### RESPOND FASTER, MAKE BETTER DECISIONS







iAWARDS 2021 SA/NT WINNER









# **ABOUT AirborneLogic**

### **OUR MISSION**

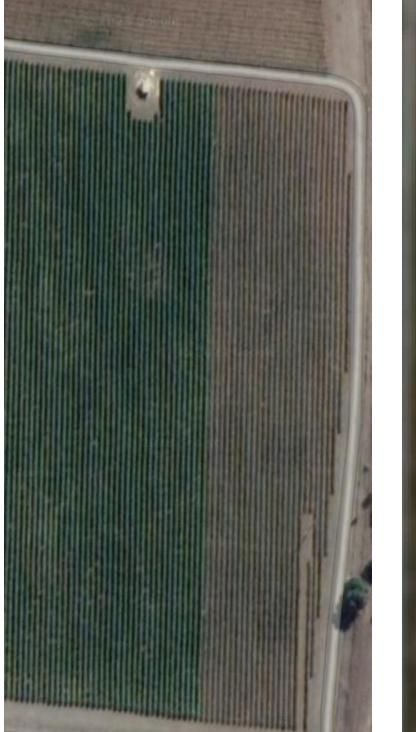
Helping growers effectively use time, money and resources to grow better crops and adapt and respond to climate change

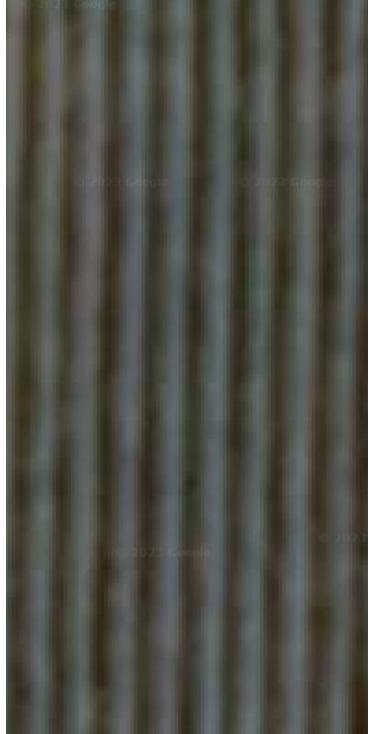
### **OUR FOCUS**

- DETAIL (helping you locate/count whats hard to see) - SERVICE (+30 years working with agriculture)

EXPERTISE (helping you get to most from your data)

### **SAME LOCATION:** GOOGLEEARTH-10M PIXELS









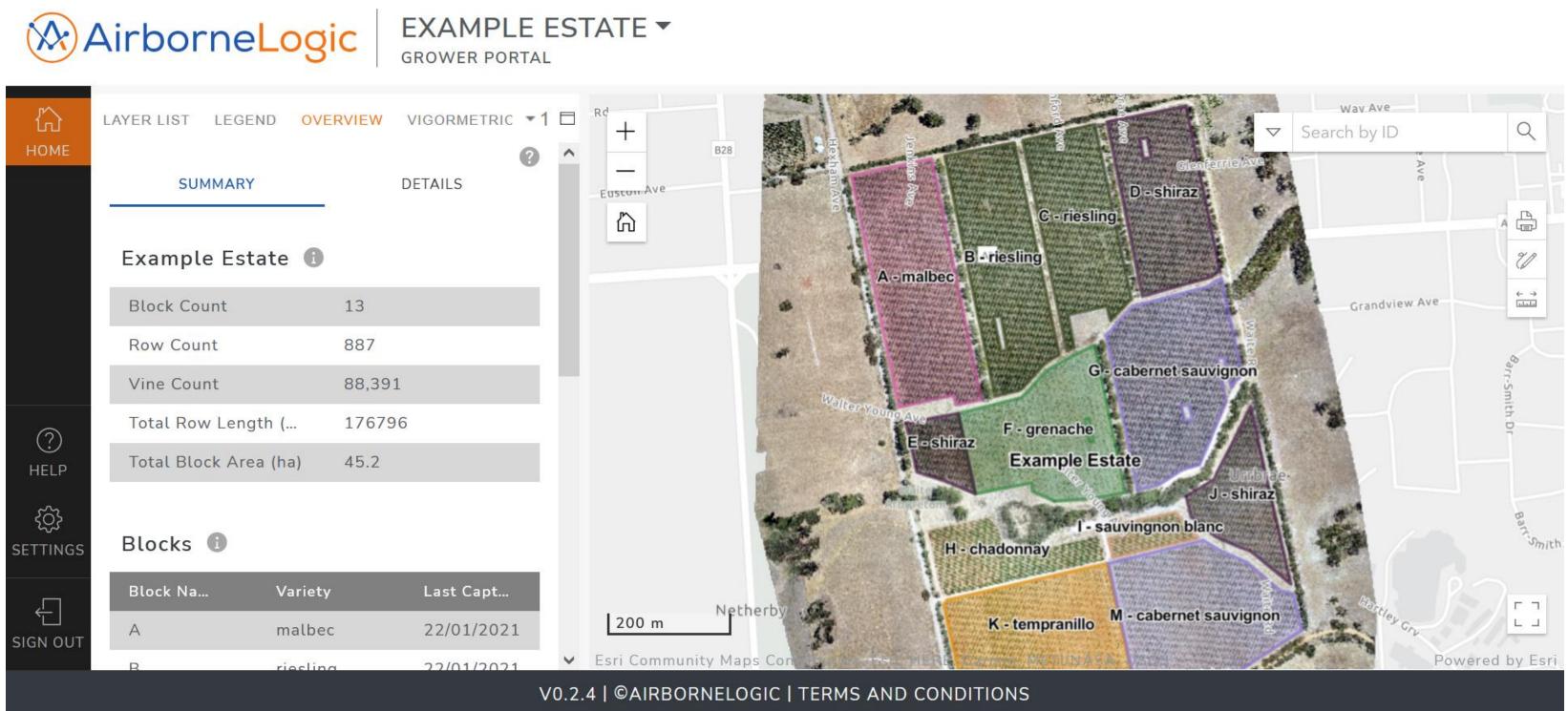
#### Drones/planes can collect high detail imagery and remote sensed data on demand that can ...

