



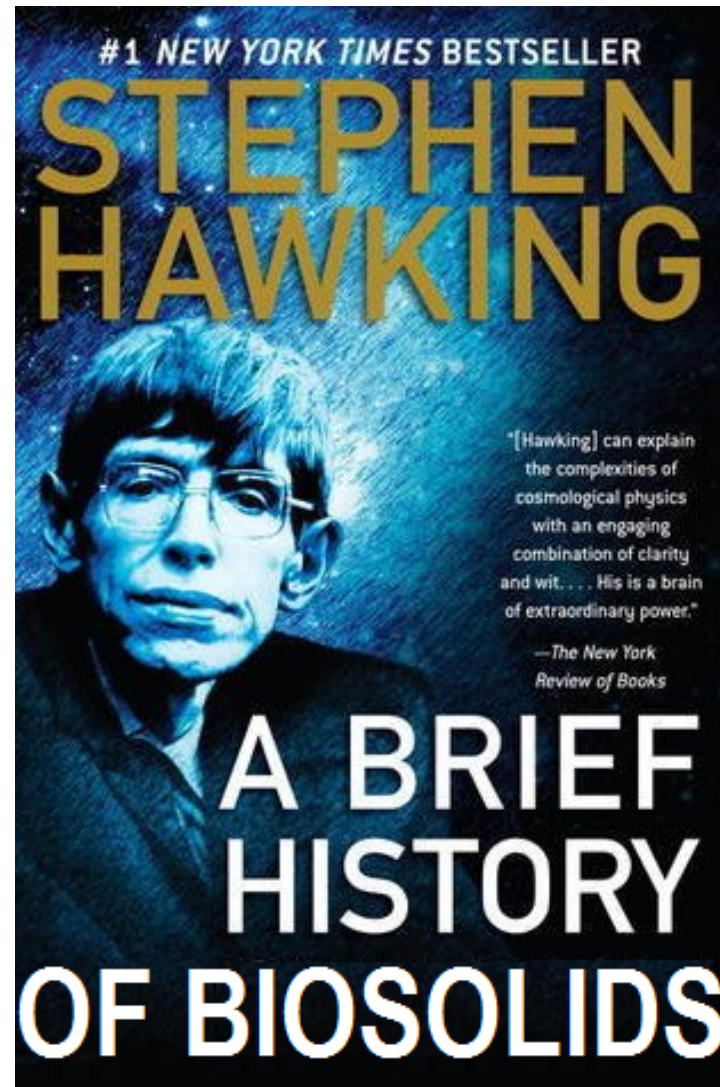
National guideline reform: now, or never?

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Biosolids regulation in Australia – A brief history



Biosolids regulation in Australia – A brief history

- 1987 NSW Dept Agriculture
- SA EPA (1996–7)
- NSW EPA [incl. QLD + ACT] (1997)
- TAS DPI (1999)
- WA DEC (2002)
- National Guidelines (NWQMS) (2004) [drawing on existing]
- EPA VIC (2004)
- SA EPA (2009) [DRAFT...]
- WA DEC (2012)
- NSW EPA (currently under review...)

Regulation of biosolids in Australia

- Most states independently developed own Guidelines
 - fragmented approach not always based on the latest evidence/science (regulators are under-resourced)
- Led some water utilities to openly criticise their state regulators regarding validity/evidence base of their Guidelines...
 - *“What is clear is that the coliphage limit (1 PFU/g) used in the 2012 Western Australian Guidelines for Biosolids Management has no scientific basis, and is excessively conservative.”* (WA Water Corp, ozwater 2014); 1 PFU/g also 10-fold below assay DL
 - VIC Smart Water Fund work (2009–13) highlighted practical issues with VIC approach for helminths w.r.t. alternate process verification
 - $>2\text{-log}_{10}$ *Ascaris* reduction impossible to verify with zero in raw

