



# Asbestos cement roof hotspots study

The asbestos cement roof hotspots project was commissioned to better understand the residential asbestos cement roofing legacy.

We tested and validated a mixed methods approach, combining urban analytics, high-resolution imagery, and machine learning to detect asbestos cement roofing in specific study localities.

Analytics allowed for the entire of Australia to be scanned (at the Statistical Area 2 or SA2 level), to rank localities for the predicted presence of ACMs anywhere in the home and the potential for disturbance, based on various socio-economic and property development factors.



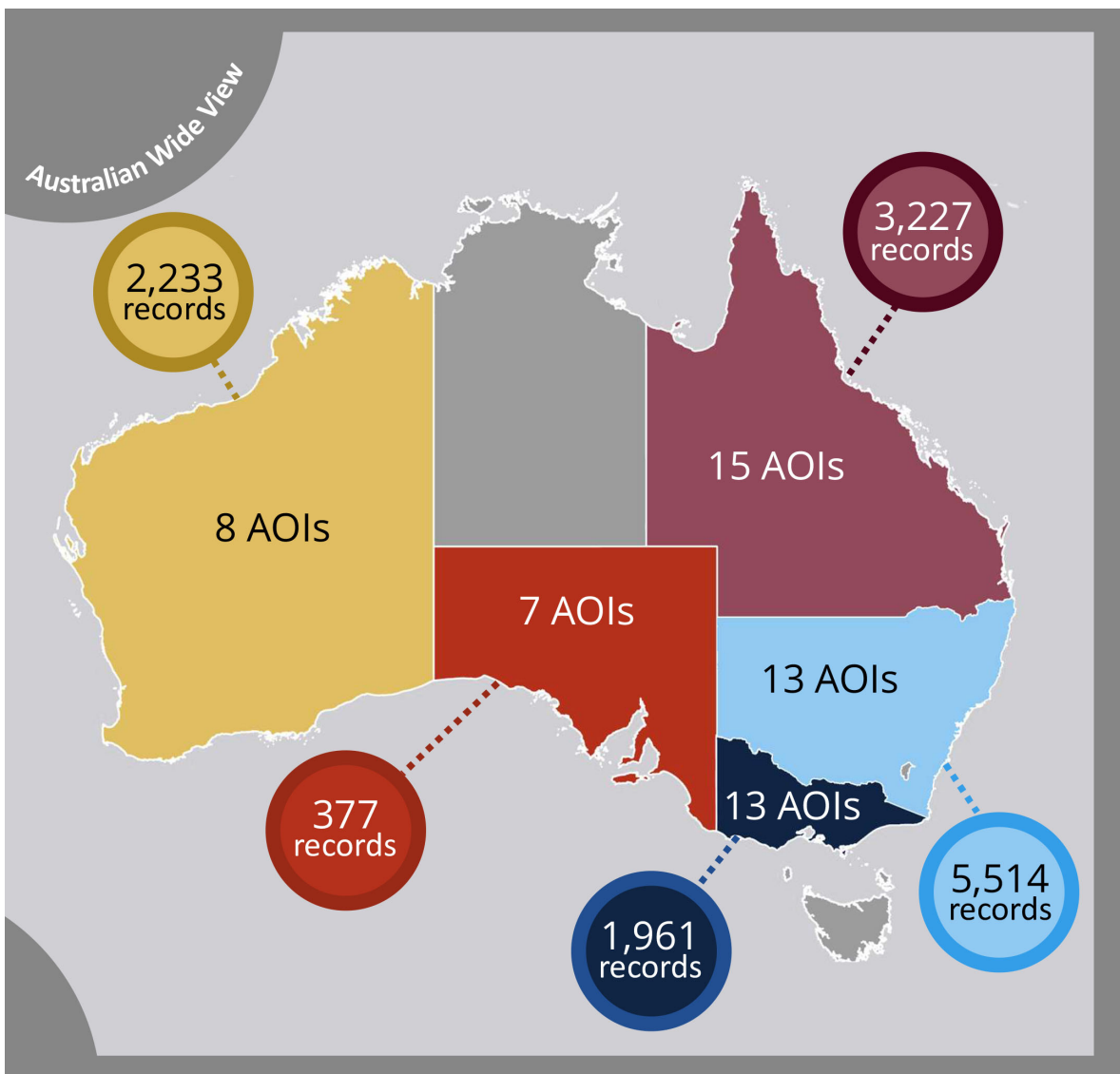
Asbestos National Strategic Plan

Implementation 2019–23

## Coverage



In this study, the highest ranked localities in NT, ACT and TAS did not reveal significant amounts of asbestos cement roofing and so these jurisdictions were excluded from further analysis.





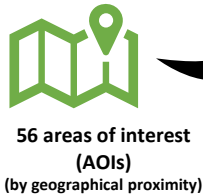
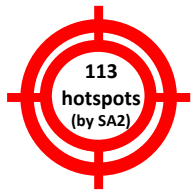
# Asbestos cement roof hotspots – summary

## RESULTS

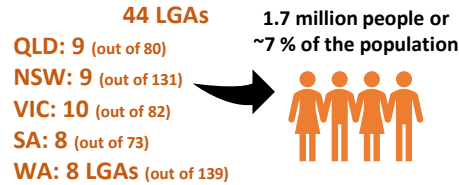
asbestos cement roof count = 13 312  
estimated waste volume = 23 105 t  
estimated waste area = 1 481 190 m<sup>2</sup>  
estimated waste in football fields = ~207



### COVERAGE



15 in QLD  
13 in NSW  
13 in VIC  
7 in SA  
8 in WA



### RESULTS



ROOFS DETECTED

AVG ROOF FOOTPRINT

DENSITY RANGE (average)



VOLUME

AREA (football fields)