- Detect and display things that are hard to see
- Accurately locate/measure/count/analyse/report...... objects/detail/change over time
- Helpyou navigate straight to problem areas or points of interest (ala Google maps)

#### P1-1CM PIXELS

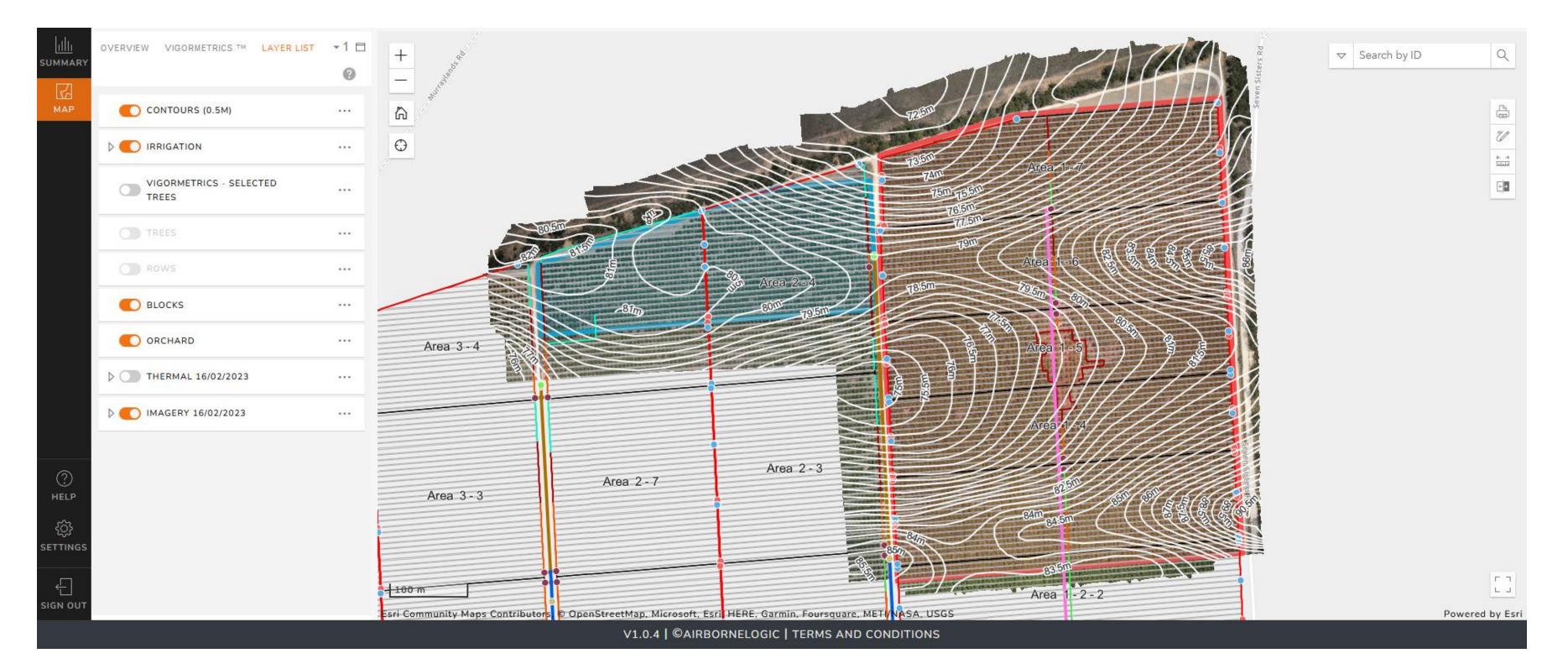


# **RGB** - Asset labelling, location and stock take (desktop and handheld)





## **RGB - Map land features & infrastructure**

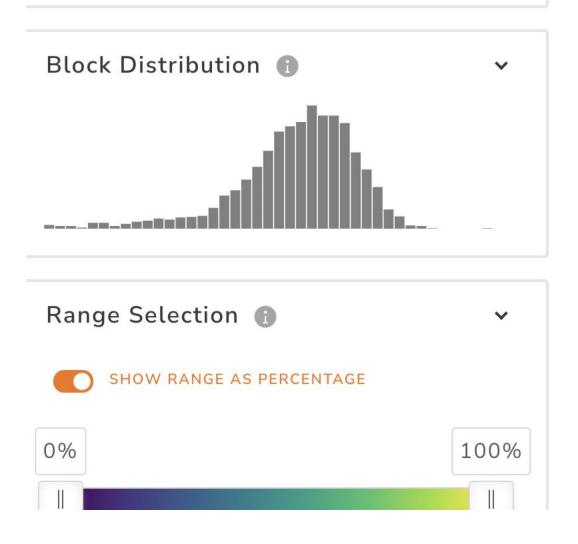


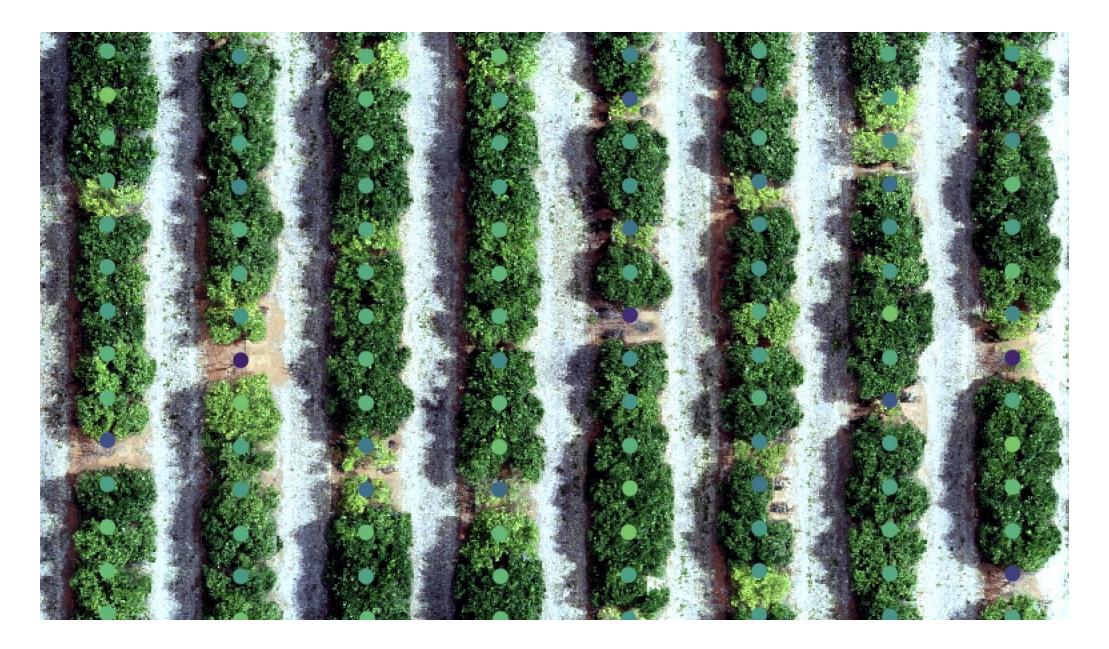
### GROWER PORTAL, DETECT PROBLEM AREAS, EASY ACTION



