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ASBESTOS: the next national plan

Proactivity, prevention, planning

Workshop 6

Ageing asbestos and infrastructure

#2018ASEACONF

Australian Government
Asbestos Safety and Eradication Agency

NSW

Thuroona Services

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Welcome

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Management of aging asbestos cement roofs and other structures

Pierina Otness – Senior Toxicologist,
Public and Aboriginal Health Division,
Department of Health, WA

Introduction

- Future focus for asbestos management
- WA approach for managing aging asbestos infrastructure into the future – starting with AC roofs
- Justification for WA position
- Issues and obstacles
- Future Challenges

The future of asbestos management

- Global "megatrends" impacting asbestos management (CSIRO)
  - Globalisation and fragmented supply chains (importation)
  - Climate change –severe storms / fire events
  - Governments incentivising recycling and increasing landfill levies to minimise waste - recycling stream;
  - DIY renovators and the younger workforce – identification and understanding of asbestos risks;
  - Ageing infrastructure
    - Urbanisation and infill development –demolition of asbestos-containing materials.

The future of asbestos management

- The project identified scenarios that could result from these changes.
  - asbestos exposure risk being dangerously disregarded in the future
  - greater awareness and demand for asbestos removal - workforce struggling to keep up with that demand
  - shortcomings in the understanding of tools and technologies for managing asbestos.
  - Better understanding through "digital tools, aids and technologies to the best effect“.
- Avoiding the more negative outcomes will require data enabling exposure risk to be effectively assessed and managed.
- Innovations in asbestos-related technology need to be tracked, while the balance between the demand for asbestos-related work and the supply of workers must be monitored.

Effective Management to prevent exposure

- WHS legislation assists ongoing provisions and systems of work for workplaces. Prevention of uncontrolled exposures to asbestos in non-occupational settings is more complex, especially for younger adult generation.
- Uncertainty for risk assessment at low levels of exposure
- Uncertainty does not need to be a barrier to good occupational and environmental health policy.

Management to prevent exposure

- Aim is to prevent exposure to airborne asbestos fibres.
- Good management leads to rating of condition of material
  - “Condition ratings” vs “risk ratings”

Contamination from AC roofs and other materials

- Asbestos contamination may arise from potential non-compliances with existing legislation and control measures or legacy sites
  - Demolition, removal and dumping activity
  - Inadequate or incomplete clean-up following asbestos removal/demolition work
  - High pressure water
  - Illegal dumping
  - Historical land use/fill or uncontrolled fill
- Incidents
  - Fire and natural disasters

High pressure cleaning

- Information available for managing illegal high pressure cleaning of asbestos roofs

Asbestos Cement Roofs - past advice for management

- Maintaining awareness and control
  - Cleaning and Coating vs painting
    - How many people follow advice:
      - Fungicide/algaecide treatment
      - Manual wet cleaning and collection of waste
      - Professional coating.
  - Who are the professionals?
  - Repairing vs encapsulation vs removal
  - Roof plumbing arrangements
  - Roof plant and equipment
  - Inspect asbestos cement roofs regularly for signs of deterioration and damage.

Cost and Impacts – Making good decisions

- Most asbestos cement roofs are over 40 years old and may have reached the end of their useful life
  - Adequate cleaning difficult, especially if no regular maintenance.
  - Better to remove and replace an asbestos cement while it is still in a relatively stable condition. The level of control and associated costs of removal may be higher for roofs in poor condition.
  - Asbestos cement roofs become brittle with age.
  - Impacts to surrounding soil from contamination require additional cleaning and validation testing.

Preferred approach to management

- Role of EHO
  - Education and negotiation
  - Risk Assessment and provide direction or professional advice on remediation and management
  - Enforcement
  - Reporting
- The assessment and management process requires the interpretation and application of the existing legislation
  - Occupational safety and health,
  - Public health
  - Environmental legislation
  - Codes of practice and guidelines and the associated reporting requirements

Health (Asbestos) Regulations 1992

- A person who stores, breaks, damages, cuts, maintains, repairs, removes, moves, or disposes of, or uses any material containing asbestos without taking reasonable measures to prevent asbestos fibres entering the atmosphere commits an offence.
- Reasonable Measures:
  - using water or other practical measures to keep airborne material containing asbestos to a minimum
  - non-powered hand tools
  - using approved vacuum cleaner or wet methods
  - no high pressure water or compressed air
  - ensuring, so far as is reasonably practicable, that material containing asbestos is not broken or abraded
  - disposed in accordance with Environmental Regs, as soon as practicable.

Observed response from since update to HAR

- Updates allow for infringements
  - Allows for early response and action
  - Witten notice served to:
    - the owner of the material or premises
    - a person handling material containing asbestos
  - Can direct that person to maintain, repair, remove, move, dispose of, or handle the material containing asbestos in such manner and within such time as is specified in the direction

Reality – some examples

- Environmental Health Professionals are often required to respond to a number of complaints
- They play an important role in responding to complaints, undertaking initial risk assessment and advising on appropriate actions
- Examples
  - I want to get rid of my fence but my neighbour doesn't
  - I have a professional heath risk assessment report saying my roof is ok
  - Tenants in Common and planning concerns
  - Ownership of the property / contamination

Future challenges

- Waste Management
  - Dynamic area
  - Increasing obstacles associated with residential removal and disposal
- Education and communication
- Other obstacles
- Remediation and Management has two main objectives
  - Prevent (accidental) release of respirable airborne fibres
  - Deal with community expectations associated with asbestos contamination

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Aging Asbestos Infrastructure – A Water Industry Perspective