AI MODEL ACCURACY

	QLD	NSW	VIC	SA	WA
ROOFS DETECTED	3227	5514	1961	377	2233
AVG ROOF FOOTPRINT	144 m <sup>2</sup>	84 m <sup>2</sup>	126 m <sup>2</sup>	143 m <sup>2</sup>	113 m <sup>2</sup>
DENSITY RANGE (average)	0.4–6.0 % (1.5 %)	0.7–5.9 % (2.9 %)	0.4–2.8 % (1.2 %)	0.2–1.6 % (0.5 %)	0.2–6.6 % (2.4 %)
VOLUME	7249 t	7225 t	3854 t	841 t	3936 t
AREA (football fields)	464 688 m <sup>2</sup> (~65)	463 176 m <sup>2</sup> (~65)	247 086 m <sup>2</sup> (~35)	53 911 m <sup>2</sup> (~7.5)	252 329 m <sup>2</sup> (~35)
AI MODEL ACCURACY	98 %	99 %	99 %	100 %	96 %



# Asbestos cement cladding – preliminary insights

## COVERAGE



qualitative trends about external wall cladding for 29 SA2s



external wall asbestos cement cladding prevalence estimates in 19 SA2s

6 in QLD  
3 in NSW  
3 in VIC  
3 in SA  
4 in WA



observations in ~0.8 km<sup>2</sup> of each SA2, covering a total of ~15 km<sup>2</sup> and 1505 dwellings

## RESULTS



Most commonly found in CBD fringing or coastal areas, with a double-pitched non-ACM roof



Commonly associated with:

- iron roofing
- vertical cladding cover strips



Commonly associated with:

- tile roofing
- horizontal cladding cover strips



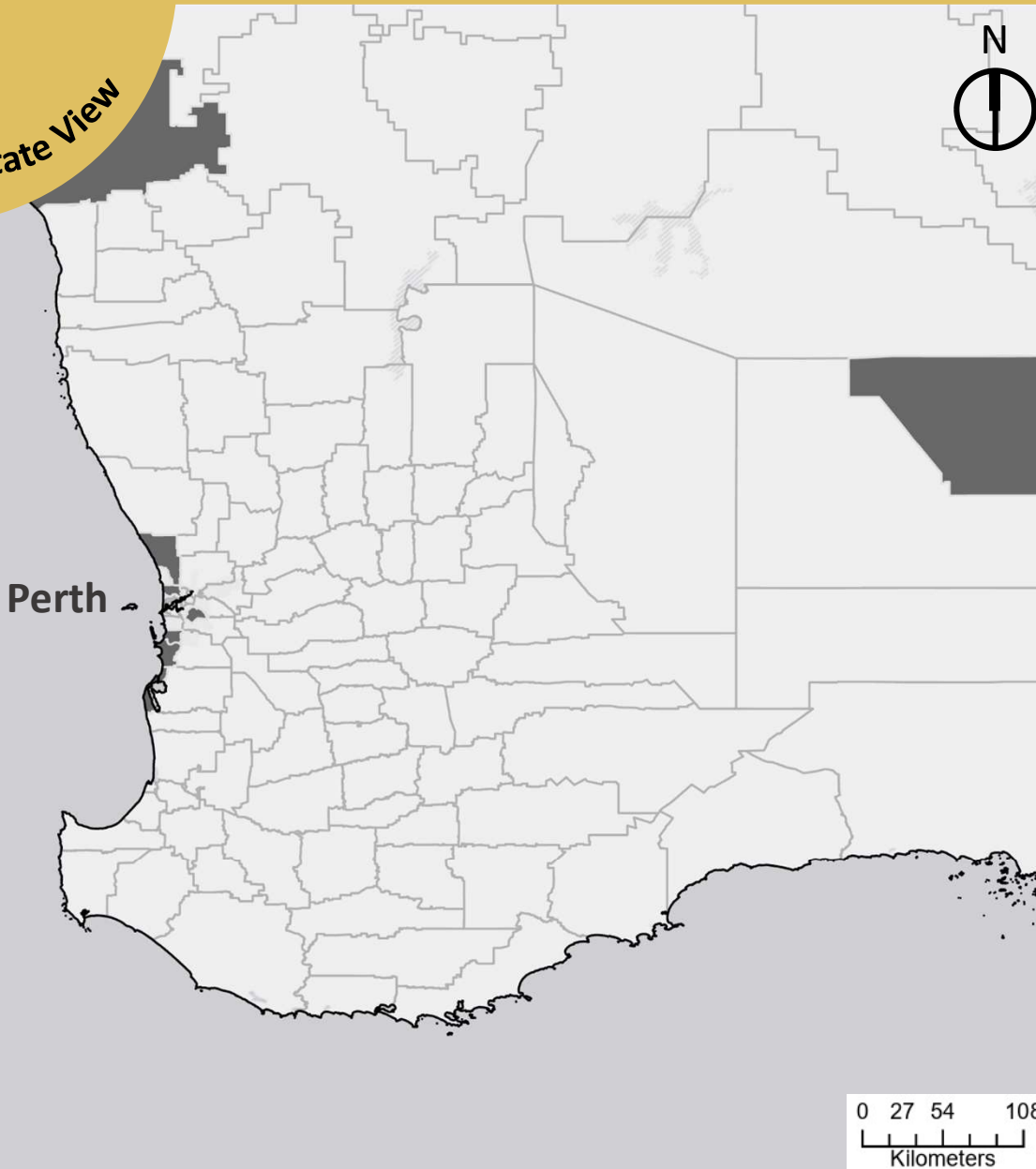
### ESTIMATED DENSITY

ACM roofing only : ACM roofing and cladding : ACM cladding only

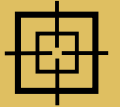
**3 : 1 : 6**

*for every 3 homes with asbestos cement roofing only, there is 1 more home with both asbestos cement roofing and cladding, and 6 more homes with external wall asbestos cement cladding only*

