) there is a high variability in formation water salinity and radiogenic daughter product within the Eocene/Miocene sediment section, both vertically and laterally from west to east across the deposit
- b) locally high levels of radiogenic daughter products occur in formation waters from the basal unconformity adjacent to faulted altered, veined and mineralised granite at Blackbush West

### 2. epithermal fluids

- a) altered granites have well developed epithermal veining and indications of saline metal anomalous fluids
- b) minerals typical of high-level epithermal systems are present within clay-altered phases of the Samphire granite



*Fragment of bassanite ( $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$ ) partially replacing clustered long prismatic crystals of metamict-altered monazite ( $(\text{CeLa-NdYTh})\text{PO}_4$ ) with subordinate bright thread-like intergrowths of pyrite*



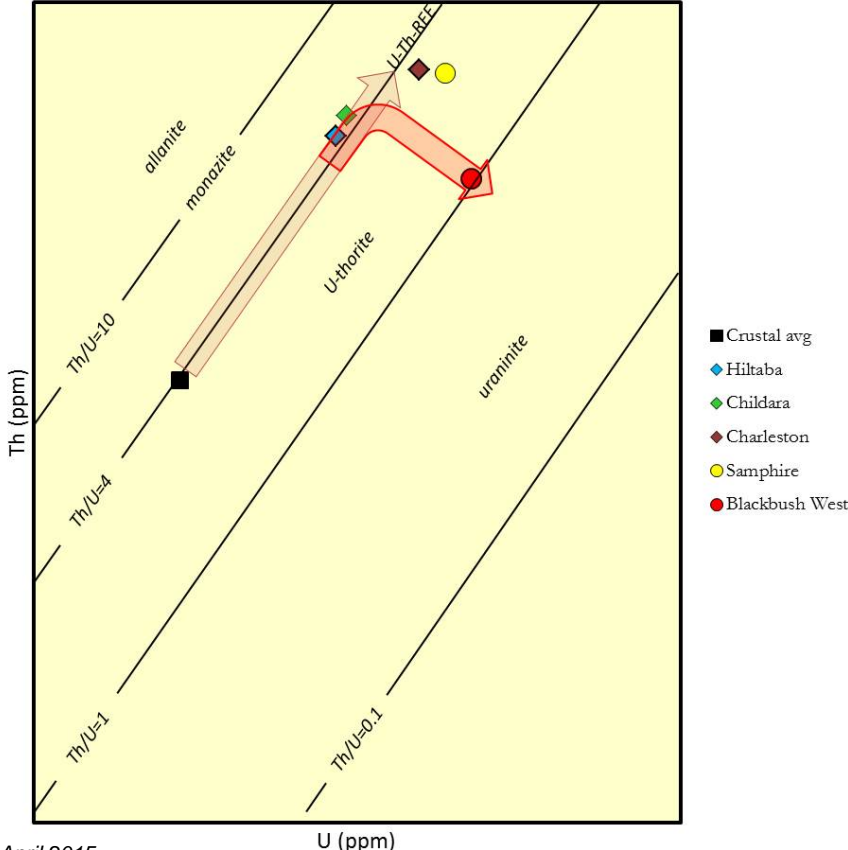
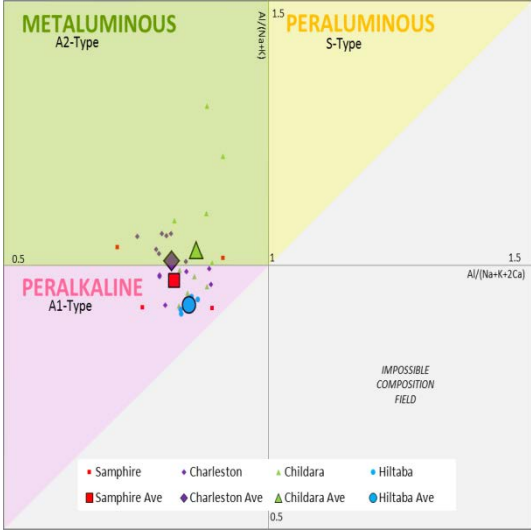
### 3. pathways