Greg Ryan
Manager Utility Excellence

Historical Context

From 2012 to 2016 the Australian water industry undertook studies to:

- Inventory the current stock of AC water pipe and management practices
- Determine international good practices for management and disposal of buried AC pipe

Separately, the water industry has been working with ASEA on the development of training materials for the management of AC pipe (2014-16)

Supporting work with ASEA

Training

- Concerns with utility sector training and competency
- Strengthened asbestos training material
- Developed best practice training material for utility workers across Australia (2017)
  - Need to go beyond basic ‘awareness’
  - PPE including Respiratory Protective Equipment
  - Asbestos removal Control Plans
  - E-Learning and Skills Assessment (competency)

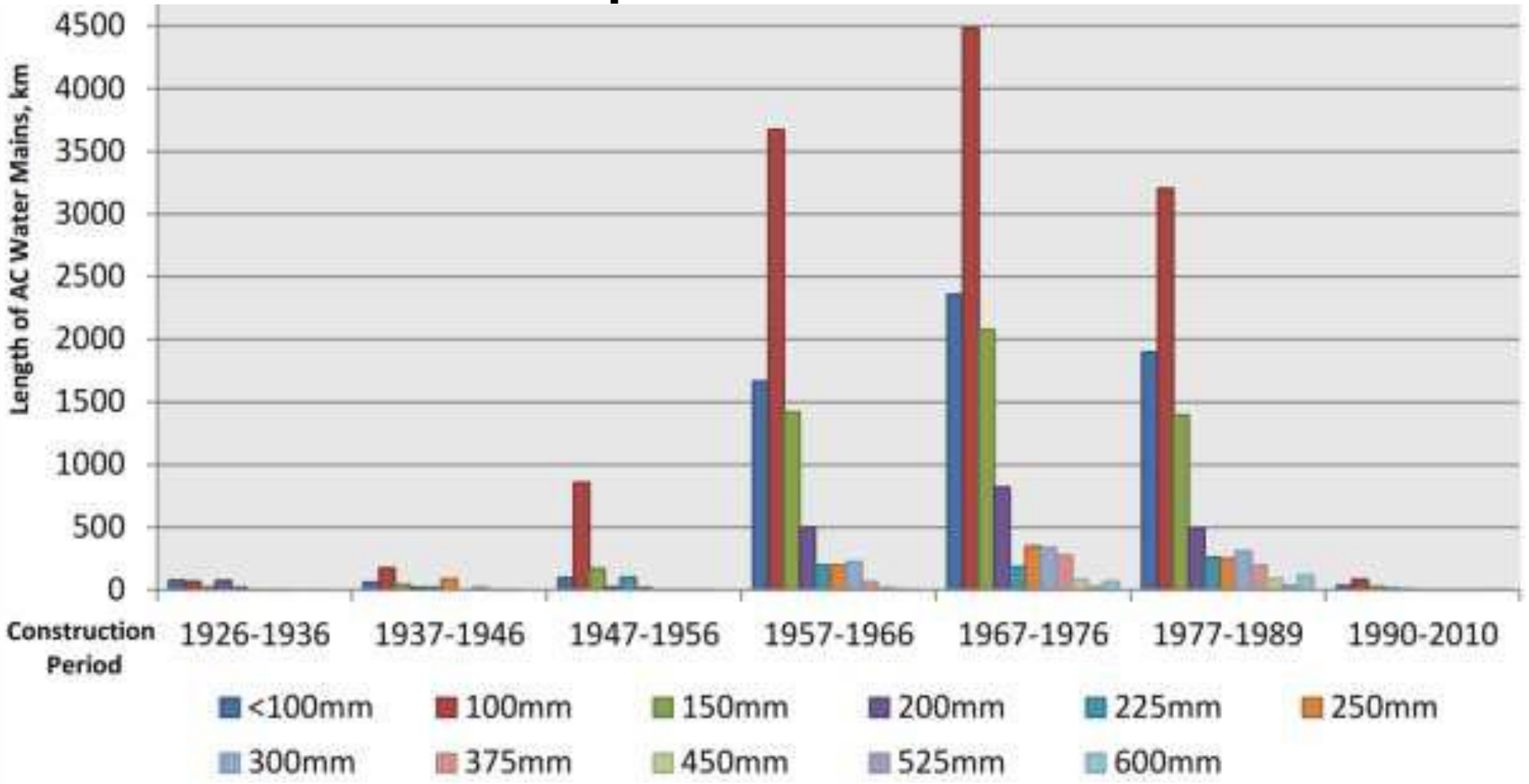
Publication of AC water pipes case studies report

WSAA AC Pipe Studies

- Stage 1 - 17 water agencies
  - 74% of Aust Water industry - based on size of utility
- Over 40,000 km's AC water mains still operating

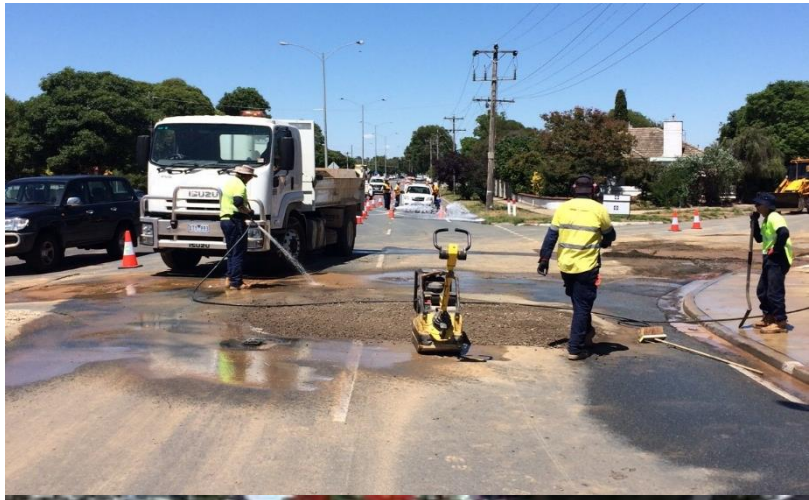
  (26% of water supply network by distance)
  - 765 km of pressure sewer rising mains
  - 3400 km of gravity sewer mains
- AC Pipe - highest failure rate of all pipe material
  - Biggest cohort 150mm diameter
- Highest proportion and oldest pipes in Victoria (70%)