State View



Hotspots:  
8 LGAs



2,233  
Total  
Buildings

Accuracy



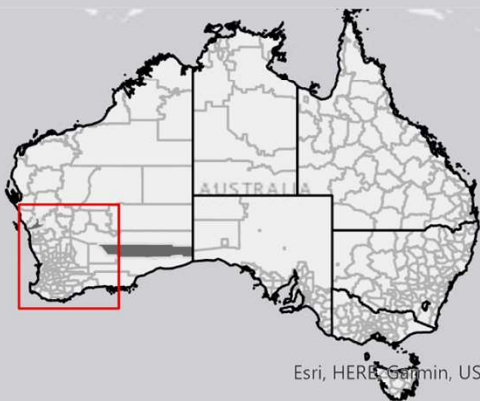
95%



8 Areas of  
Interest



138km<sup>2</sup>  
Hotspot  
area



Esri, HERE, Garmin, USGS

Legend

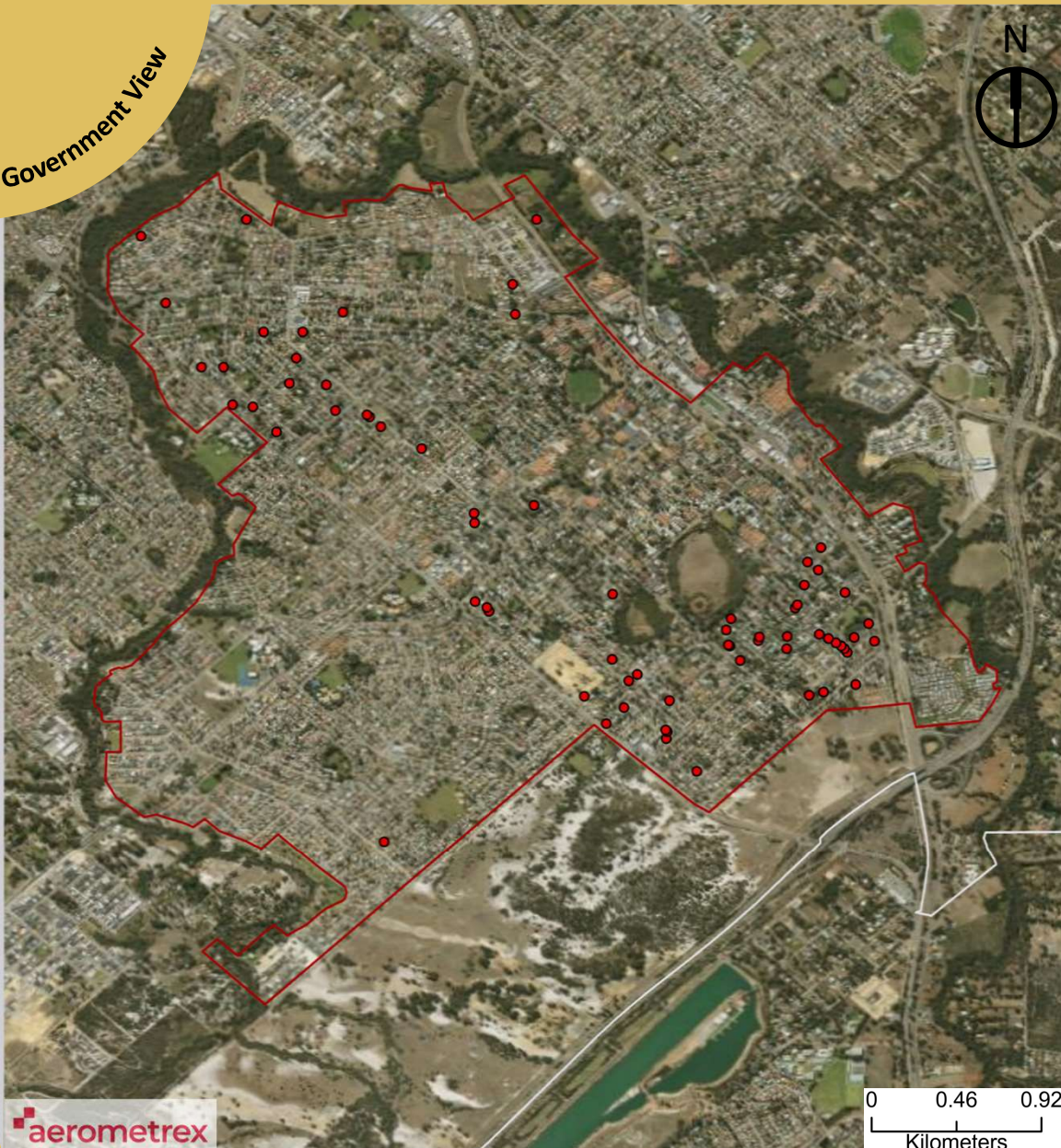
- Local Government Areas with Asbestos Hotspots (WA)
- Local Government Areas
- State & Territory Boundaries

Western Australia

Western Australia's asbestos roofing hotspots were identified in the Gosnells, Greater Geraldton, Kalgoorlie/ Boulder, Kwinana, Mandurah, Rockingham, Stirling, and Wanneroo local government areas. The Western Australia area of interests are distributed across 17 SA2s with a population of 205,645 persons in 2016. In total, 252,329 square metres of asbestos roofing were found in the state, which equates to 3,936 tonnes of ACM.

# Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



69 / 8,571 dwellings

ACM area



7,797m<sup>2</sup>

ACM mass



121.6 t

Density



Absolute: 0.8%  
Relative to avg. roof size: 0.8%

Aerial imagery

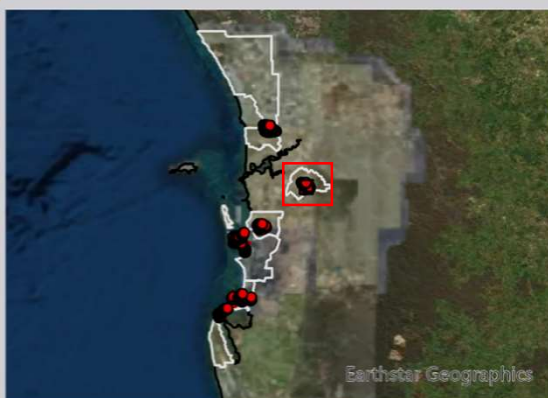


07/01/2021

Accuracy



96%



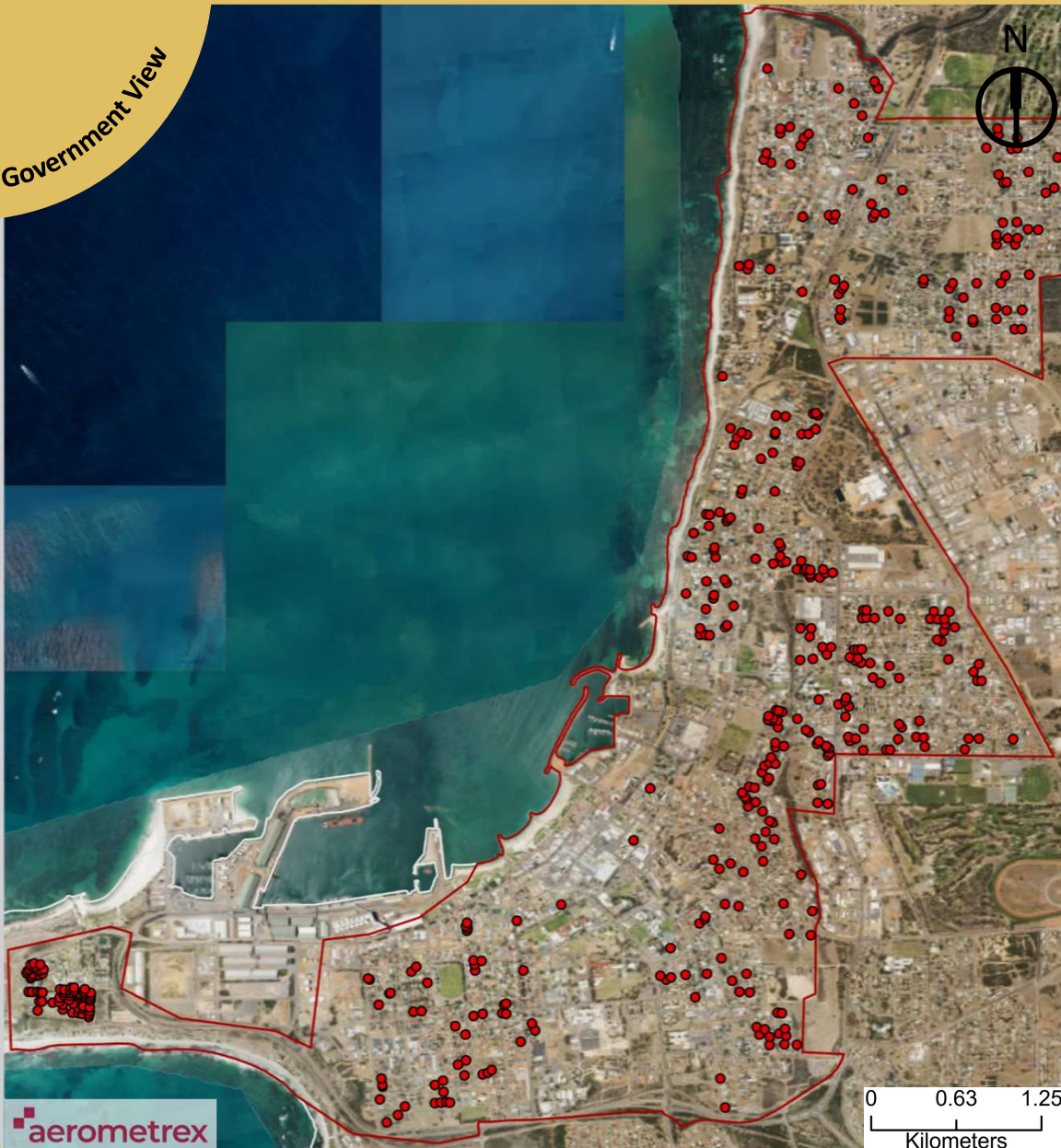
### Legend

- Roofs with Asbestos Containing Material
- Area of Interest Boundaries
- Local Government Areas with Asbestos Hotspots (WA)
- State & Territory Boundaries

## Gosnells – 10.3km<sup>2</sup>

The Gosnells area of interest is comprised of the 'Gosnells' SA2. This AOI covers an area of 10.3 square kilometres with a population of 20,282 in 2016, and projected growth of 4,840 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 32 degrees.