- a) fault escarpments were active pene-contemporaneous with fluvial channel formation and sedimentation (*previous slide*)
- b) The strike/dip of structures/veining in the granite have not been determined



# BLACKBUSH deposit – *Samphire granite as a uranium source*

The Samphire granite is part of the Mesoproterozoic Hiltaba Suite and falls within the peralkaline field, petrographically it is an A1 type

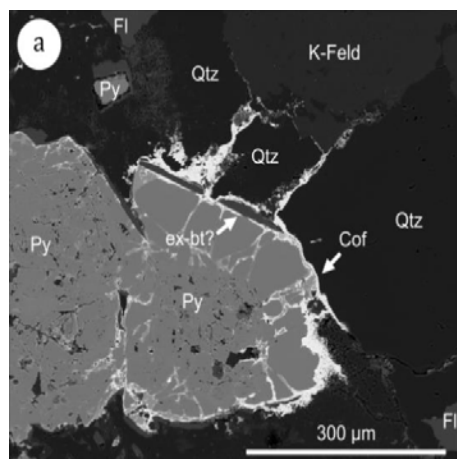


In granitic rocks as the Th/U ratio falls from >10 towards 0.1 the theoretical potential for uranium bearing minerals increases (allanite, monazite, urano-thorites, uraninite)

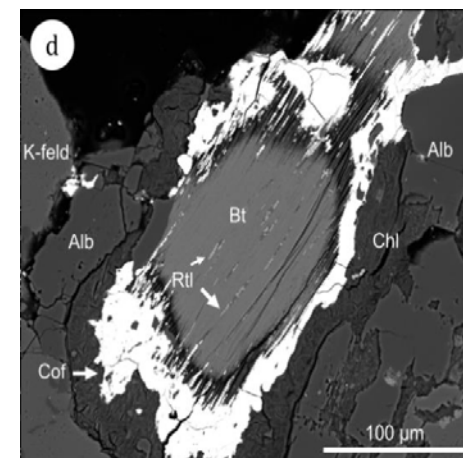
Hiltaba Suite granites (Hiltaba, Childara, Charleston, Samphire) trend from a crustal average composition along Th/U = 4 (brown arrow). Samphire granite (yellow) diverges from the trend towards Th/U = 1 and granite in the Blackbush area (red) plot at the margin of the uraninite stability field (red arrow)

# BLACKBUSH deposit – *uranium in the Samphire granite*

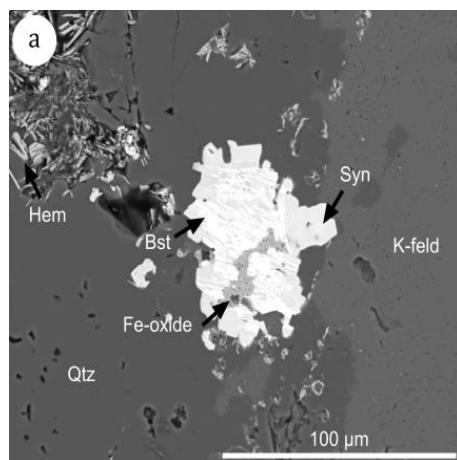
The Samphire granite at Blackbush West is extensively altered with a complex overprinted sequence of disseminated, vein and replacement events. There is prominent **synchysite** ( $\text{Ca}(\text{Ce}, \text{La})(\text{CO}_3)_2\text{F}$ ) and **bastnäsite** ( $((\text{Ce}, \text{La})\text{CO}_3\text{F})$ ) and lesser **coffinite** ( $\text{U}(\text{SiO}_4)_{1-x}(\text{OH})_{4x}$ )



(a) Coarse pyrite (Pyr) with significant fracturing and pore space filled with coffinite (Cof.). Coffinite veins also fill fractures in quartz (Qtz). pp28.