Timeline of AC Pipe installation in Australia



Features of buried AC water pipes - Location

- Constructed predominantly within road reserves at depths from 450mm to 1.2m
- There is a minimum clearance of 150mm between the outside of water pipes and other services
- Independent US and Australian research shows no evidence of AC fibres migrating away and up from the immediate surrounding soil from broken pipes to the surface.
- To date AC water and sewer pipes have not been seen to produce friable asbestos



Recording and handling procedures

- Water agencies have standard operating procedures for handling and disposing of AC pipe
  - Regarded highly

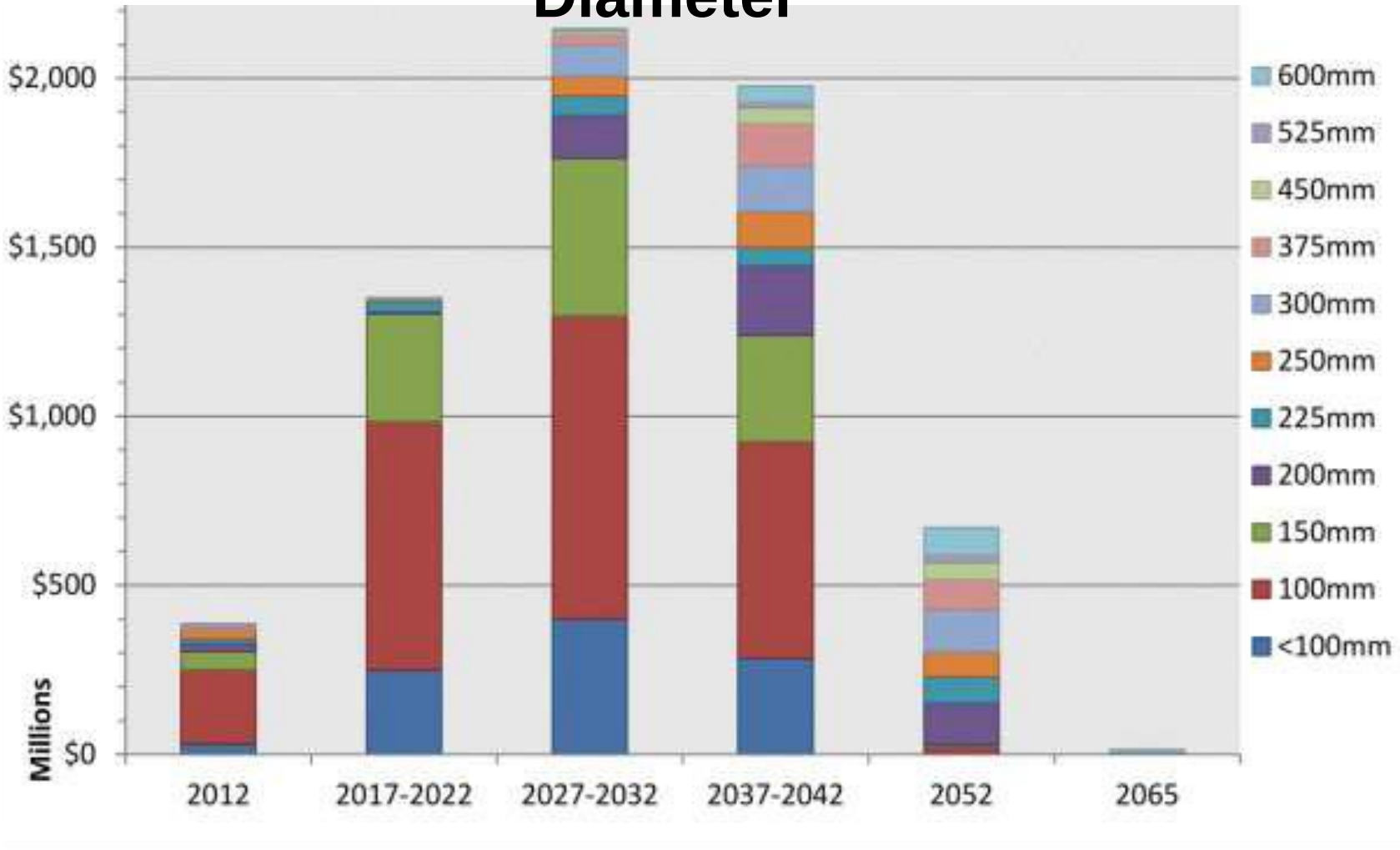
- AC pipes and appurtenances are clearly recorded on utility asset registers and GIS records
  - Provided externally through dial before you dig plans
  - Contractors must obtain before construction

- Pipes should only be accessed by licenced plumbers, contractors and water agency staff – they are not accessed by members of the public.

