



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.



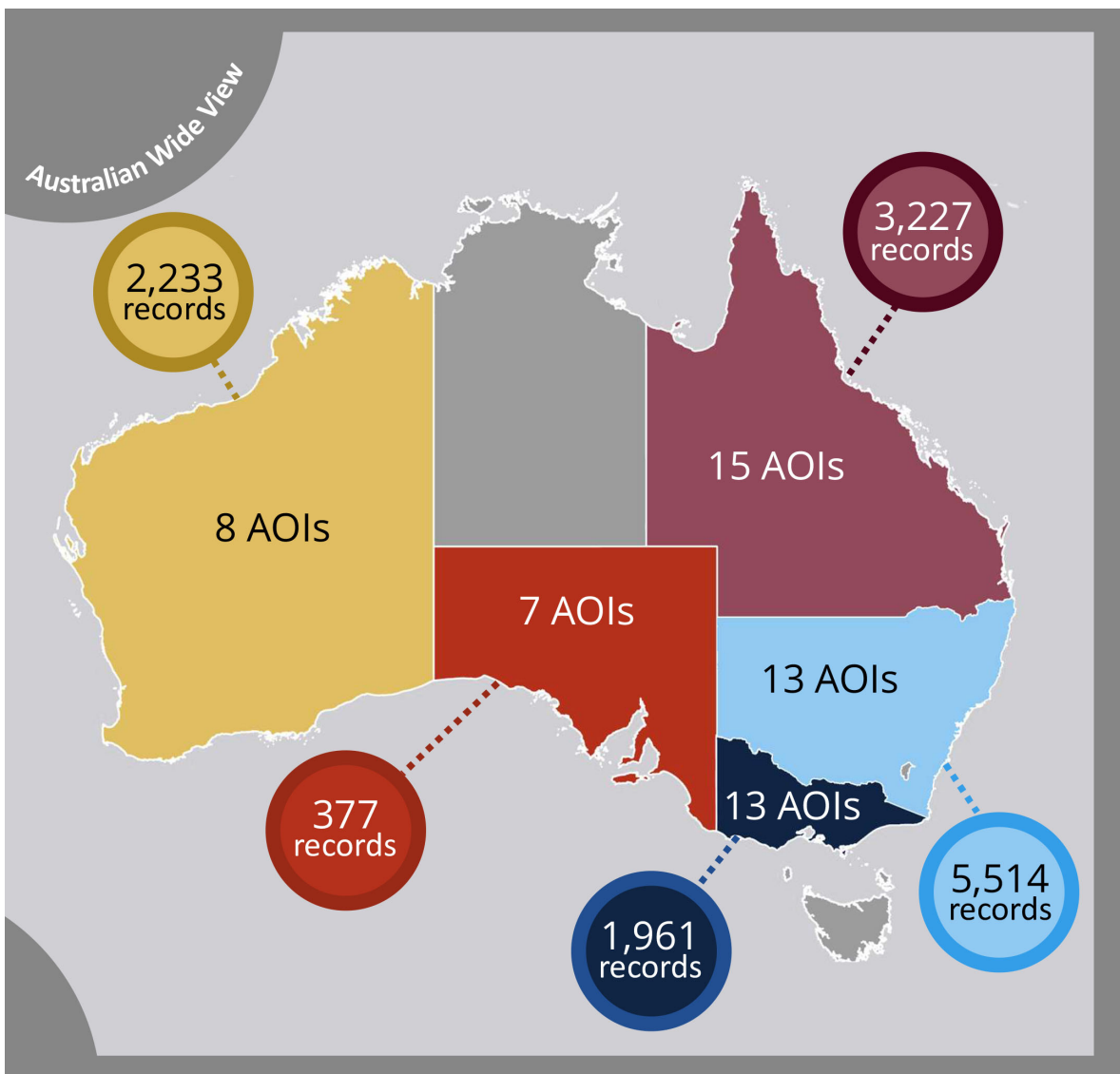
Asbestos National Strategic Plan

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.





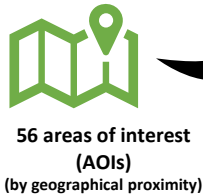
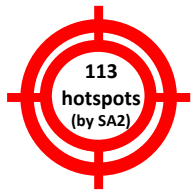
Asbestos cement roof hotspots – summary

RESULTS

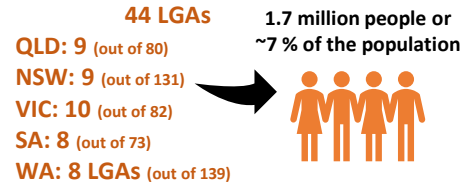
asbestos cement roof count = 13 312
estimated waste volume = 23 105 t
estimated waste area = 1 481 190 m²
estimated waste in football fields = ~207



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 ²	84 m ²	126 m ²	143 m ²	113 m ²
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 ² (~65)	463 176 m ² (~65)	247 086 m ² (~35)	53 911 m ² (~7.5)	252 329 m ² (~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 km² of each SA2, covering a total of ~15 km² 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