(d) Intense alteration of a biotite lath with rutile developed along grain boundaries. Coffinite forms a thick rim about this mineral and breaches into the grain along fracture/cleavage. pp28



(a) Coarse, anhedral synchysite displaying thin lamella of bastnäsite. An inclusion within this grain contains a silica-bearing Fe-oxide signature – probably an intergrowth of quartz and hematite/magnetite. The grain is located on the contact of porous quartz with acicular, vein hematite and dusty K-feldspar. pp26

Source - *The Samphire Project: A distal IOCG and evidence for Mesoarchean crust in the Gawler Craton.* S. D Goldsmith 2014. Honours Project. Adelaide University.

## BLACKBUSH deposit – *the next discovery opportunity*

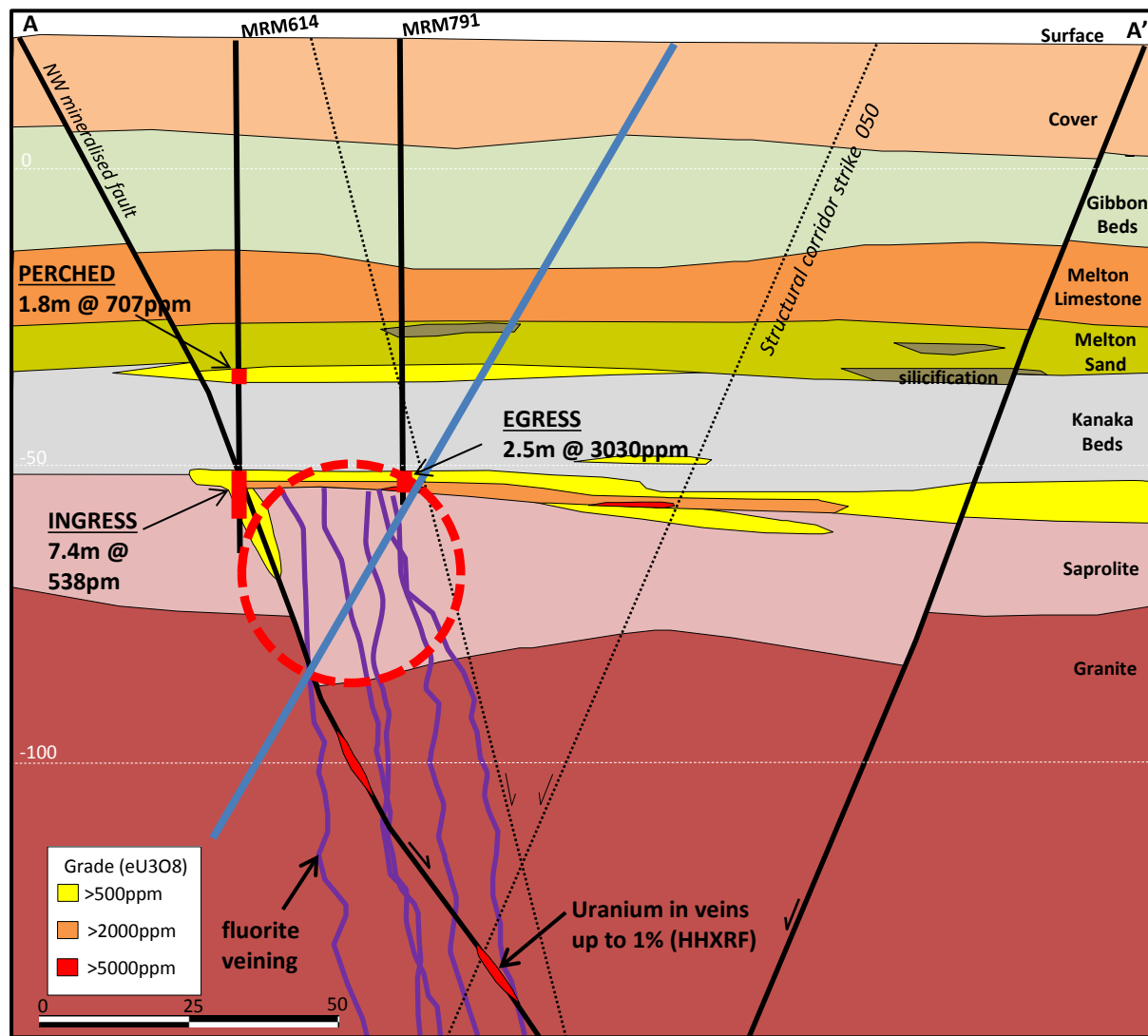
Systems modelling of the mineralisation indicates a very clear potential for the discovery of high grade mineralisation ( $>1\%$   $\text{U}_3\text{O}_8$ ) associated with the basal Eocene unconformity and the underlying source rocks and structural feeder systems at Blackbush West