Local Government View



ACM roofing



426 / 8,062 dwellings

ACM area



48,138m<sup>2</sup>

ACM mass



750.9 t

Density



Absolute: 6.8%  
Relative to avg. roof size: 6.6%

Aerial imagery



02/12/2020

Accuracy



100%



**Legend**

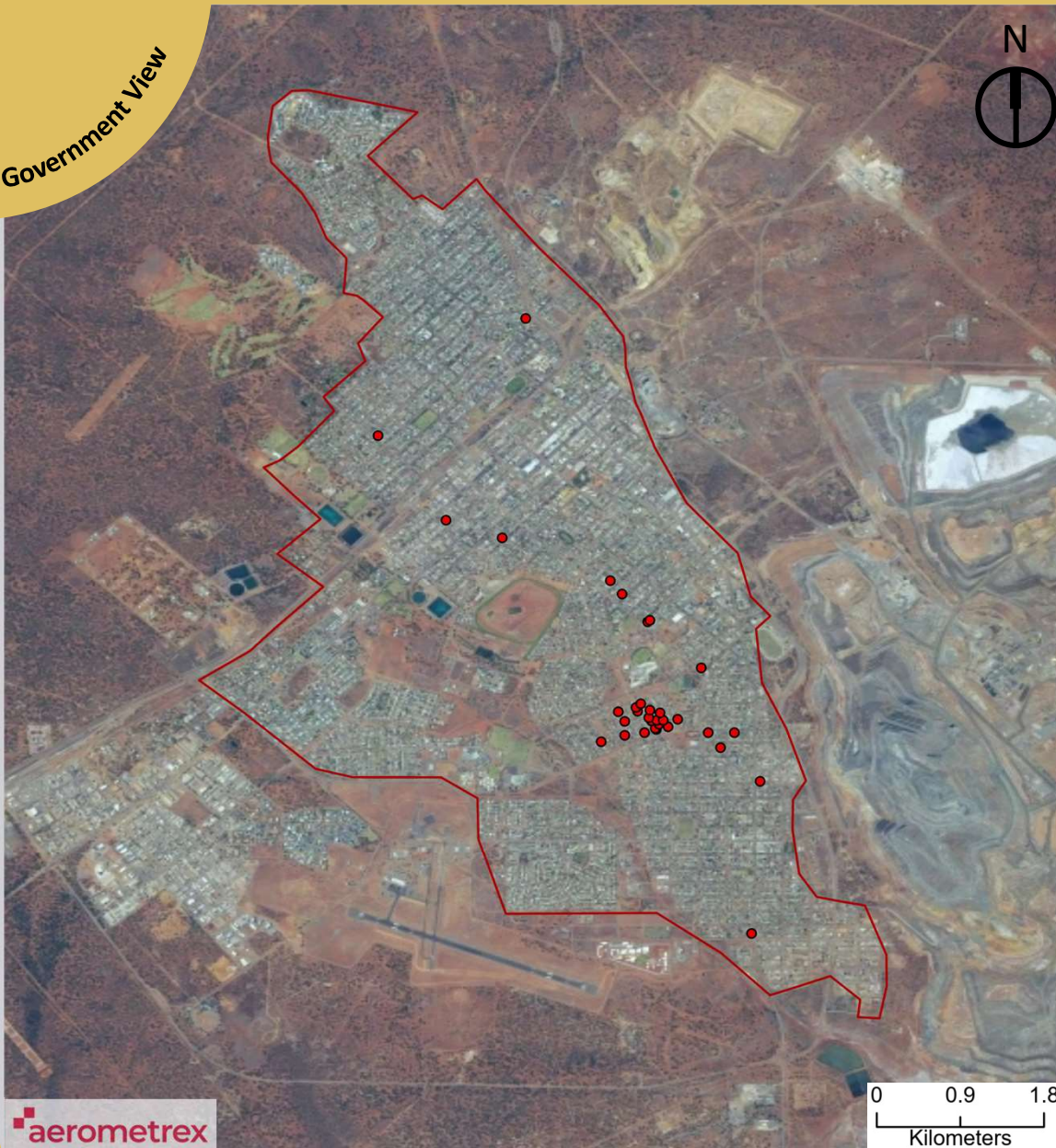
- Roofs with Asbestos Containing Material
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**Geraldton – 13.8km<sup>2</sup>**

The Geraldton area of interest is comprised of the 'Geraldton' SA2. This AOI covers an area of 13.7 square kilometres with a population of 11,815 in 2016, and projected decline of 1,470 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 28.7 degrees.

# Residential Asbestos Roof Hotspots

Local Government View



aerometrex



ACM roofing



33 / 12,915 dwellings

ACM area



3,729m<sup>2</sup>

ACM mass



58.1 t

Density



Absolute: 0.3%  
Relative to avg. roof size: 0.2%

Aerial imagery

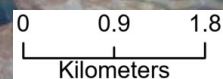


19/02/2020

Accuracy



100%



## Legend

- Roofs with Asbestos Containing Material
- Area of Interest Boundaries
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## Boulder – 23.4km<sup>2</sup>

The Boulder area of interest is comprised of the 'Boulder', 'Kalgoorlie' and 'Kalgoorlie – North' SA2s. This AOI covers an area of 23.4 square kilometres with a population of 29,861 in 2016, and projected growth of 830 persons between 2016 and 2031. The area is located in Climate Zone 4 (i.e. hot dry summer, cool winter) at a latitude of 30.7 degrees.

# Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



127 / 8,062 dwellings

ACM area



14,351m<sup>2</sup>

ACM mass



223.8 t

Density



Absolute: 1.6%  
Relative to avg. roof size: 1.5%

Aerial imagery

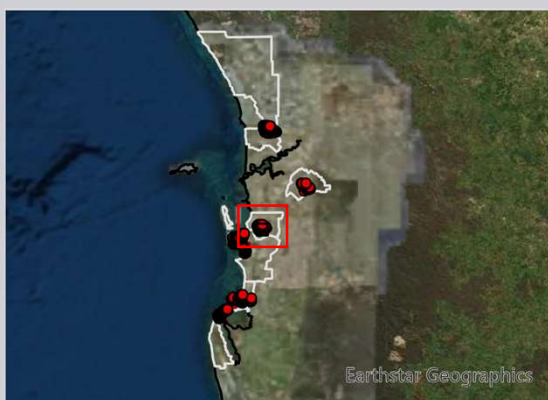


02/05/2020

Accuracy



100%



## Legend

- Roofs with Asbestos Containing Material
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## Calista – 11.5km<sup>2</sup>

The Calista area of interest is comprised of the 'Calista' and 'Parmelia – Orelia' SA2s. This AOI covers an area of 11.4 square kilometres with a population of 18,609 in 2016, and projected growth of 3,810 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 32.2 degrees.



# Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



373 / 14,088 dwellings

ACM area



42,149m<sup>2</sup>

ACM mass



657.5 t

Density



Absolute: 2.6%  
Relative to avg. roof size: 2.6%

Aerial imagery

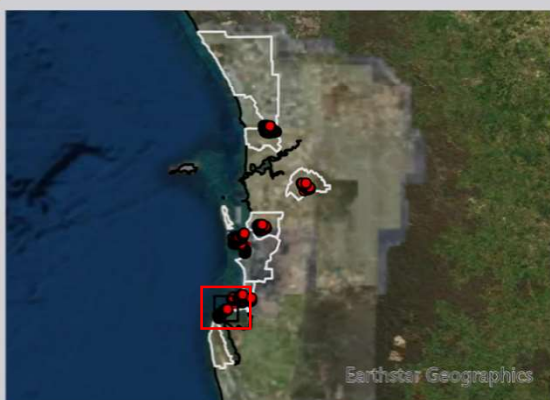


21/02/2020

Accuracy



100%



## Legend

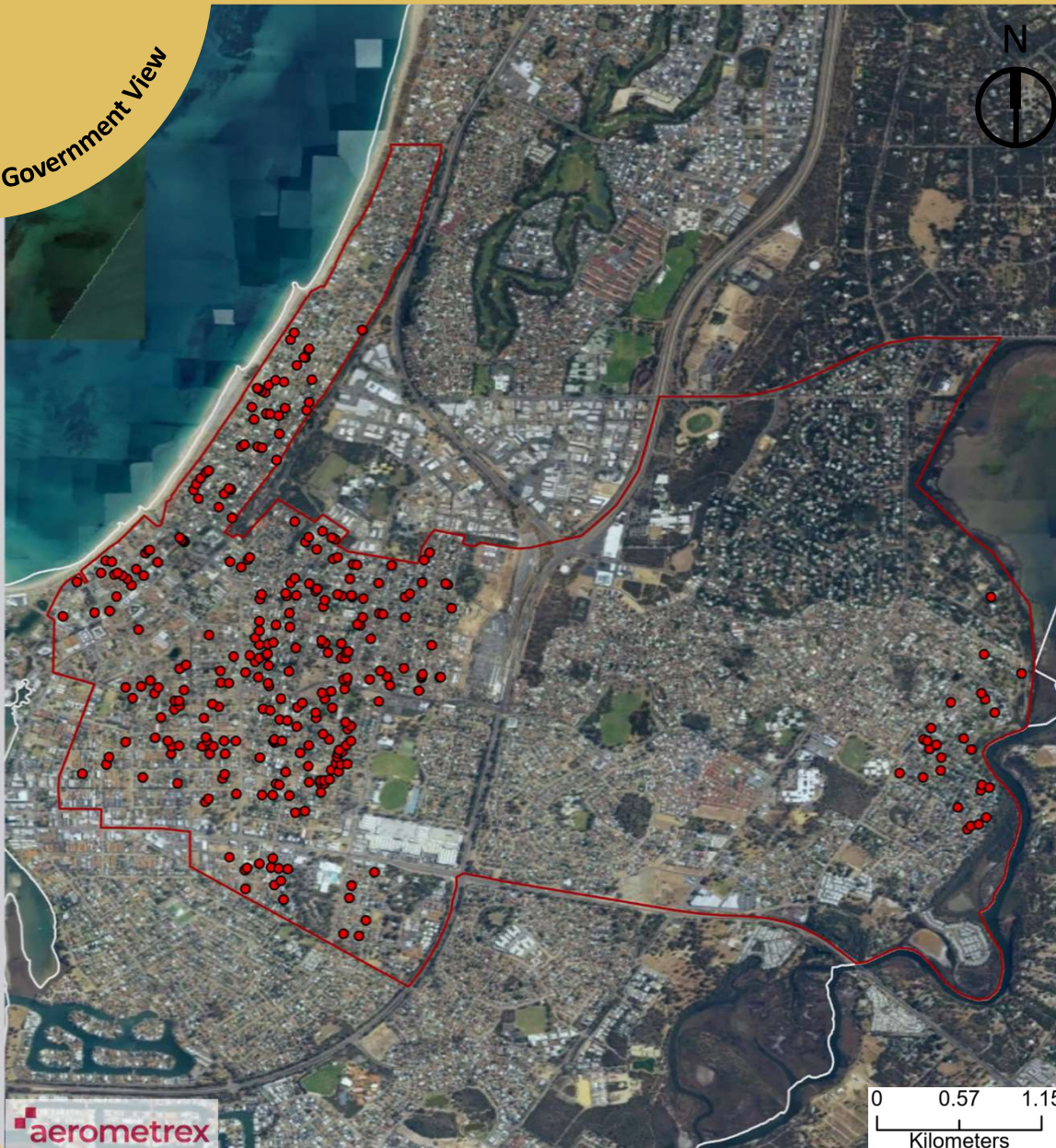
- Roofs with Asbestos Containing Material
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## Halls Heads – 21.6km<sup>2</sup>


The Halls Head area of interest is comprised of the 'Halls Head – Erskine' and 'Falcon – Wannanup' SA2s. This AOI covers an area of 21.5 square kilometres with a population of 27,329 in 2016, and projected growth of 1,118 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 32.5 degrees.