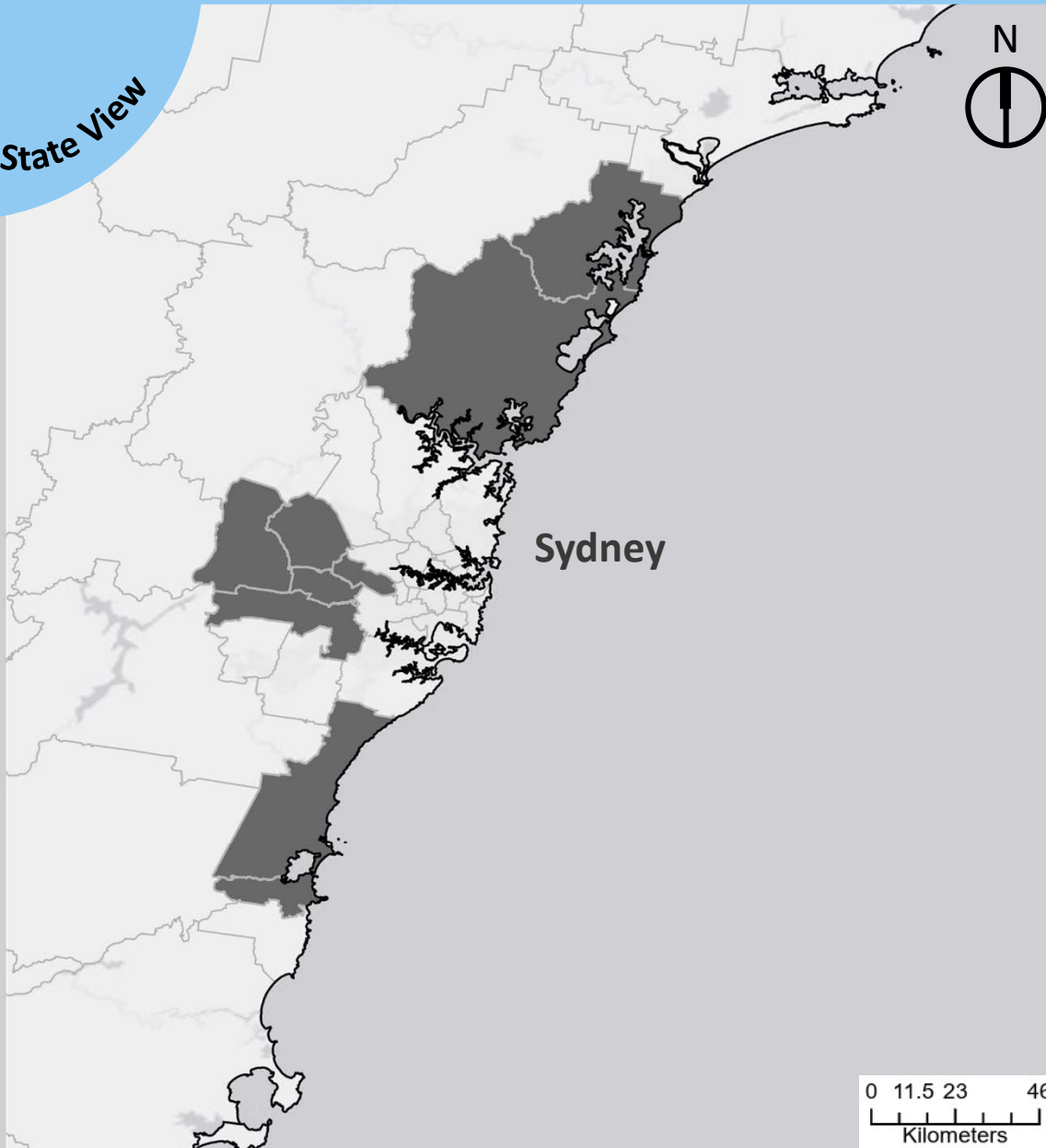
ESTIMATED DENSITY

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

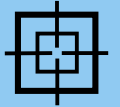
3 : 1 : 6

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:
9 LGAs



5,514
Total
Buildings

Accuracy



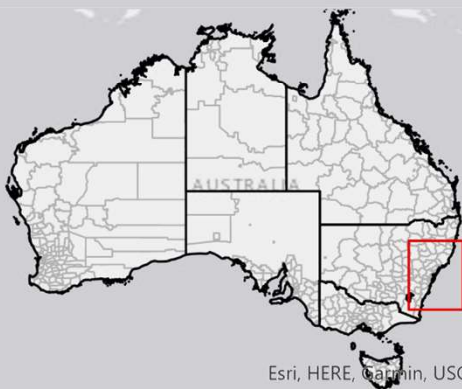
98%



13 Areas of
Interest



188km²
Hotspot
area



Esri, HERE, Garmin, USGS

Legend

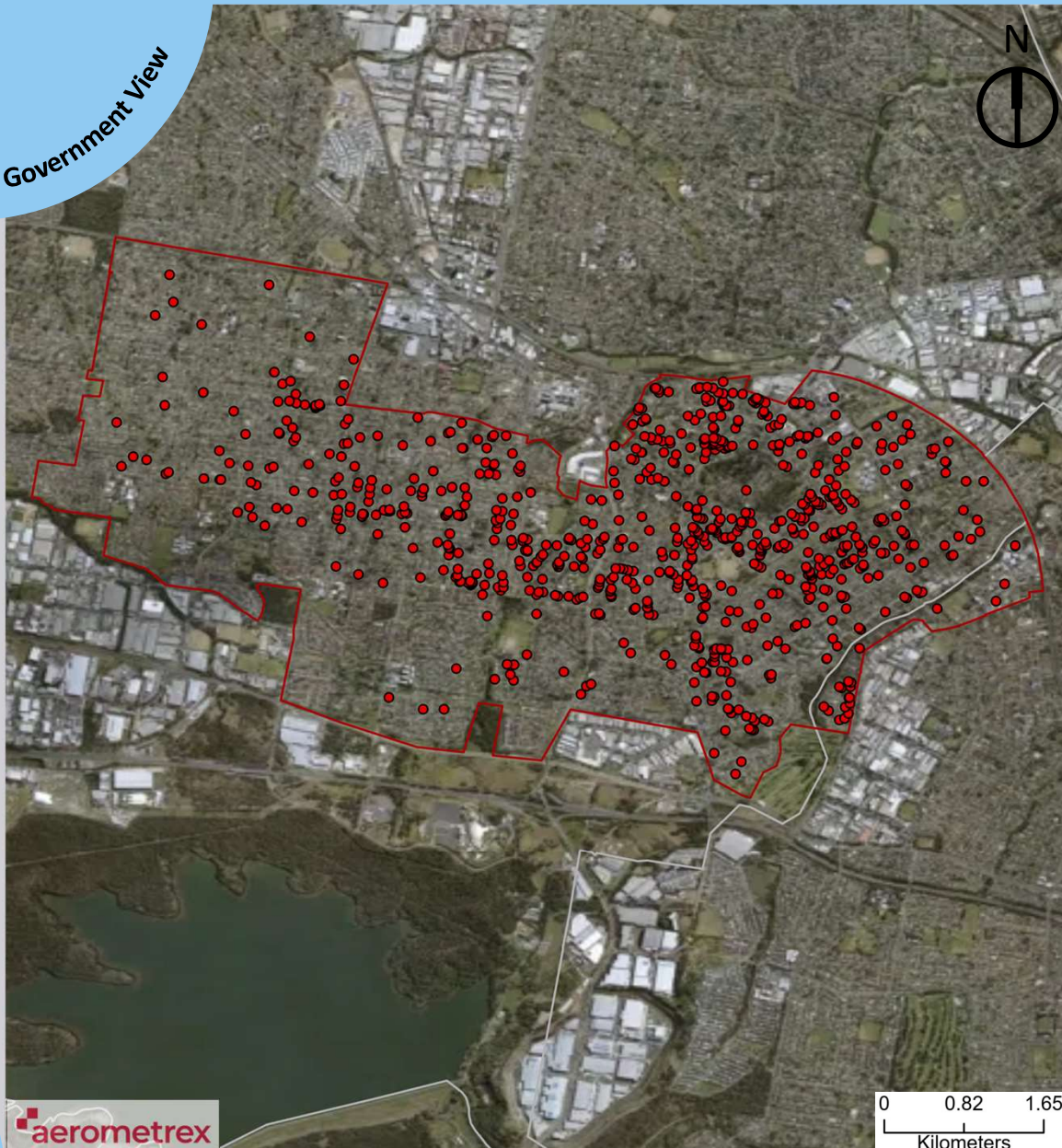
- Local Government Areas with Asbestos Hotspots (NSW)
- Local Government Areas
- State & Territory Boundaries