High grades have already been drilled in sediment-hosted blankets along the unconformity, and in clay-altered structures in granite. **The objective is to connect known mineralisation into coherent, continuous and high grade bodies similar to those found in Archean unconformity deposits**

Targeting for discovery of new styles of high grade mineralisation in Blackbush West has focussed on the 42N and 38N prospect area where there are:

1. blankets of sediment-hosted high grade mineralisation at the basal unconformity. This is readily available for the existing exploration/delineation drilling data
2. underlying intensely altered and mineralised Samphire granite. Hand held XRF on end-of-hole samples defines areas with elevated Ca as a proxy for synchysite ( $\text{Ca}(\text{Ce},\text{La})(\text{CO}_3)_2\text{F}$ ) and associated U
3. mineralised structures penetrating basement and Eocene/Miocene cover. Some are evident in the geophysical data (alteration?). Others have no geophysical signature (channel bounding fault escarpments)
4. silicification in the Eocene/Miocene sections. Possible alteration associated with fluid circulation

## BLACKBUSH deposit – the 42N prospect (section 6324250 N, view north, scale as shown)



Significant high grade uranium mineralisation is known from rotary mud holes and cored tails. Grade shells are shown lower left

The known uranium has been interpreted in a systems model framework as basement hosted “ingress” type, unconformity confined “egress” type, and up-structure “perched” type, all associated with a penetrative structure with high grade uranium veins in basement