## RGB Sensors - PLANT COUNTS, CANOPY UNIFORMITY, GAPS, "Change over Time"

Tree Count	
Vine Count	2,544
Total (m²)	11,755
Min (m²)	0
Max (m²)	8.08
Average (m²)	4.62
Standard Deviation (	1.09





Tree/missing count, uniformity (height/volume/area), disease (visual/spectral)

## Multispectral sensors- Plant health, nutrition and disease

- Grading quality
- NDVI/Greeness used to

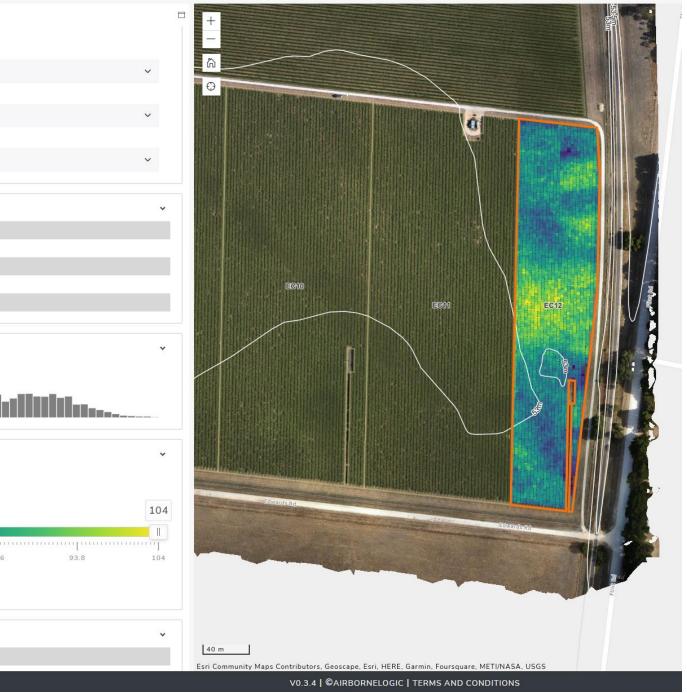
assess variability

- Confirmed via spot sampling
- Records kept to evaluate

impact/compare next season

OVERVIEW	VIGORMETRICS TM	LAYER LIST	LEGEND	
Blo	ck:			
F	C12			
Dat				
	9/01/2023			
Met	tric:			
G	reenness			
Bloo	ck Summary 🖪			
Vine	Count			3,599
Min				53
Max				104
Aver	rage			80.31
				8.38
	dard Deviation	0	.ah	
		• 	att	
Bloo			الله	
Bloo	ck Distribution	<b></b> D		
Bloo  Ran	ck Distribution	<b></b> D		
Bloo	ck Distribution	<b></b> D		
Bloc Ran 53	ck Distribution			
Bloc Ran 53	ck Distribution	Dercentage		
Bloc Ran 53 II	ck Distribution	D PERCENTAGE		
Bloc Ran 53 1	ck Distribution	2 SULTS		

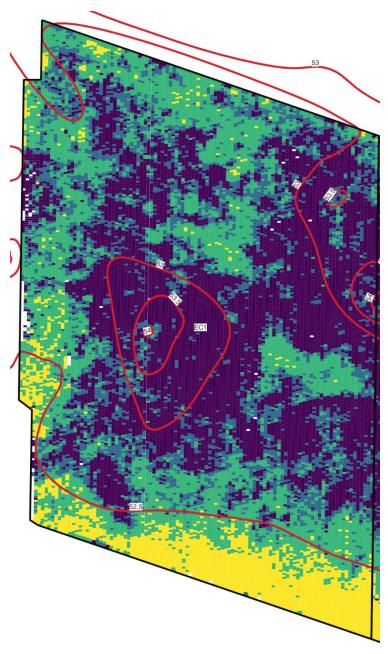




## **ACTIONABLE INSIGHTS**

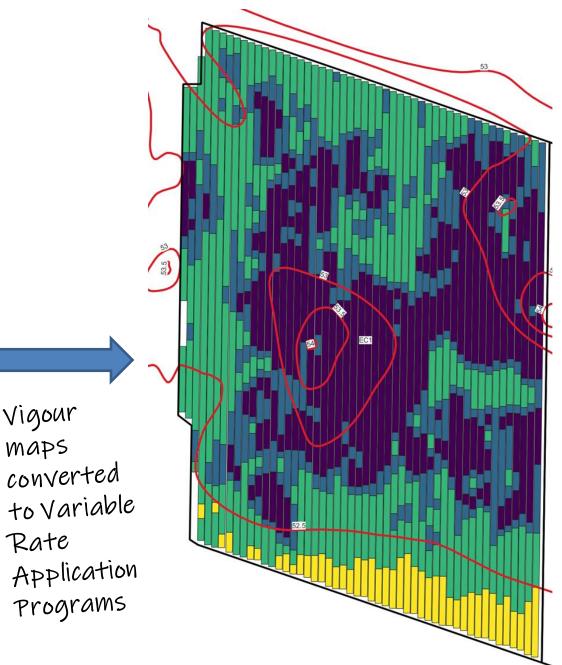
➢ Automated variable rate applications maps for mulch/compost