New South Wales

New South Wales asbestos roofing hotspots were identified in the Blacktown, Central Coast, Fairfield, Lake Macquarie, Liverpool, Penrith, Shellharbour and Wollongong local government areas. The New South Wales area of interests are distributed across 41 SA2s with a population of 625,457 persons in 2016. In total, 463,176 square metres of asbestos roofing were found in the state, which equates to 7,225 tonnes of ACM.

Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



783 buildings /
17,964 dwellings

ACM area



65,772m²

ACM mass



1,026 t

Density



Absolute: 4.4%
Relative to avg.
roof size: 3.2%

Aerial imagery

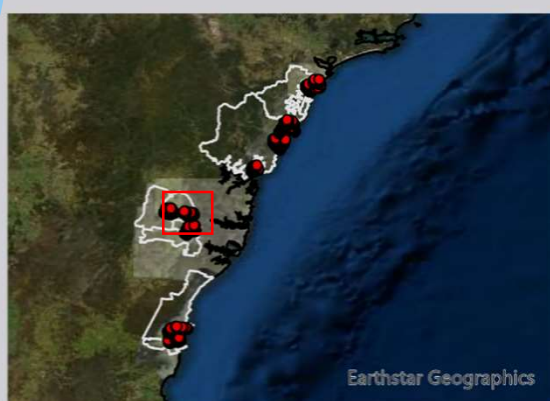


29/08/2020

Accuracy



100%



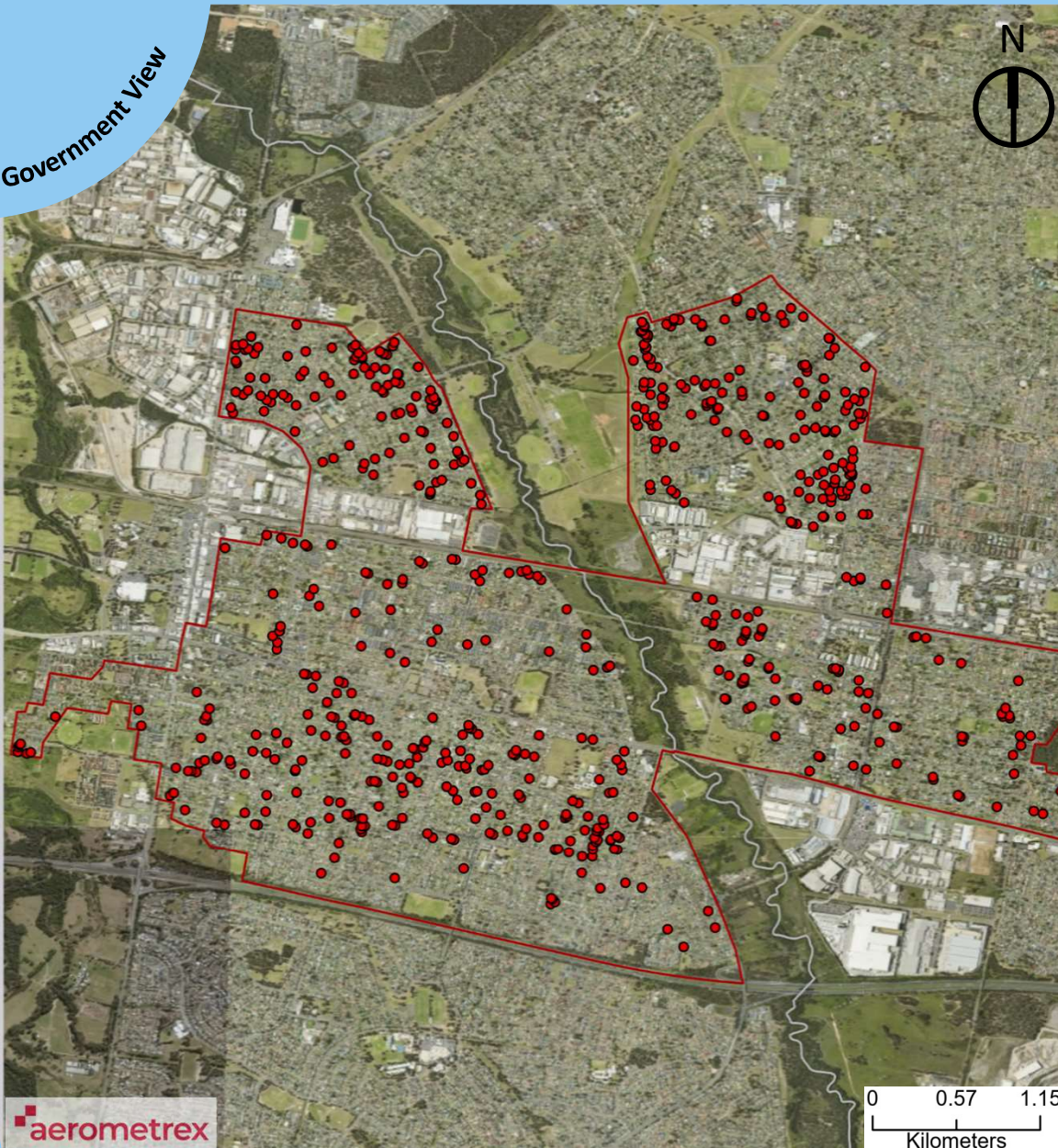
Legend

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

Blacktown – 16.6km²

The Blacktown area of interest is comprised of the 'Blacktown (South)', 'Blacktown (West)' and 'Seven Hills – Toongabbie' SA2s. This AOI covers an area of 16.5 square kilometres with a population of 52,334 in 2016, and projected growth of 26,652 persons between 2016 and 2031. The area is located in Climate Zone 6 (i.e. mild temperate) at a latitude of 33.7 degrees.

Local Government View



ACM roofing



632 buildings / 18,428 dwellings

ACM area



53,088m²

ACM mass



828.1 t

Density



Absolute: 3.4%
Relative to avg. roof size: 2.5%

Aerial imagery

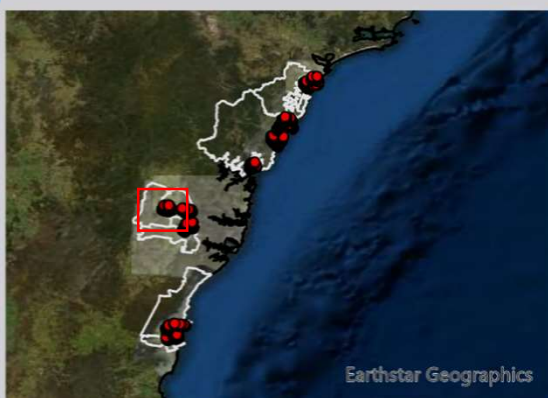


10/12/2020

Accuracy



100%



Legend

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

Sydney's Outer Suburbs – 15.1km²

The Sydney Outer Suburbs area of interest is comprised of the 'Mount Druitt – Whalan', 'Colyton – Oxley Park' and 'St Marys – North St Marys' SA2s. This AOI covers an area of 15 square kilometres with a population of 50,380 in 2016, and projected growth of 18,946 persons between 2016 and 2031. The area is located in Climate Zone 6 (i.e. mild temperate) at a latitude of 33.7 degrees.

Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



200 / 8,567 dwellings

ACM area



16,800m²

ACM mass



262 t

Density



Absolute: 2.3%
Relative to avg. roof size: 1.7%

Aerial imagery

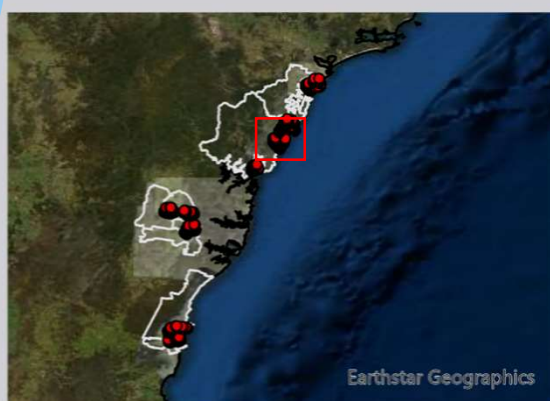


06/04/2020

Accuracy



100%



Legend

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

Budgewoi – 6.8km²

The Budgewoi area of interest is comprised of the 'Budgewoi – Buff Point – Halekulani' and 'Blue Haven – San Remo' SA2s. This AOI covers an area of 6.7 square kilometres with a population of 20,372 in 2016, and projected growth of 7,133 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 33.2 degrees.

Local Government View



ACM roofing



221 / 9,438 dwellings

ACM area



18,564m²

ACM mass



289.5 t

Density



Absolute: 2.3%
Relative to avg.
roof size: 1.7%

Aerial imagery

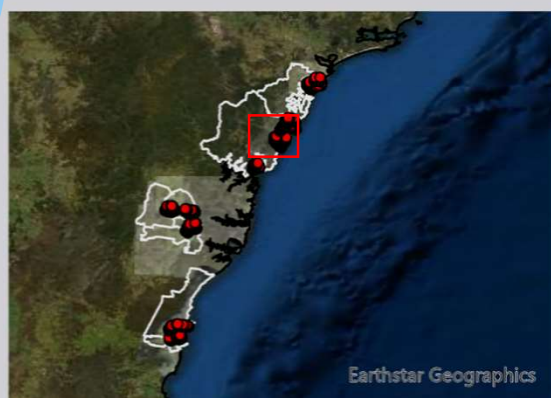


06/04/2020

Accuracy



96%



Legend

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

Gorokan – 8.5km²

The Gorokan area of interest is comprised of the 'Gorokan – Kanwal – Charmhaven' SA2. This AOI covers an area of 8.4 square kilometres with a population of 22,094 in 2016, and projected growth of 3,988 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 33.2 degrees.

Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



370 / 18,702 dwellings

ACM area



31,080m²

ACM mass



167.7 t

Density



Absolute: 2.0%
Relative to avg. roof size: 1.4%

Aerial imagery

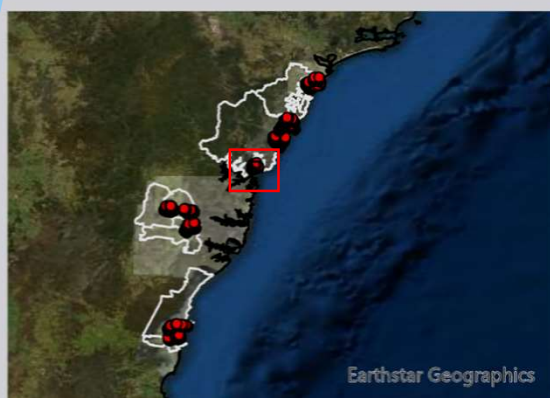


06/04/2020

Accuracy



88%



Legend

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

Gosford – 15.5km²

The Gosford area of interest is comprised of the 'Umina – Booker Bay – Patonga' and 'Woy Woy – Blackwall' SA2s. This AOI covers an area of 15.5 square kilometres with a population of 37,568 in 2016, and projected growth of 6,781 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 33.5 degrees.

Local Government View



ACM roofing



373 / 24,221 dwellings

ACM area



31,332m²

ACM mass



488.7 t

Density



Absolute: 1.5%
Relative to avg. roof size: 1.1%

Aerial imagery

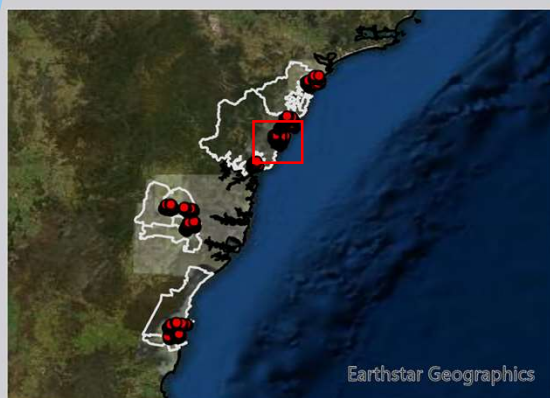


06/04/2020

Accuracy



100%



Legend

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

The Entrance – 17.9km²

The Entrance area of interest is comprised of the 'The Entrance', 'Chittaway Bay – Tumby Umbi' and 'Bateau Bay – Killarney Vale' SA2s. This AOI covers an area of 17.8 square kilometres with a population of 52,284 in 2016, and projected growth of 8,763 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 33.3 degrees.

Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



143 / 4,713 dwellings

ACM area



12,012m²

ACM mass



1,873 t

Density



Absolute: 3.0%
Relative to avg. roof size: 2.2%

Aerial imagery

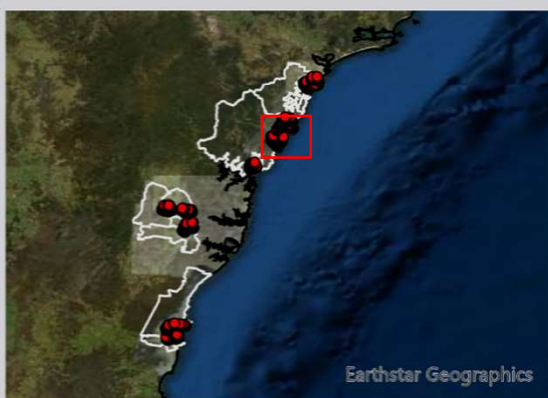


06/04/2020

Accuracy



99%



Legend

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

Toukley Norah Head – 4.7km²

The Toukley Norah Head area of interest is comprised of the 'Toukley – Norah Head' SA2. This AOI covers an area of 4.7 square kilometres with a population of 9,772 in 2016, and projected growth of 1,764 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 33.2 degrees.

Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



1,938 buildings /
23,883 dwellings

ACM area



162,792m²

ACM mass



2,539.5 t

Density



Absolute: 8.1%
Relative to avg.
roof size: 5.9%

Aerial imagery

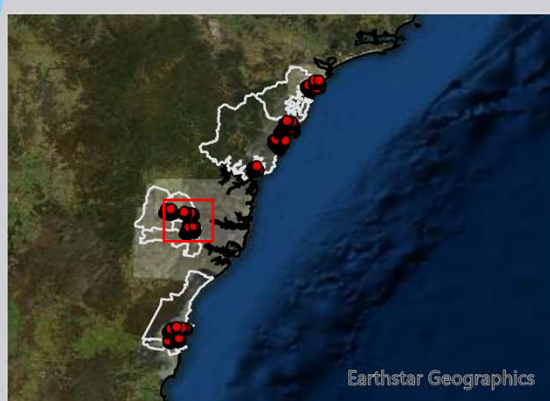


01/12/2020

Accuracy



94%



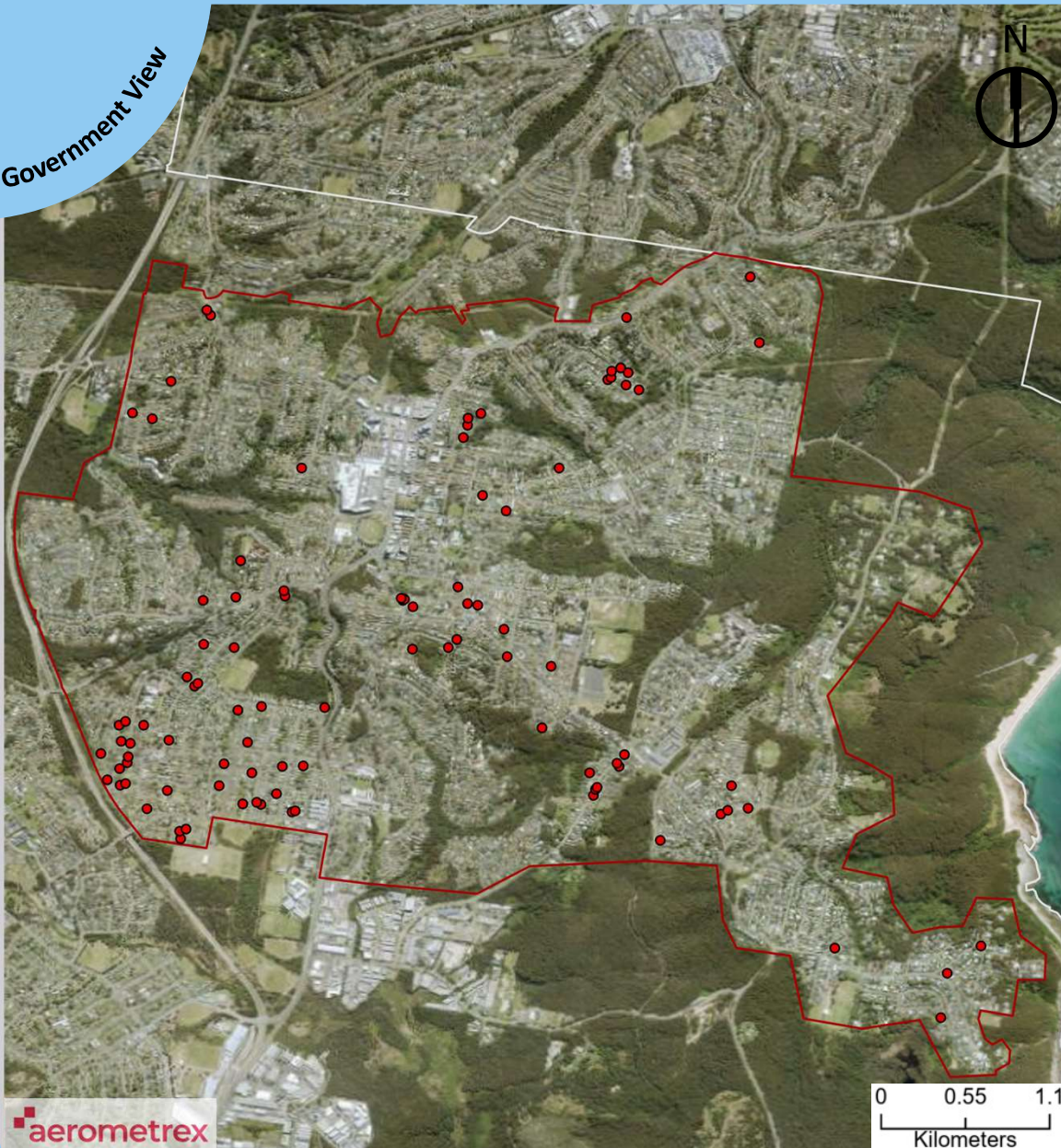
Legend

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

West Sydney – 35.3km²

The West Sydney area of interest is comprised of the 'Cabramatta West – Mount Pritchard', 'Canley Vale – Canley Heights', 'Fairfield', 'Fairfield – West', 'Greenfield Park – Prairiewood' and 'St Johns Park – Wakele' SA2s. The SA2s are distributed across the Fairfield and Liverpool local government areas. This AOI covers an area of 35.3 square kilometres with a population of 239,167 in 2016 including adjacent SA2s partially covered by the aerial image extract (e.g., 'Liverpool', 'Cabramatta – Lansvale', etc.). The AOI is projected to grow by 54,160 persons between 2016 and 2031. It is located in Climate Zone 6 at a latitude of 33.8 degrees.