Granite basement is clay-altered & uranium/synchysite mineralised

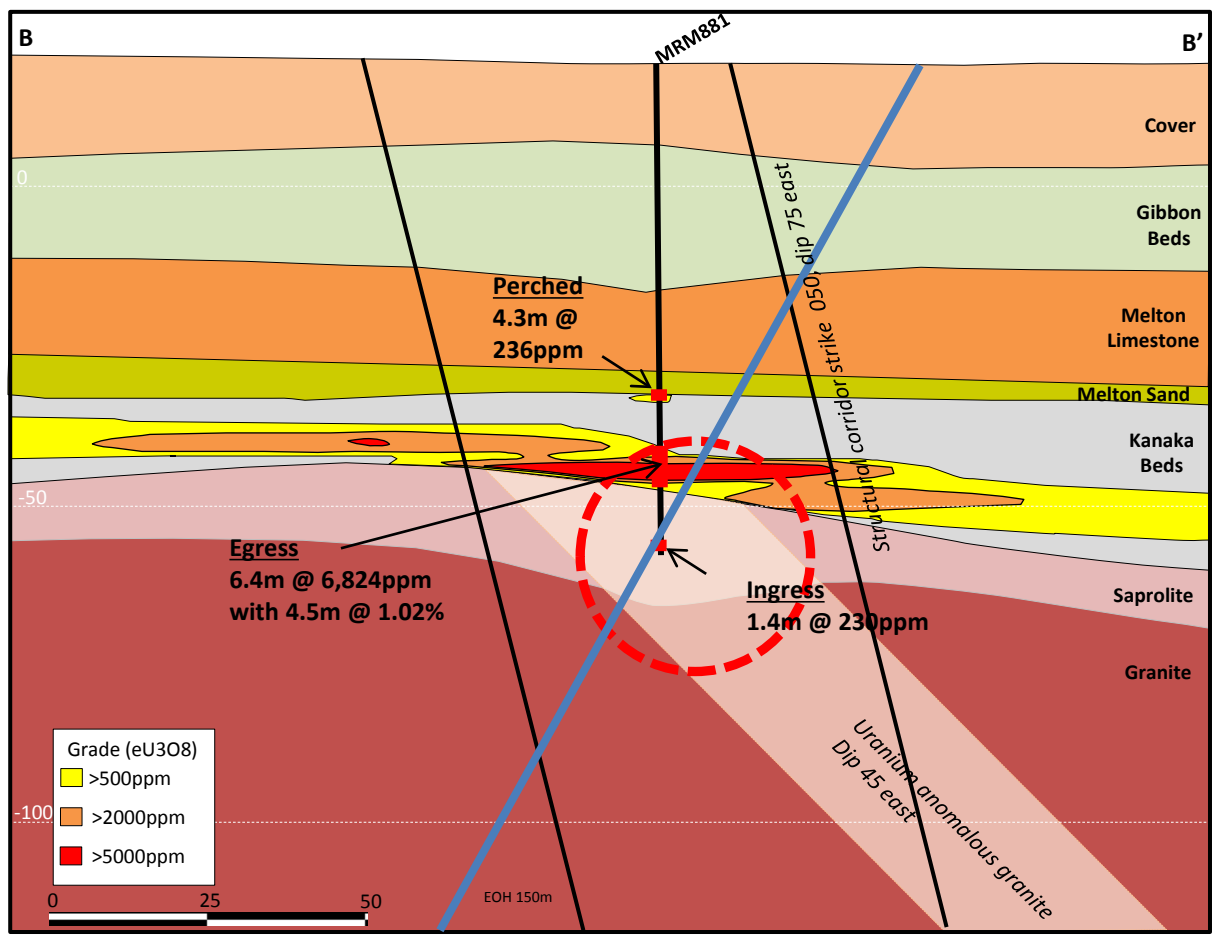
**60° inclined core hole targeted at:**  
coincident high grade blanket of sediment-hosted mineralisation overlying altered/mineralised granite: both the unconformity and basement are cut by sub-vertical uranium/fluorite veined structures.

Prospect location is shown in previous figure 8

**UraniumSA**



**BLACKBUSH deposit – the 38N prospect** (section 6323878 N, view north, scale as shown)



60° inclined core hole to ~150m (blue trace)

High grade uranium mineralisation in rotary mud holes. Basemen chemistry from HH-XRF of end-of-hole samples. Grade shells are shown lower left

The known uranium has been interpreted in a systems model framework as basement hosted “ingress” type, unconformity confined “egress” type, and up-structure “perched” type.

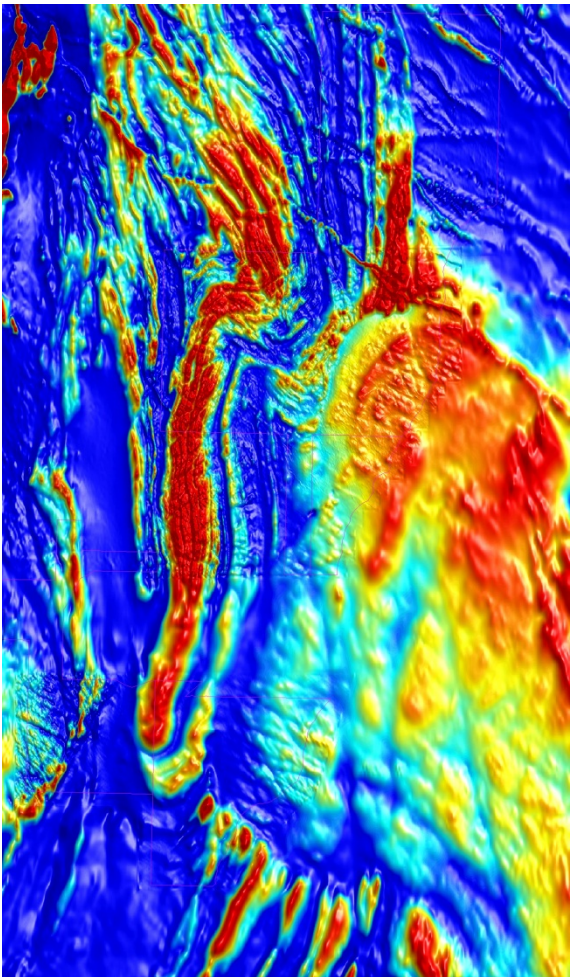
Granite basement is clay-altered, uranium anomalous and inferred from HH-XRF geochemistry to be synchysite and fluorite mineralised