Current AC Pipe Rehabilitation Approaches

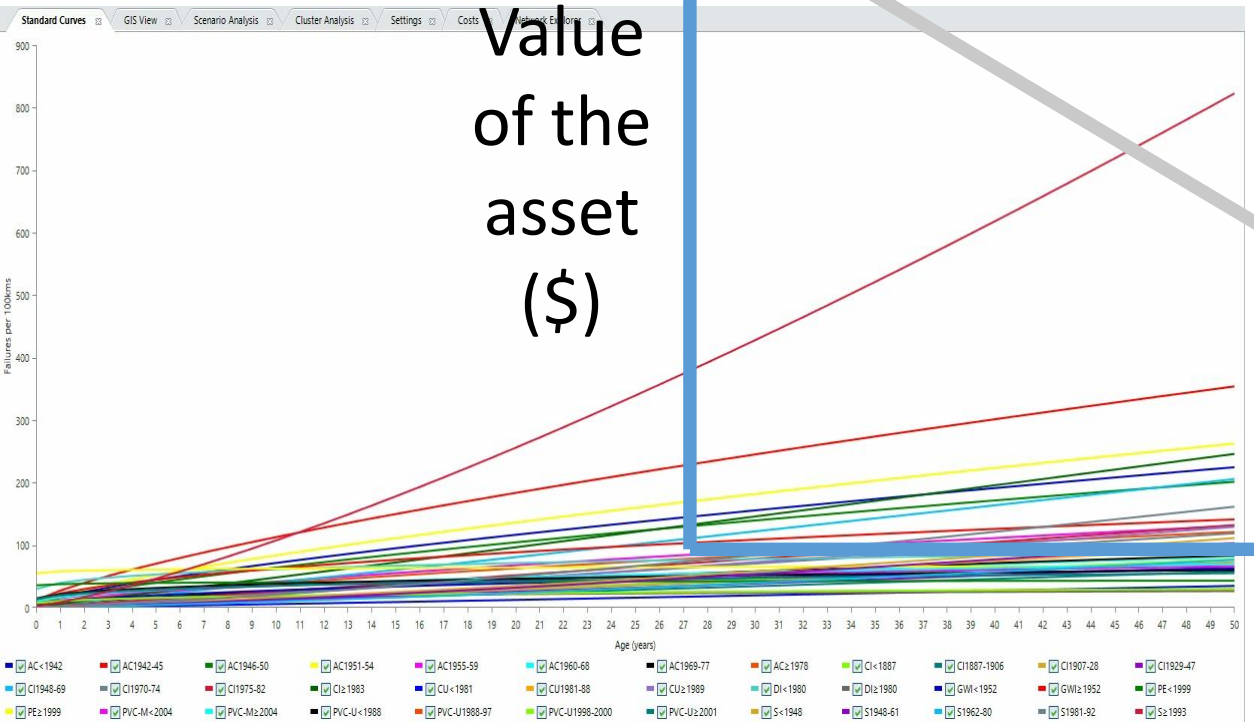
Approach	Description
Construction of new alignment	Most common approach Requires laying a new pipe and leaving existing AC pipe in existing easement
Pipe cracking/ splitting	Pipe broken in-situ (no removal from the ground) New non-AC pipe inserted into the cavity created
Spray lining	Pipe retained but sprayed with polyurethane based coating Hardens internal pipe surface to increase longevity
Slip lining	Insertion of resin coated polyester or glass fibre tube into the pipe. Air or water expands the tube to fully line the AC pipe.
Excavate and Remove	Full removal of the AC pipe, typically to landfill. Replacement of pipe with non-AC pipe

Projected Rehabilitation Costs for AC Water Mains to 2065, by Diameter

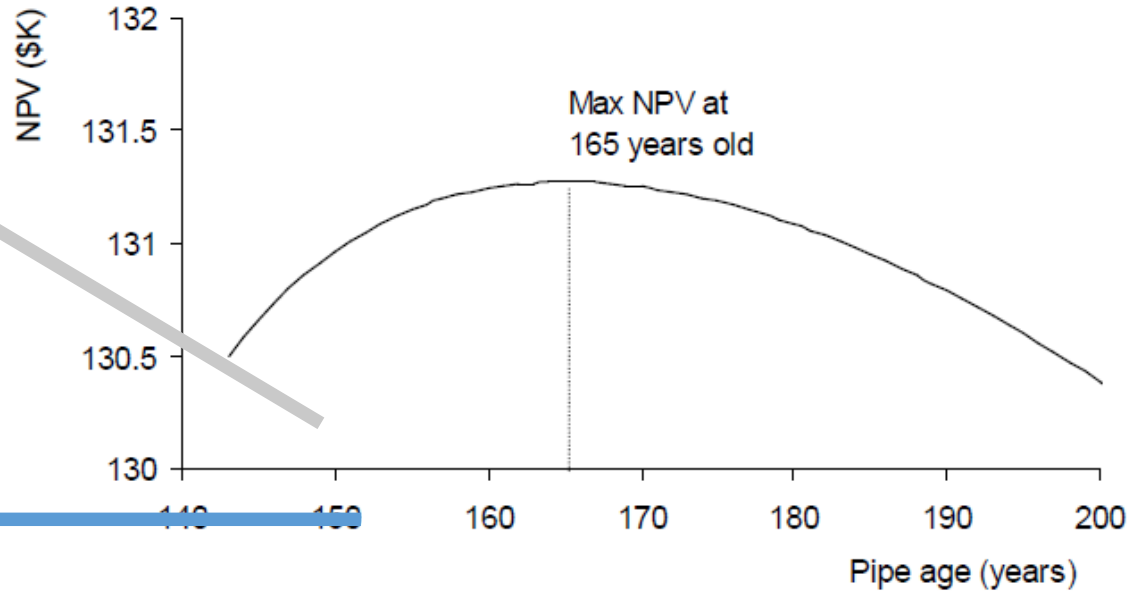


Available Prediction Approaches for AC Pipe Replacement

- Straight line depreciation/ fixed period
- Based on theoretical deterioration curves
- Field data and statistical analysis e.g. maximum NPV