Local Government View



ACM roofing



96 / 10,114 dwellings

ACM area



8,064m²

ACM mass



125.7 t

Density



Absolute: 0.9%
Relative to avg.
roof size: 0.7%

Aerial imagery

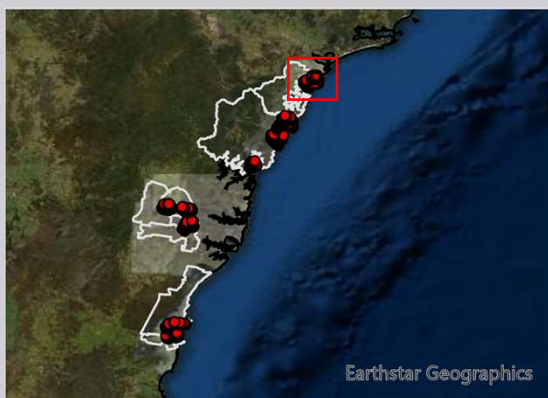


03/09/2020

Accuracy



100%



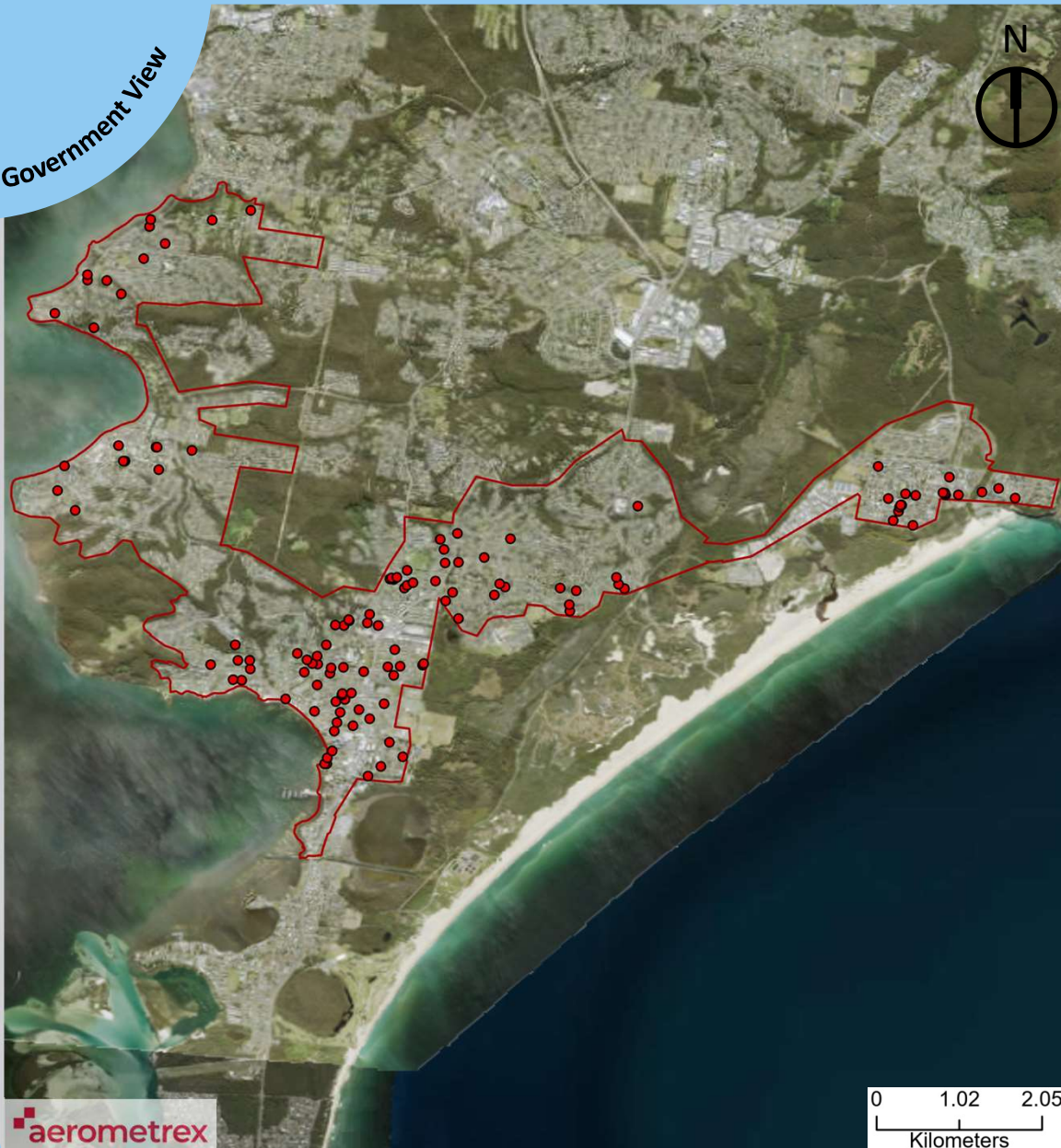
Legend

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

Lake Macquarie – 14.2km²

The Lake Macquarie area of interest is comprised of the 'Charlestown – Dudley' SA2. This AOI covers an area of 14.2 square kilometres with a population of 27,452 in 2016, and