# Residential Asbestos Roof Hotspots


Local Government View





ACM roofing  
  
 306 / 8,718 dwellings

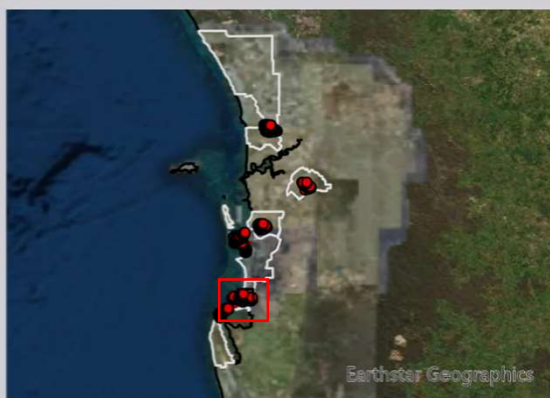
ACM area  
  
 34,578m<sup>2</sup>

ACM mass  
  
 539.4 t

Density  
  
 Absolute: 3.5%  
 Relative to avg. roof size: 3.4%

Aerial imagery  
  
 21/02/2020

Accuracy  
  
 100%



Legend

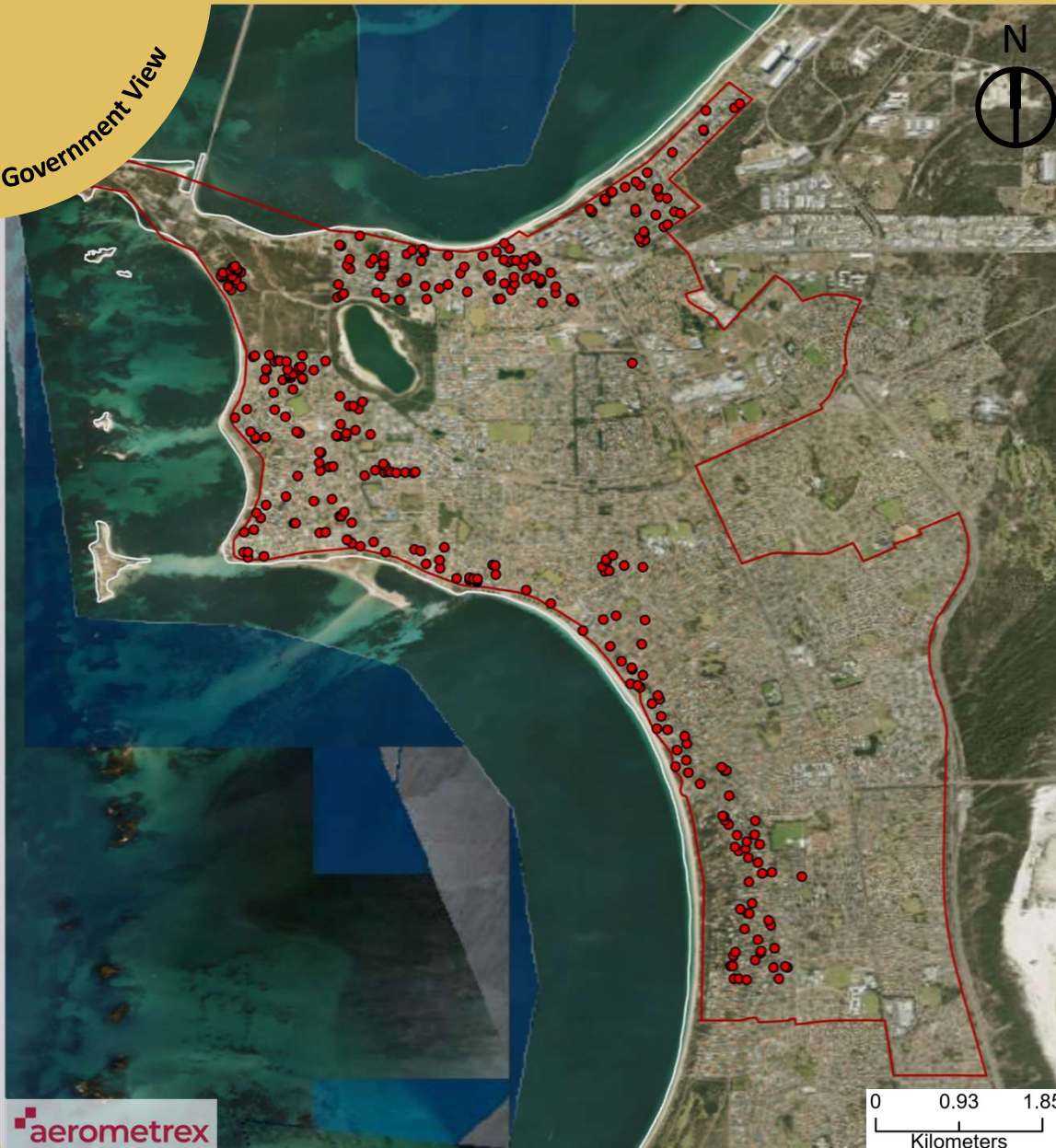
- Roofs with Asbestos Containing Material
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## Mandurah Greenfields – 15.1km<sup>2</sup>

The Mandurah Greenfields area of interest is comprised of the 'Mandurah' and 'Greenfields' SA2s. This AOI covers an area of 15 square kilometres with a population of 18,909 in 2016, and projected growth of 2,645 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 32.5 degrees.

# Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



315 / 23,208 dwellings

ACM area



35,595m<sup>2</sup>

ACM mass



555.2 t

Density



Absolute: 1.4%  
Relative to avg. roof size: 1.3%

Aerial imagery

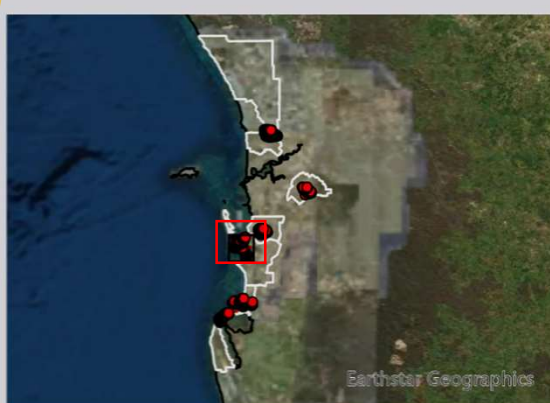


02/05/2020

Accuracy



100%



## Legend

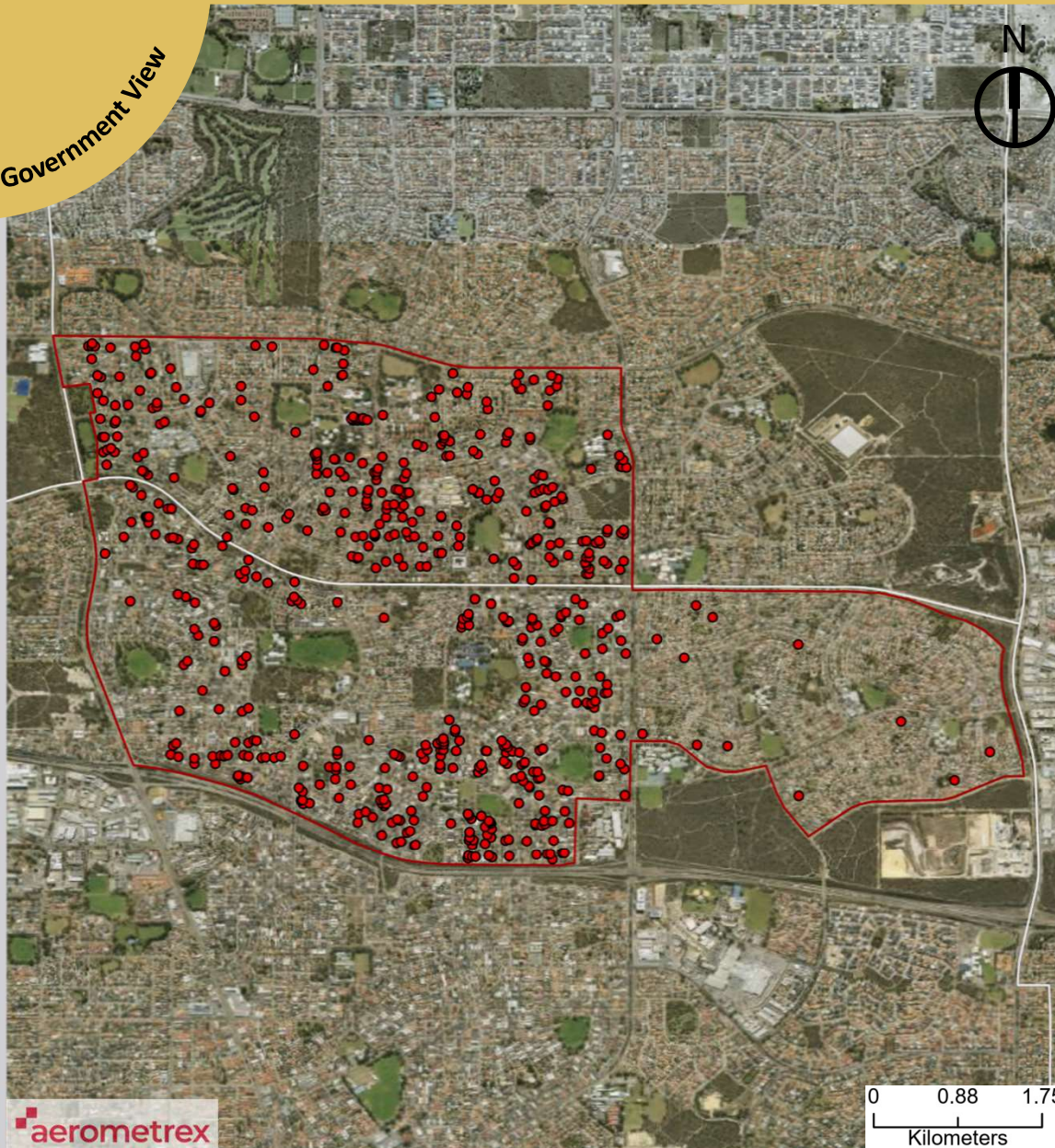
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## Rockingham South Perth – 30.9km<sup>2</sup>

The Rockingham South Perth area of interest is comprised of the 'Rockingham', 'Safety Bay – Shoalwater', 'Waikiki' and 'Warnbro' SA2s. This AOI covers an area of 30.9 square kilometres with a population of 50,112 in 2016, and projected decline of 3,275 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 32.2 degrees.

# Residential Asbestos Roof Hotspots

Local Government View



aerometrex

ACM roofing



584 / 11,623 dwellings

ACM area



65,992m<sup>2</sup>

ACM mass



1,029.4 t

Density



Absolute: 5.0%  
Relative to avg.  
roof size: 4.9%

Aerial imagery

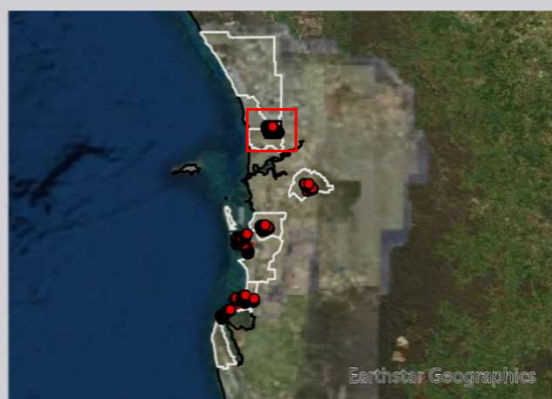


02/05/2020

Accuracy



100%



## Legend

- Roofs with Asbestos Containing Material
- Area of Interest Boundaries
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- State & Territory Boundaries

## Balga North Perth – 12.4km<sup>2</sup>

The Balga North Perth area of interest is comprised of the 'Balga – Mirrabooka' and 'Girrawheen' SA2s. This AOI covers an area of 12.4 square kilometres with a population of 28,728 in 2016, and projected growth of 2,290 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 31.8 degrees.