Value of the asset ($)



Current Research

Project	Objective	Estimated budget
AC Pipe condition assessment	Prediction of AC pipe life and indicators to assist in predicting pipe life	$500k
AC pipe lining (Small diameter)	Effectiveness of currently available pipe lining products for AC pipe	$300k
Evaluation of pipe lining products (all larger diameter sewer and water pipes)	3-year project to develop a guideline for pipeline rehabilitation with structural pipe liners. • 30 collaborators including manufacturers, applicators, researchers, peak bodies, water utilities	$21M

Further Work

- Agreed national Framework for the management and disposal of AC water pipes
  - Working group just formed by ASEA, including WSAA
- Clear decision support tools for AC Pipe Rehabilitation
- Improved forecasting of future renewal requirements for AC pipes
- Quantification of risk exposure during rehabilitation works and understanding of future community risks

Questions

Contact information

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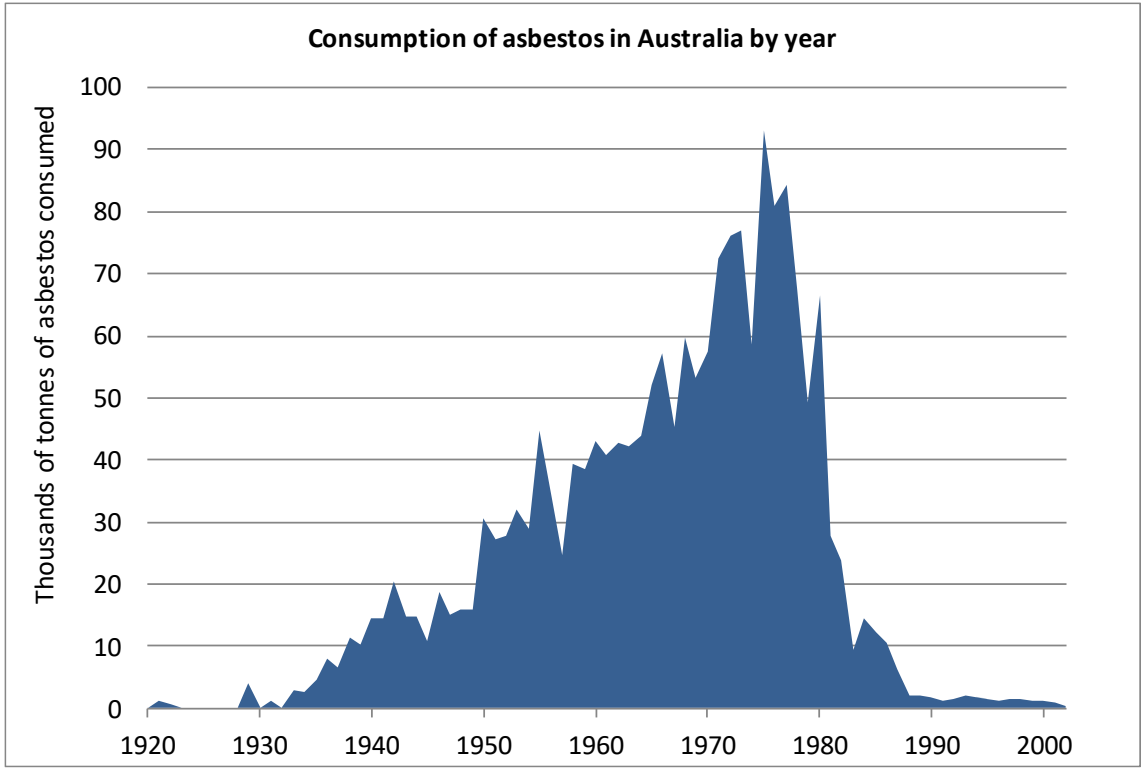
Dr Joe Pickin

blue environment pty ltd

Strategic environmental consultants

Asbestos stocks and flows

Data exists on the quantities of asbestos used in Australia by year



British Geological Society (BGS) (2015) World mineral statistics archive. Available online http://www.bgs.ac.uk/mineralsuk/statistics/worldArchive.html

Data set used by KPMG Actuaries in establishing the James Hardie trust

Asbestos stocks and flows

Data exists on the quantities of asbestos used in Australia by year

There is evidence on what asbestos was used for

(noting some variability in the early and later years of asbestos use)

Product group	Code	Total consumption (kt)	Proportion of total	Sensitivity range
Cement sheeting – Domestic	C1	4,168	32%	25-35%
Cement sheeting - Commercial	C2	2,778	22%	15-25%
Cement water pipes	C3	4,631	36%	N/A
Flooring products	C4	280	3%	N/A
Friction products	C5	53	2%	N/A
Roofing products	C6	154	2%	N/A
Other	C7	772	4%	N/A