projected growth of 2,200 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 32.9 degrees.

Local Government View



ACM roofing



126 / 21,607 dwellings

ACM area



10,584m²

ACM mass



165.1 t

Density



Absolute: 0.6%
Relative to avg.
roof size: 0.7%

Aerial imagery

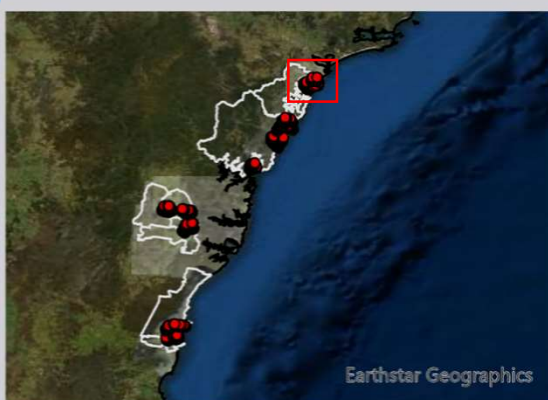


03/09/2020

Accuracy



100%



Legend

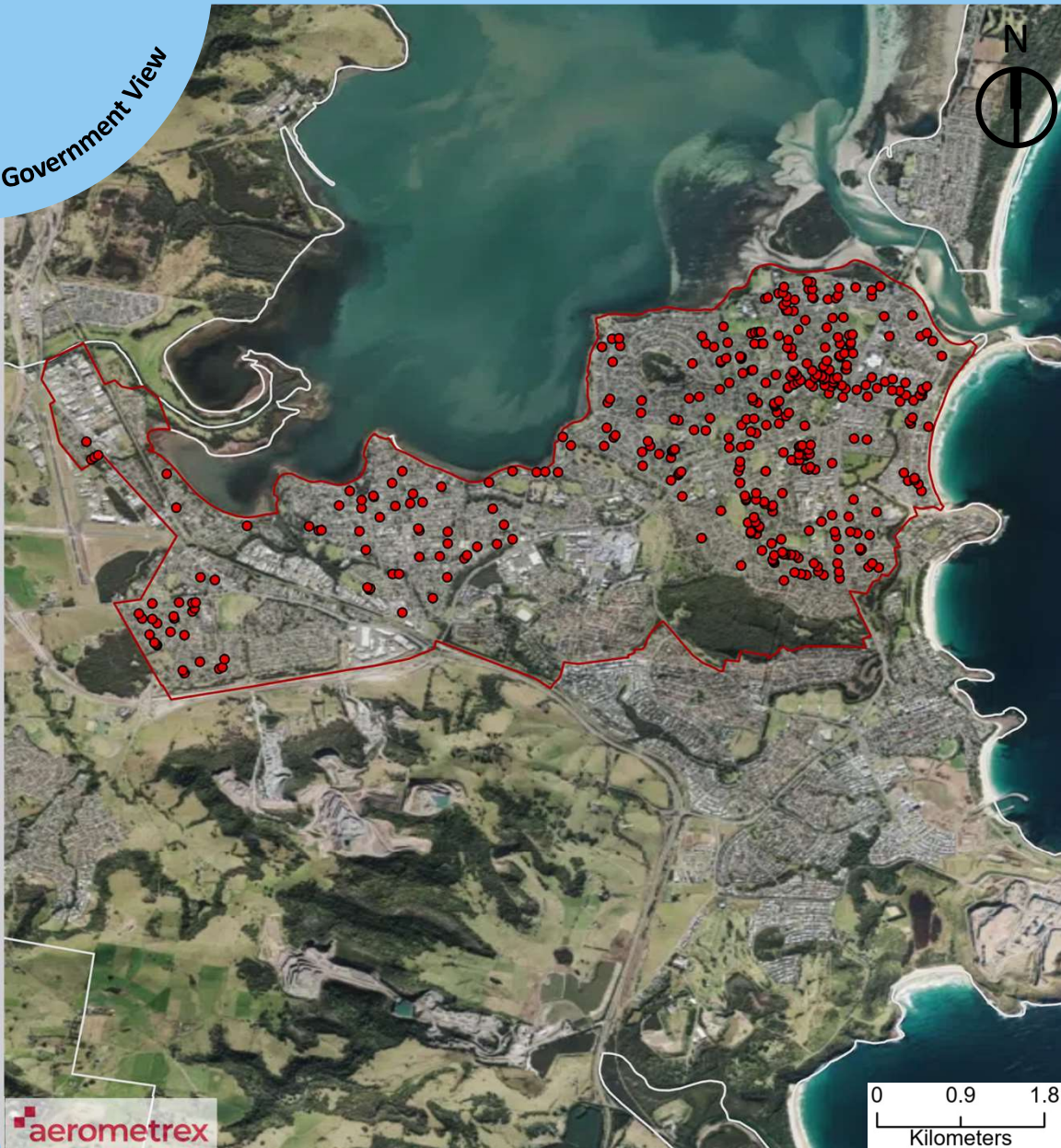
- Roofs with Asbestos Containing Material
- Area of Interest Boundaries
- Local Government Areas with Asbestos Hotspots (NSW)
- State & Territory Boundaries