Vigour maps converted Rate

- \_
- —



Records kept to evaluate impact/compare next season Block boundaries can be used to turn on/off spray units etc

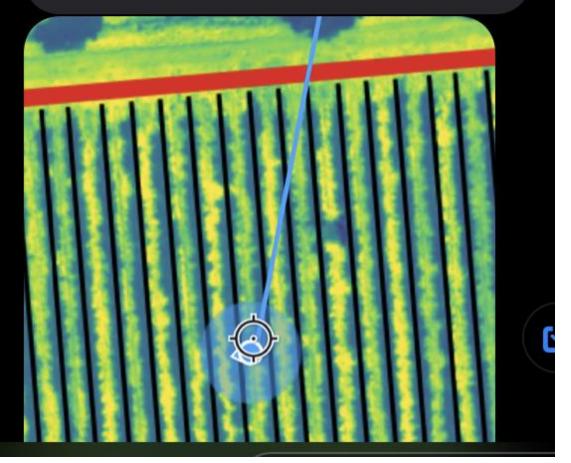
## ACTIONABLE INSIGHTS – Targeting leaks

- Self flown mission
- 26 leaks and blown risers located/fixed
- Workload reduced from 16 to 5 hours (more optimization possible)
- + variability assessments/counts etc





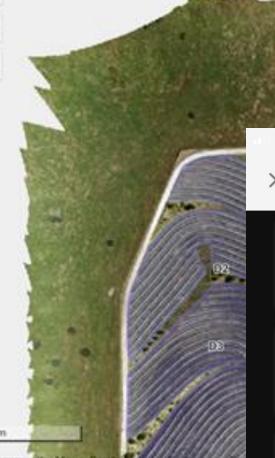
Hi Dan and Mike. I have ground truth the map with Avenza on a large and small leak. Large being a blown riser and the small being a missing dripper. Both took me within <u>3m</u> of the leaks. Cheers Chris



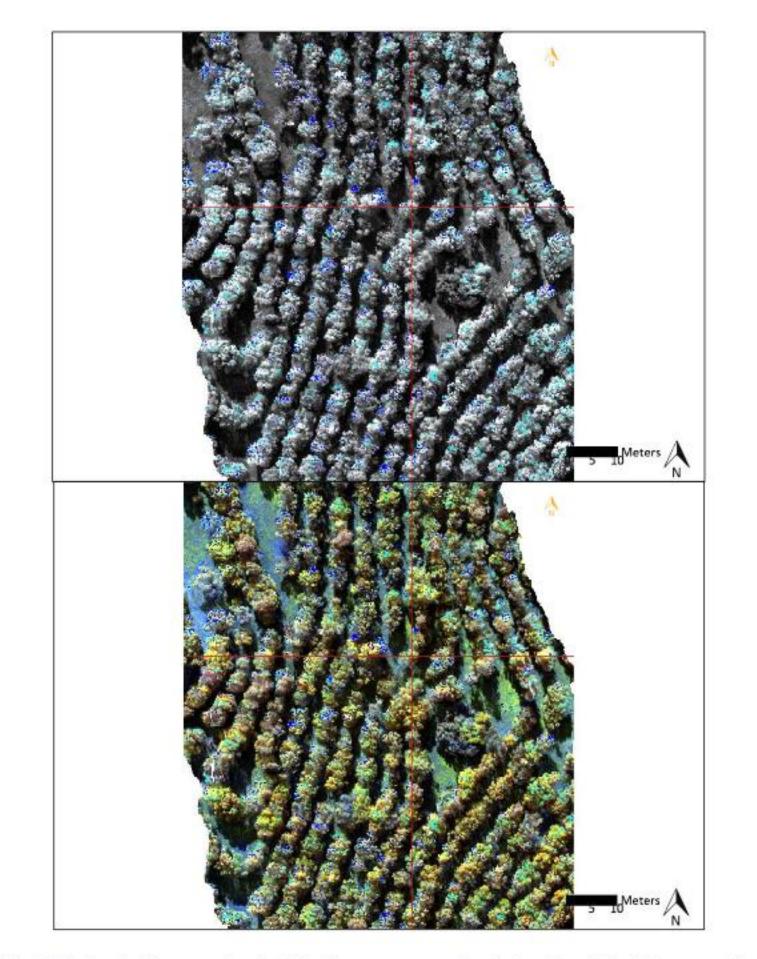
## FAST SCOUTING + Accurate record Keeping

- Portable maps (ala
  - Google Maps)
- Add-on Apps
- Digitized record
  - keeping

d BACK	Q ZOOM TO
Field Notes (Points	s) - Drone tak 🎽 📵
Name	Drone takeoff
Category	2
Comments	Testing
CreationDate	02/12/2022
Creator	haydn_airbornelogic
EditDate	02/12/2022
Editor	haydn_airbornelogic
Attachments @	







# PLANT ID, USING HYPERSPECTRAL IMAGING

Figure 14 - ACE classified tree species discrimination: cyan areas: Eucalyptus diversifolia; Blue areas: Eucalyptus leucoxylon. Top: greyscale backdrop image of band 834nm, Bottom: false colour composite wavebands (446nm, 716nm, and 834nm).

SPECIES DETECTION, SPECTRAL SIGNATURE



### OPTIONS

- We Fly
  - Large selection of High precision instruments (cameras, thermal, hyper and multi-spec sensors)
- You Fly
  - Share a drone
  - Fly when you want
  - Reduced cost over time
  - Use for other purposes
- Quick turn-around





### **COST OPTIONS**

Processing packages include:

- Set-up support
- Bulk discount \_
- RGB with thermal or multi \_
- Assistance with file conversion for other use

(e.g. GIS, Tracmaps, spray units, self-drive

machinery etc)



#### **Pricing List and Options**

Assistance with drone purchase	Provide
Grower portal licence	
Field Maps App	
AirborneLogic property base mapping set up	Bas
Fly Your Own (RGB+Thermal)	Proces • Sing • 2-4 f • 5+ fli
Fly Your Own (RGB+Multi)	Proc • Sing • 2-4 f • 5+ fli
Repeat flights by AirborneLogic	
Repeat flights by AirborneLogic	