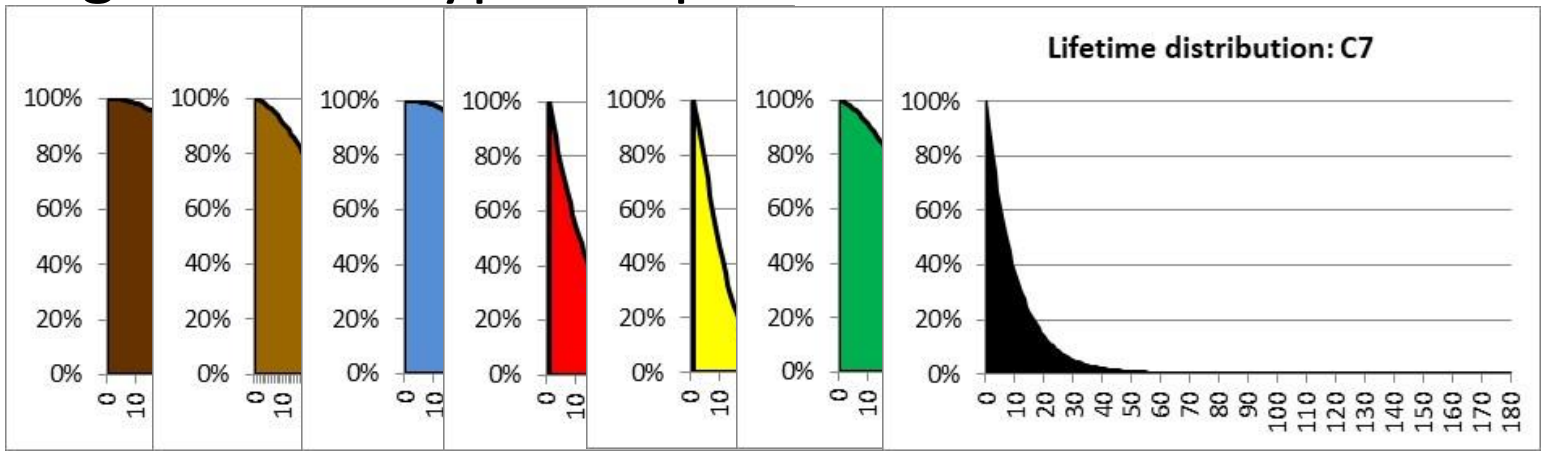
Asbestos stocks and flows

Data exists on the quantities of asbestos used in Australia by year

There is evidence on what asbestos was used for

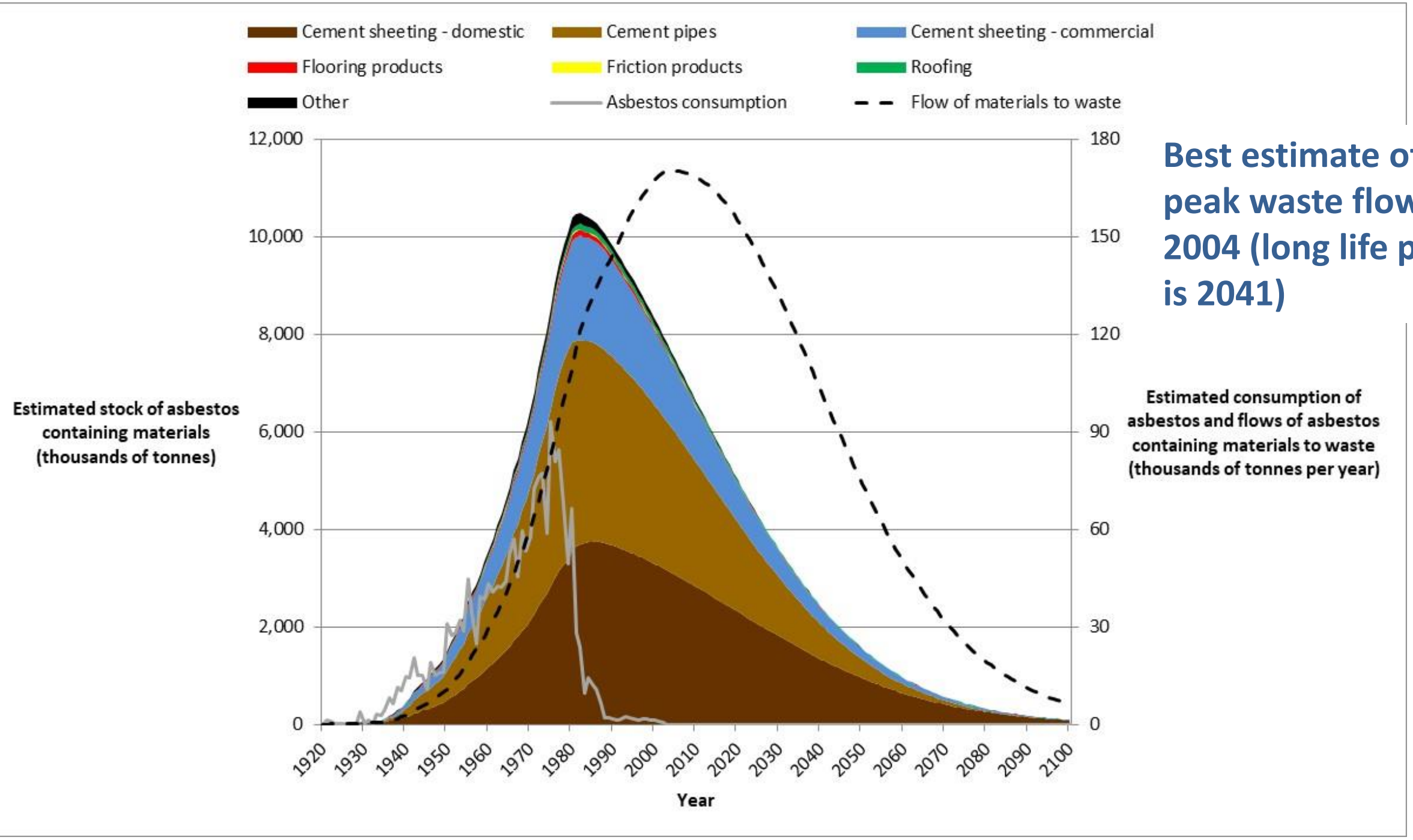
We can estimate how long different types of product tend to last