Redhead – 14.3km²

The Redhead area of interest is comprised of the 'Redhead', 'Valentine – Eleebana' and 'Belmont – Bennetts Green' SA2s. This AOI covers an area of 14.3 square kilometres with a population of 29,719 in 2016, and projected growth of 3,050 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 33 degrees.

Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



373 / 15,286 dwellings

ACM area



31,332m²

ACM mass



488.7 t

Density



Absolute: 2.4%
Relative to avg. roof size: 1.8%

Aerial imagery

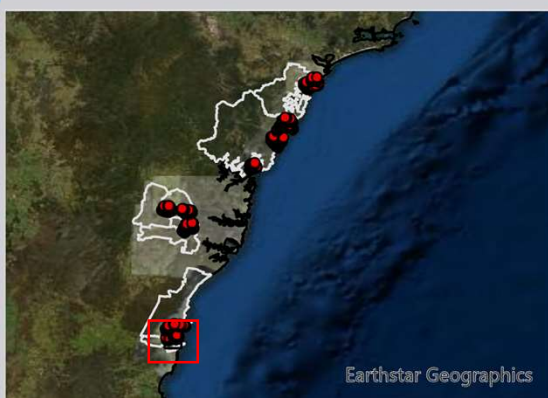


05/07/2020

Accuracy



100%



Legend

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

Shellharbour – 20.3km²

The Shellharbour area of interest is comprised of the 'Shellharbour – Oak Flats', 'Albion Park Rail' and 'Warilla' SA2s. This AOI covers an area of 20.3 square kilometres with a population of 37,268 in 2016, and projected growth of 8,423 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 34.5 degrees.

Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



128 / 9,395 dwellings

ACM area



10,752m²

ACM mass



167.7 t

Density



Absolute: 1.4%
Relative to avg. roof size: 1.0%

Aerial imagery

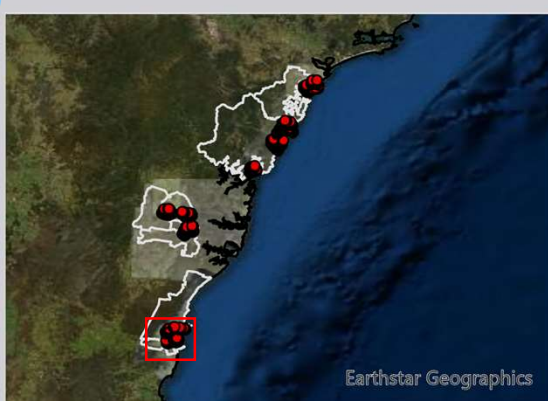


05/07/2020

Accuracy



100%



Legend

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

Dapto Avondale – 8.1km²

The Dapto Avondale area of interest is comprised of the 'Dapto – Avondale' SA2. This AOI covers an area of 8.1 square kilometres with a population of 23,476 in 2016, and projected growth of 3,179 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 34.5 degrees.

Residential Asbestos Roof Hotspots

Local Government View



ACM roofing



131 / 9,835 dwellings

ACM area



11,004m²

ACM mass



171.6 t

Density



Absolute: 1.3%
Relative to avg. roof size: 1.0%

Aerial imagery

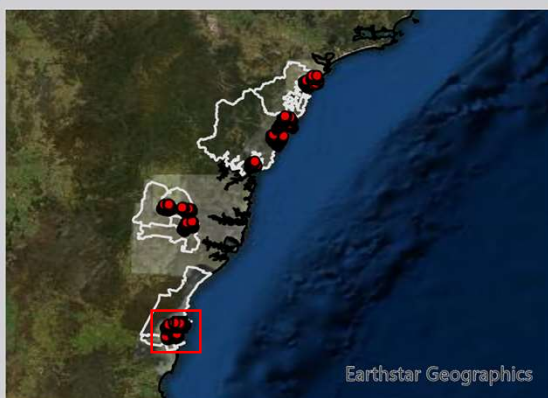


05/07/2020

Accuracy



100%



Legend

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

Port Kembla – 9.1km²

The Port Kembla area of interest is comprised of the 'Port Kembla – Warrawong' and 'Berkeley – Lake Heights – Cringila' SA2s. This AOI covers an area of 9.1 square kilometres with a population of 23,571 in 2016, and projected growth of 9,270 persons between 2016 and 2031. The area is located in Climate Zone 5 (i.e. warm temperate) at a latitude of 34.4 degrees.