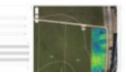
#### PLANT COUNTS, CANOPY UNIFORMITY, DISEASE

Same County			
time ( north	1.5.44		
Security and	13.795		
10 at 10 at 10	+	200 TO 100	
No. 14-71	1.04	100 M	2 12 2 1
Average In-N	1.62		
hariant havini	-1-100		
Reek Distribu	for 0	· 112	
	- day	100 314	

Description	Cost (Excl GST)
e advice and assist with selection of drone/s – assist securing discount from suppliers	\$500
12 months subscription (+ support) annual	\$1,600
12 months subscription (+ support) annual	\$550
se map set up and load to portal ready for repeat flights by either AirborneLogic or "Fly your own"	\$35/HA
as RGB and Thermal image data, load to portal and provide analytics gle flight flights ights	<ul> <li>\$15/HA</li> <li>\$13/HA</li> <li>\$11.50/HA</li> </ul>
cess RGB and multispectral image data, load to portal and provide analytics flight flights ights	<ul> <li>\$18/HA</li> <li>\$15/HA</li> <li>\$13.50/HA</li> </ul>
RGB and Thermal, flown + loaded to portal	\$24/ha
RGB and Multispectral, flown + loaded to portal	\$27/ha

#### ACTIONABLE INSIGHTS - Targeting variability

- Grading quality
- NDVI/Greeness used to
- assess variability
- Confirmed via spot sampling





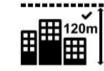
### CONSIDERATIONS

- Drone types and sensors (what fits your needs?)
- Get trained (RePL) ~ 4 days (+\$1800) •
- Talk to CASA (When a ReOC is required) •
- Ethics consult with your neighbors to avoid any •

issues







You must not fly your drone higher than 120 metres (400 feet) above ground level.



You must not fly over or above people or in a populous area. This could include beaches, parks, events, or sport ovals where there is a game in progress.



Remember, you must not operate your drone in a way that creates a hazard to another aircraft, person or property.

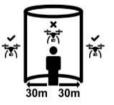


**Civil Aviation Safety Authority** 



#### Z IMPORTANT **DRONE SAFETY** INFORMATION





You must keep vour drone at least 30 metres away from other people.



If your drone weighs more than 250 grams, you must fly at least 5.5 kilometres away from a controlled airport, which generally have a control tower at them.



If you're near a helicopter landing site or smaller aerodrome without a control tower. you can fly your drone within 5.5 kilometres. If you become aware of manned aircraft nearby, you will have to manoeuvre away and land your drone as quickly and safely as possible.





You must keep your drone within visual line-of-sight. This means always being able to see the drone with your own eyes (rather than through a device, screen or goggles).



You must not fly your drone over or near an area affecting public safety or where emergency operations are underway. This could include situations such as a car crash. police operations, a fire or firefighting efforts or search and rescue.



If you intend to fly your drone for or at work (commercially), there are extra rules you must follow. You will also need to register your drone and get a licence or accreditation.

0



Respect personal privacy. Don't record or photograph people without their consent -this may breach other laws.



You must only fly one drone at a time.



You must only fly during the day and you must not fly through cloud or fog.

#### >>> KNOWYOURDRONE.GOV.AU

### **OUR EXPEREINCE**

- Flying since 2019
- >100 missions
- Tested many variables, sensors, processing methods

### <u>TIPS</u>

- Check local air traffic
- Draw flight plans before onsite
- Make sure you use RTK (do your research on service and correction streams <u>STARLINK</u>)
- Watch out for birds!!





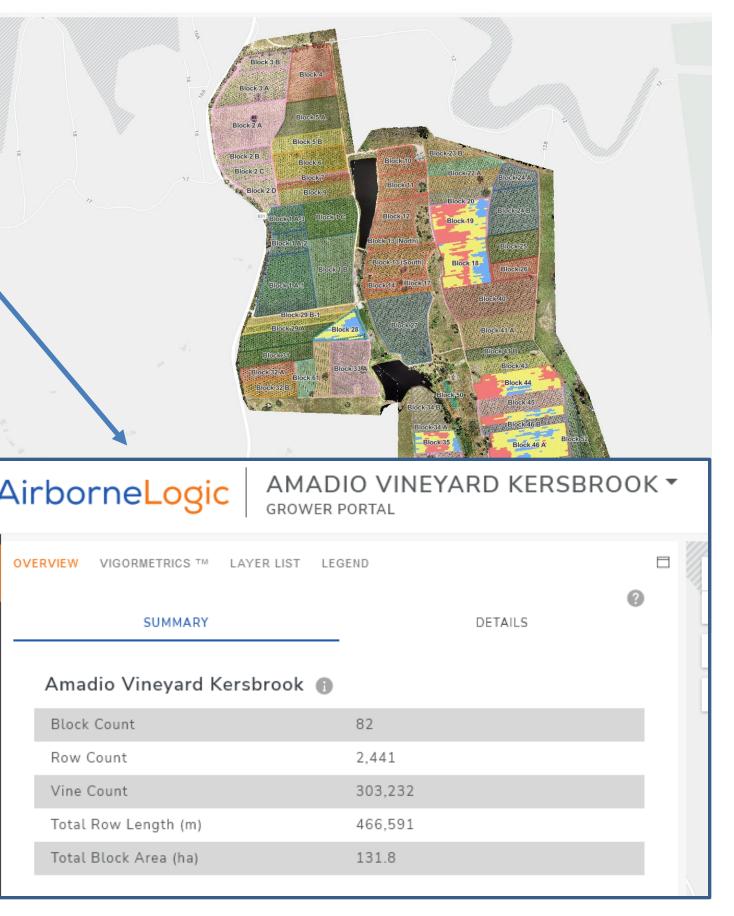


## CASE STUDY - AMADIO

### ACCURATE VINE COUNTS PROVIDE 80% ROI ON COST OF DATA CAPTURE ALONE

- Ability to separate out individual vines used to update area under production statistics
- New vine counts amount to +7000 less than originally recorded
- Results ground-truthed in multiple regions throughout the vineyard
- Total savings in pruning costs ~ \$5 700
- Further ROI achieved via optimal application/spreading of compost to most "in-need" areas + targeting low producing vines
- Improved ability to review vineyard status remotely (offices are ~ 80 km away) – better joint decision-making ability with the client