C1	Cement sheeting - domestic
C2	Cement sheeting - commercial
C3	Cement pipes
C4	Flooring products
C5	Friction products
C6	Roofing
C7	Other



Asbestos stocks and flows

We can put these together in a model to estimate asbestos waste flows



Best estimate of peak waste flows is 2004 (long life peak is 2041)

Actual flows of asbestos waste

But the model doesn't cover the biggest source of 'asbestos waste'

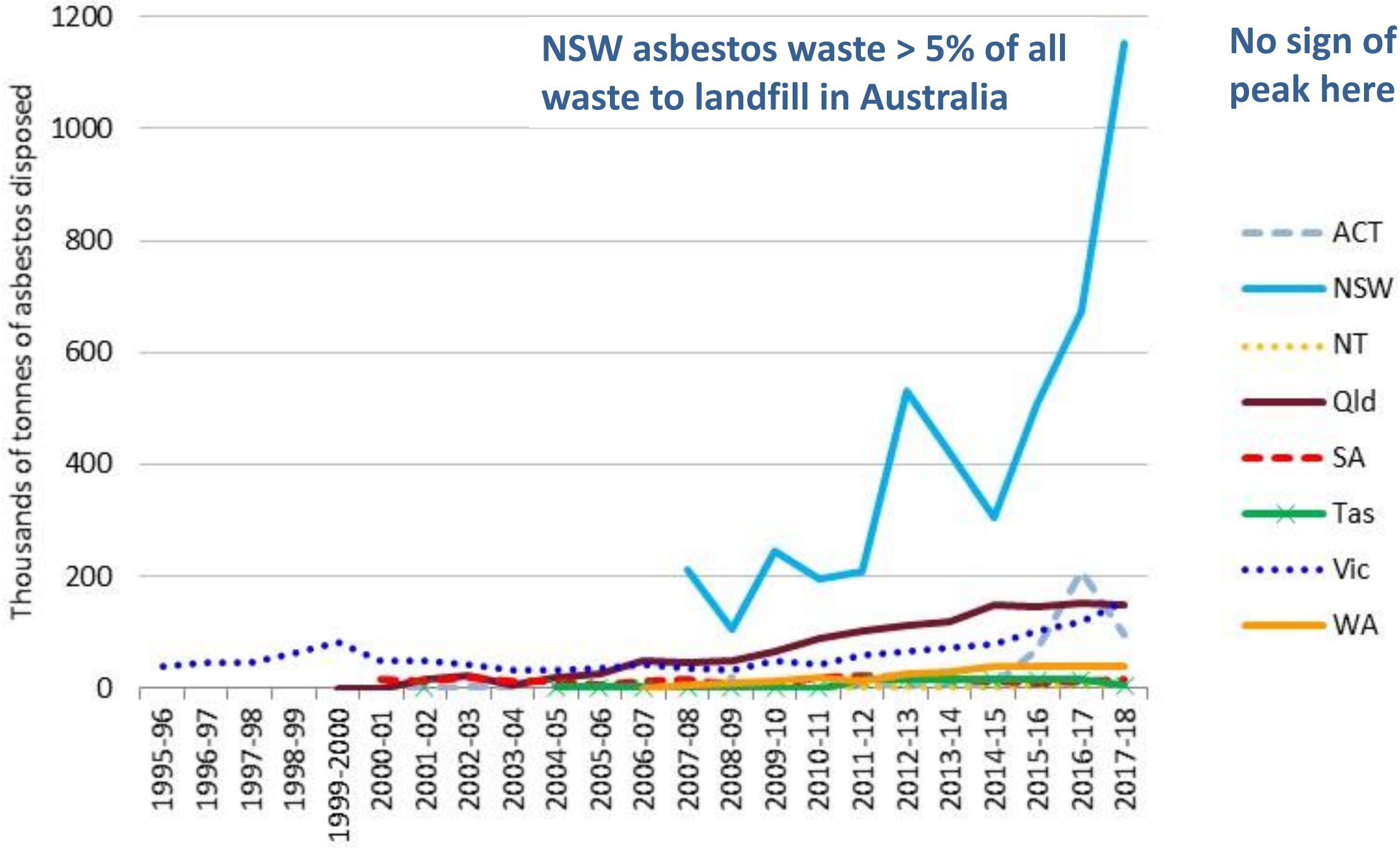
that is, the contamination legacy

- small quantities of asbestos can give rise to very large quantities of 'asbestos waste' as contaminated soil

And as we:

- improve our understanding of the issue
- tighten the regulatory environment accordingly
- continue to develop our cities …