**60° inclined core hole targeted at:** coincident blanket >1% sediment-hosted mineralisation overlying strongly altered/mineralised granite which is interpreted as layered and east dipping.

Prospect location is shown in previous figure 8



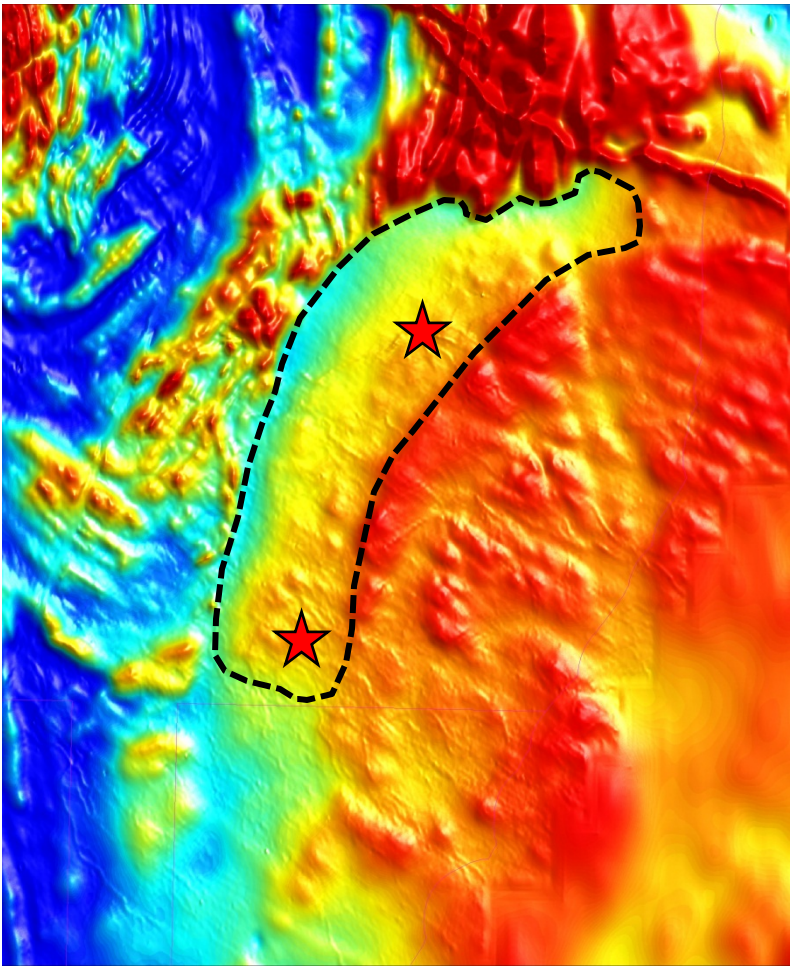
# SAMPHIRE project – *future opportunity* – the Samphire batholith



The Samphire batholith is a composite sequential granite intrusion with syn and post emplacement structures and alteration

It is ~35km north-south and USA exploration tenure covers its on-shore extent

The Blackbush and Plumbush deposits occur within the north-western arcuate zone which is fractionated, uranium enriched and ~10km long



## **OUTLOOK FOR 2015 – *key points***

**Uranium price - recovery is sustainable and should rise above US\$50  
market sentiment and support for uranium will improve**

**Samphire project - has a good drilled out uranium endowment  
- exploration/development will increase tonnes/grade**

**UraniumSA - will continue, running lean and extract value for  
shareholders from the Samphire Project**





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