(X) A	Airborne <mark>Lo</mark> g	gic AMAD GROWER F	IO VINEYA Portal	ARD KERSBRC	OK •	
Ю НОМЕ	OVERVIEW VIGORMETRICS		GEND	DETAILS	0	+
	SUMM/	AR 1		DETAILS		G
	Amadio Vineya	rd Kersbrook 🚯				C
	Block Count		82			
	Row Count		2,441			
	Vine Count		303,232			
	Total Row Length (	m)	466,591			
	Total Block Area (h	a)	131.8			
	Blocks 🚯					
	Block Name	Variety	Last Capture	Capture Count		
	Block 1 A-1	cabernet sauvi	17/03/2022	1		
	Block 1 A-2	cabernet sauvi	17/03/2022	1		
	Block 1 A-3	cabernet sauvi	17/03/2022	1		
	Block 1 B	sauvignon blanc	17/03/2022	1		
	Block 1 C	pinot gris	17/03/2022	1		
	Block 10	pinot noir				
	Block 11	pinot noir				
	Block 12	pinot noir				
	Block 13 (North)	pinot noir				
	Block 13 (South)	pinot noir				
	Block 14	pinot noir	24/11/2022	1		
	Block 15	pinot noir	24/11/2022	1		
	Block 16	sangiovese	24/11/2022	1		
	Block 17	pinot noir	24/11/2022	1	— г	
	Block 18	chardonnay	24/11/2022	2		
	Block 19	nebbiolo	24/11/2022	2		(XX)
	Block 2 A	shiraz	17/03/2022	1		$\smile$
?	Block 2 B	shiraz	17/03/2022	1		
HELP	Block 2 C	shiraz	17/03/2022	1		
ŝ	Block 2 D	shiraz	17/03/2022	1		ஸ்
१२२४ TTINGS	Block 20	nebbiolo	24/11/2022	2		НОМЕ
	Block 21	pecorino	24/11/2022	2		HOME
€ N OUT	Block 22 A	fiano	24/11/2022	1		
1001	Block 22 B	fiano	24/11/2022	1		



## CASE STUDY - HILL RIVER CLARE ESTATE

### 3 YEARS - 2020-23

200 Ha survey - conversion from paper to digital maps, seasonal canopy analysis + assessment of "change over time"

### PORTAL DEVELOPMENT

### Collaboration/support partnership

### BENEFITS

### <u>- Reduced time/increased accuracy</u> <u>targeting low productivity areas (></u> <u>productivity by 10T)</u>

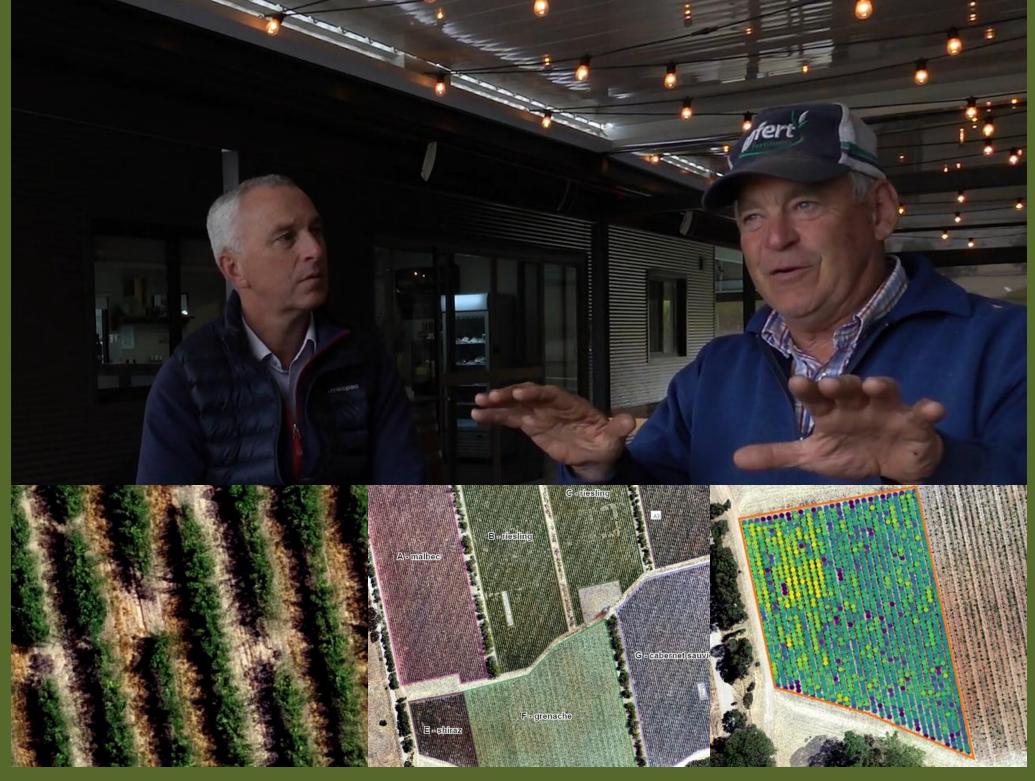
- Increased precision in locating problems (workload reduced from days to 1 hour)