… the quantities of asbestos waste flowing to landfills continues to rise


NSW asbestos waste > 5% of all waste to landfill in Australia
No sign of any peak here
Thousands of tonnes of asbestos disposed
1200
1000
800
600
400
200
0
1995-96
1996-97
1997-98
1998-99
1999-2000
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
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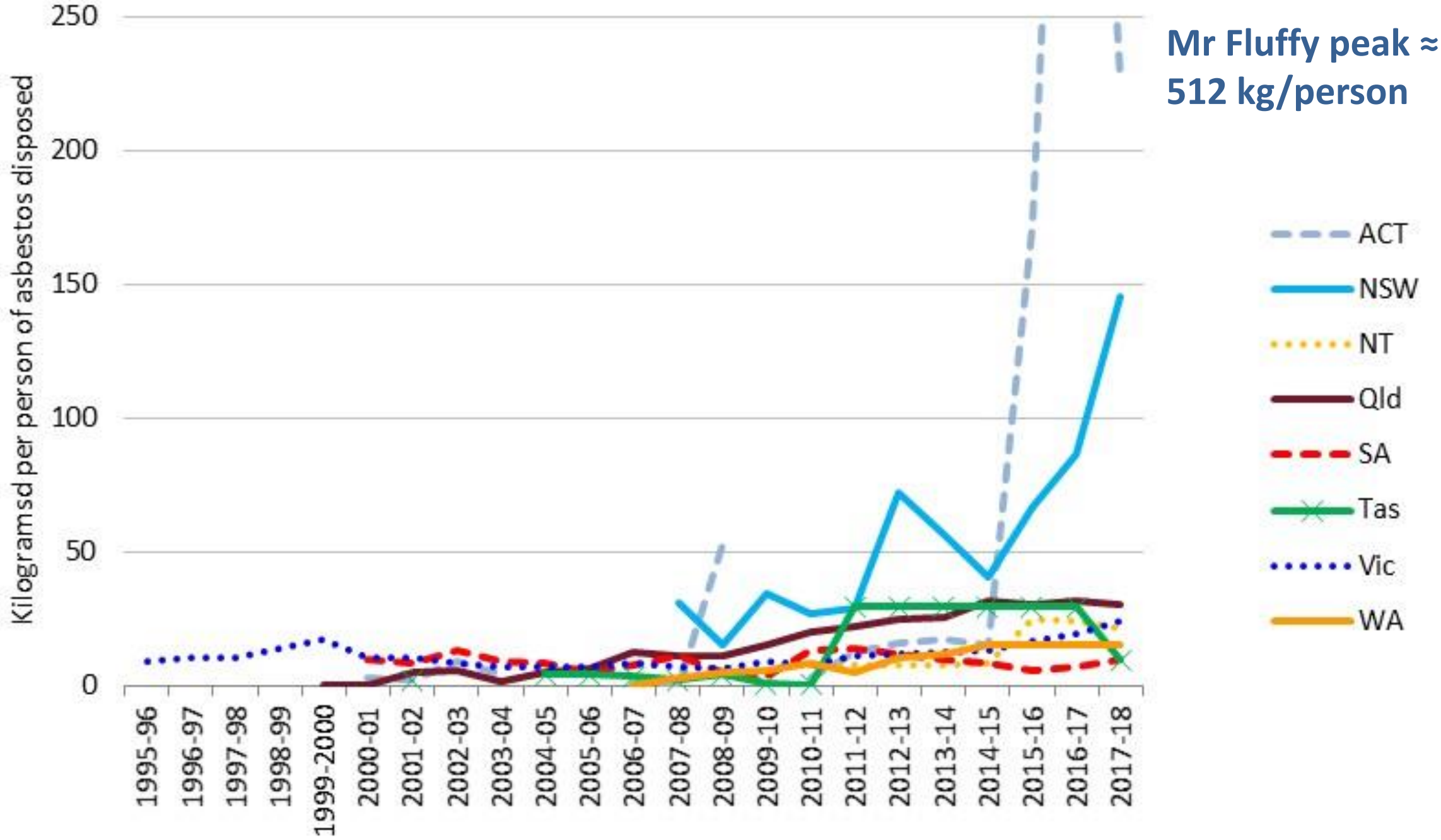
Mr Fluffy peak ≈ 512 kg/person
Kilogramsd per person of asbestos disposed
250
200
150
100
50
0
1995-96
1996-97
1997-98
1998-99
1999-2000
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
2016-17
2017-18
ACT
NSW
NT
Qld
SA
Tas
Vic
WA

What is the ideal for waste asbestos disposal?

Waste asbestos is safely transported to a landfill and then safely and indefinitely buried

Prerequisites:

- ***Asbestos industry*** : a well-functioning network of trained operators is available for asbestos removal and disposal
- ***Infrastructure*** : a convenient network of safe disposal facilities is available
- ***Disposal pricing*** : is predictable, secure and perceived as reasonable
- ***Governance systems*** : responsibilities are coordinated and balance risks & costs; regulations are tightly & consistently enforced; tracking is comprehensive
- ***Community understanding*** : high levels of understanding about asbestos and local options for appropriately disposing of it

Asbestos waste problems & their alleviation

Illegal disposal

- strong penalties
- GPS tracking in vehicles licensed to transport asbestos
- receipts to generators

Lack of convenient disposal facilities

- government help with insurances
- guidance for landfills and transfer stations
- support for asbestos infrastructure, fencing and staffing in rural areas
- consistent enforcement of standards
- if a landfill won't accept asbestos, licence a competing site

Asbestos waste problems & their alleviation

High disposal costs encourage inappropriate and illegal activity

- remove waste levies on wrapped asbestos
- keep licence fees for asbestos removal low
- ensure management requirements are not unnecessarily onerous
- encourage ‘no minimum fee’ disposal

Governance systems are not always efficient

- coordinate asbestos databases and make them accessible
- clear delineation of responsibilities
- tracking systems with separate codes for wrapped asbestos and asbestos contaminated material (WA, and now being investigated by NSW)
- national clarity and consistency on thresholds to define contamination

Thanks for your attention

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