- Improved reporting for bank valuation

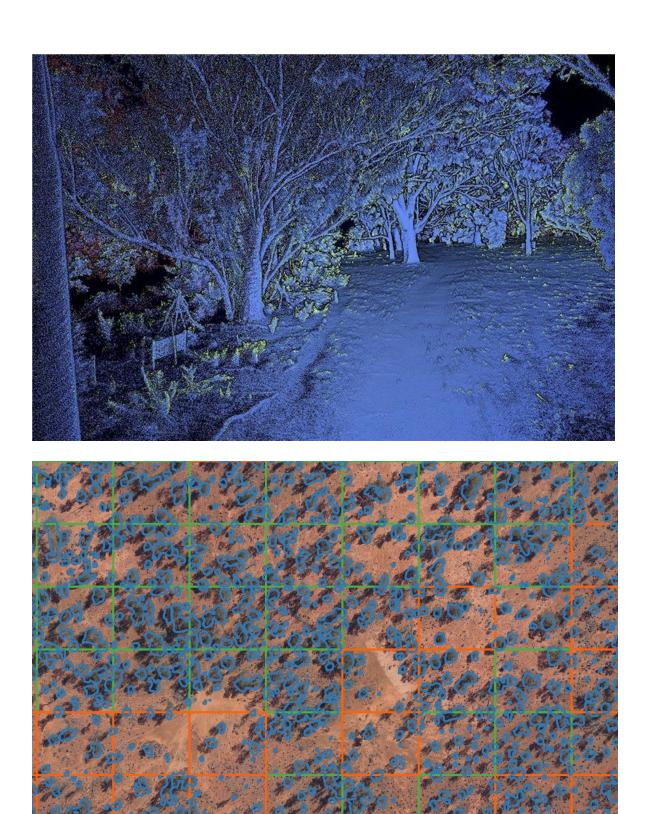
- -Reported improved decision making and time saved (yet to be quantified)
- Targeted support for tech adoption

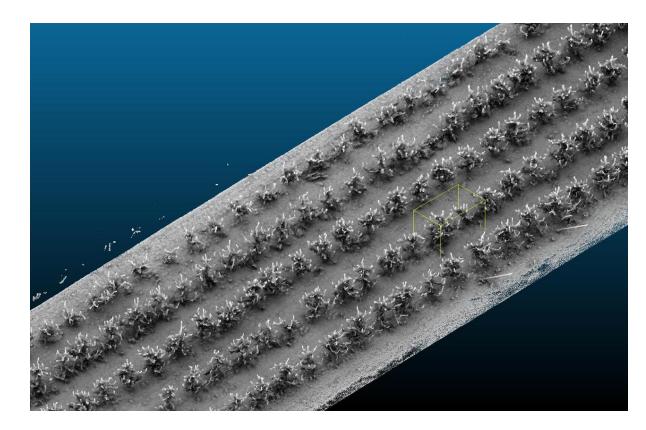
### READING BETWEEN THE VINES – EPISODE 6

https://www.wineaustralia.com/news/articles/reading



# **CARBON/BIODIVERSITY** - Accurate measurement for benchmarking + reporting

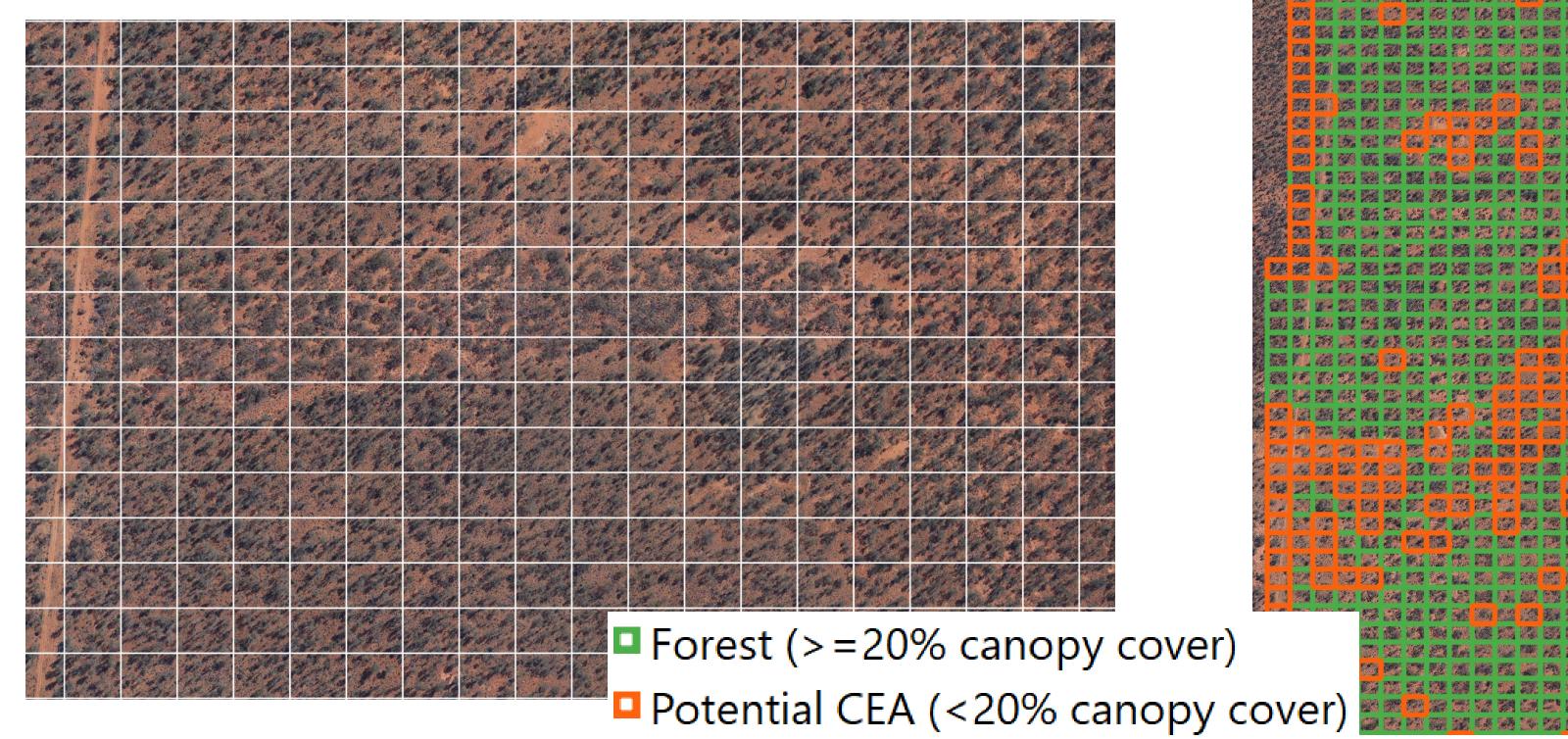








## **CARBON FARMING, GIS & SCRIPTING**

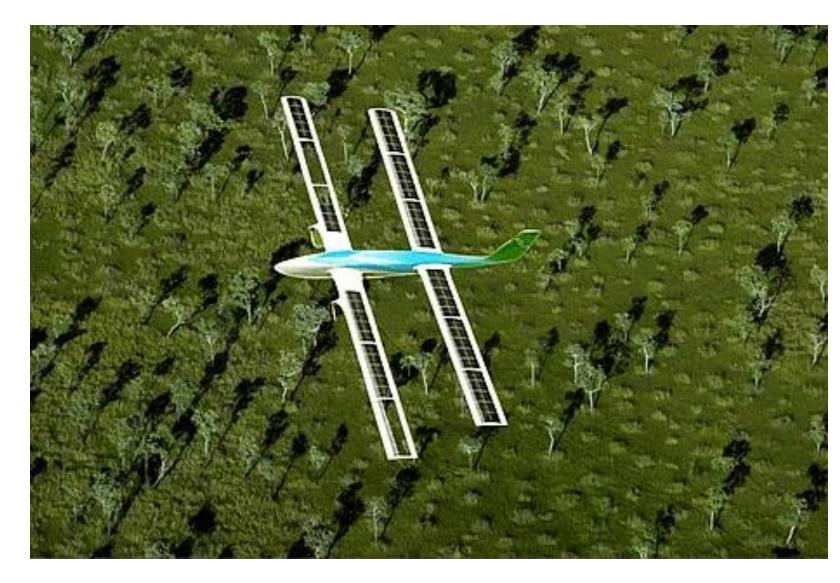




					2 Mar		10 A				A. A.				62		and a						
19					12.22														822				
														E.							122		1
See.		3					編集	and and a second se															A A A
		<b>1</b>			Real Property in				22			84											
												14.90											
				1	杨				<b>R</b>		600	R.											
	19. 19.			100							261			透光								24	
								527		5/3	P.S.										12A		E.
	<b>M</b>			22						1	-												
100	調業	20	Sir A		TH.	File		82						Z	Ree A								The state
						22	100	1	2													翻訳	L'AL
	加速	20.	8878) 1	32						W.									REE.	23	10月		195
	翻				13A	1728	17%		18Ca	122	and a	Part of				<b>17</b>	K	1300	Presented .		1200	調調	A RAN
1194		92 Z	之外	1		12	100	-							e et e							WE	
		5. S	Tr.	a all	12 and											1	222			-	and the second	Real Property	R
S.Z.	120	23			199	W.	20%	<b>1</b>	62	alle.		209				194	198		鄉派		1998		the second
C. Co		5	12		100			Cale		W.		19		20							開始		
Cont 1	1990	1.23			1922A	1			1990	22		1740						224					
38.2		1			575								122					1 and			And the second		「大学
		<b>清</b> 茶							100			1	1								Pro-		
	2000									12		1				100			ALC: N	RSS.			
2 X.8.	10			1000	1990 - Sec.						12									100			
		1000	222		5/54	E.S.		-			10								1983	10000000			1.23
		1715	1950		W.	1000	-		25		123	and the					THE.	22	1053	2200			e far
e aq		The second	NO.			-													TESTE			Real I	
	No.				-			1956		52			E.E.		222	Nonana a	影器		No.				-
			52				NA.		C.A.	1												19.4	
	18		100 M	1963	THE REAL		200									and the second		教授	E SA			al y	100
				Maria		N.M.	TC.	and and	Manual I							No.			Man.	NAME:		1	
	1981		7.985		1998a	1004	236		CALL S		anonient.	ARC LOS	STR. SPACE	CASH STREET									
		olare cantar 244	500			Marsh R	1	The second		10000	Carlos								El 25			AN A	110
STATE STATES	100000000	2007070	100000000	SCHOOL ST	NAMES OF B	Salata Bacore	- Andrewski -	TD SA		2992		C.S.				AND REAL		illes i		Mananae Mananae			
				1		22	and the second s	12 M	Ser.		Sector Sector		NOTES						R	ELACURA COMPACINA	P.C.		1
	A COMPOS			100.00	320	and an	Energy .	199		Contraction of the second									湖南		134		A. A.
	383			1815	1		100	223		No.											P de 1		
	9. P	199	1		1	See.	7.07	Contra Contra	535		an a	Part and	Contract Inc.								14	A COLOR	in a star
			A STATE	Se H	States.	100	97.9%		1. A.M.	P. 49		TORAL S				and a	an states	Till:		200	很	100	
			1	Contraction of the second					EESS.	ACCESSION A	EM S		The second		Rectand				Sec.		大学の		
				1		210			REAL REAL		200								1.0		All and	1	6 /1 4 / 4 /
	(HT) Calo	Carlo	Contraction of the second	6.336		222				MANE.										4 6.			(m)
	0140.000	1000000	North State			200		Taria Taria		RE 40										State of the second			4
											**************************************		536	Sources				7.00			4	10	
					1928	MEN	and the	教育			四二 二	114						C.A.	-		A state	*	
								TORN .		The second			532	1000		198		THE R		1	in the second		T TH
				100		Saccord and		A COLOR	1000 C	6 . e	23.	NIS	- Carlos		New Color			Landar .	REAL OF	New a	a and		C. C.
<b>^</b> \		\ <b>F</b>	1			The second	A ALT			No.	Contrast in			123	100000			See S	-	A PARTY	a feat a	49	11
٥V		1		THE REAL PROPERTY IN	TESTER .	Tation I	SCALE	No. 10	NE AL		Trans.	Con ant	Taria.	357	MPCS.	California de la composición d	REAL PROPERTY.	and the	in the second	Ser Harris	y a	and the	-

# WHAT'S NEXT ? CARBON & BIODIVERSITY

- ACCURACY AND VALIDATION
- ALAND MACHINE LEARNING
- o LARGE-SCALE, LOW-COST IMAGE CAPTURE
- O DATA FUSION RGB, LIDAR, HYPERSPECTRAL



### CAPTURE RSPECTRAL



## CONTACT US

### AirborneLogic

### ADDRESS

Room 108 ThincLab Waite Hannaford Building Waite Campus URRBRAE South Australia 5064

EMAIL dan@airbornelogic.com.au andy@airbornelogic.com.au

PHONE +61 (0) 400 759 245 (Dan French) +61 (0) 419 817 205 (Andy Chambers)