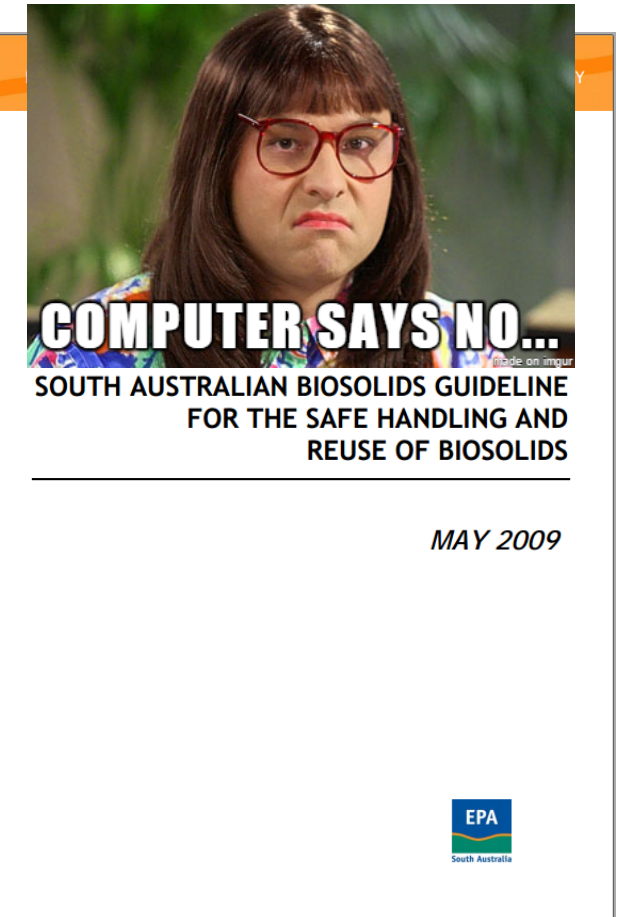
Inter-state inconsistencies in regulated quality reqmts.

- e.g. microbiological Stabilisation Grade A (T1,P1 eq.) criteria

Org.	National	NSW, QLD, ACT	SA	VIC	WA	TAS
<i>E. coli</i> (MPN/g)	<100/g	<100/g	<100/g	<100/g	<100/g	<100/g
Coliforms (MPN/g)	<100/g	<1000/g	-	-	-	<100/g
<i>Salmonella</i>	<1 or n.d./50 g	<1 or n.d./50 g	<1/50 g	<1/50 g	-	<1/100 g
Enteric viruses	<1/100 g (AP)	<1/4g	<1/50 g	<1/100 g; 3-log ₁₀ (AP)	-	-
Coliphage	-	-	<1/50 g (?)	-	<1/g	-
Helminths	-	<1/4g	<1/50 g	2-log ₁₀ (AP)	<1/50 g	-

Got worms..? Data says NO

- SA Biosolids (DRAFT) guidelines one of the most conservative nationally
 - requirement for helminths 10–50-fold above that of international guidelines
- Helminths are ‘Achilles heel’ of microbial biosolids quality criteria
 - Low I.D. + very high survival, but very low (\approx zero) abundance (+ hard to assay)
 - Disease of over-populated tropical countries with poor sanitation
 - relevance to AU?
 - All evidence so far suggests helminths most likely not present in AU raw sewage/sludge → hang-up from US EPA (<1/4g) Part 503 reg. Time to let go...?



Problems with under-performing regulations for industry

- 2004 National guidelines adopted 'precautionary principle' in absence of good data and were commensurately conservative
- Overly (and/or unnecessarily) conservative regulated treatment requirements increase cost and constrain *beneficial* reuse
 - e.g., long-term (3 y) storage = increased WWTP infrastructure needs (hardstand area) + up to 90% loss of N and org. C + reduced P solubility + decreased water-holding capacity + higher GHG emissions (plausibly)
- Recent examples where utilities have sought to 'side-step' regulated performance/quality parameters (SEW, SAW, others?)
 - Guidelines do allow for this, but costly/inefficient to seek *ad hoc* approvals for alternate process performance verification
 - opportunity to take learnings from last 15+ y of research & water utility validation programs to update and consolidate National Guidelines

Problems with under-performing regulations for industry

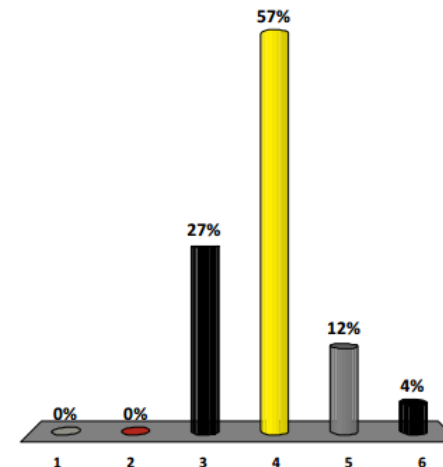
- Non-risk-based approach is expensive
 - costly end-point verification monitoring vs. agreed multiple barrier performance accreditation up-front
- Need to move to risk-based regulatory approach (as per ADWG, AGWR)
 - always the intent ever since the earliest state/national guidelines, but hasn't happened yet... why not?

National Guideline reform – what did we think last time?

- ≈30% saw state-based guidelines as needing major overhaul
- ≈60% in favour of national/consolidated approach

6. What is the best legislative approach for managing biosolids?

1. Current Approach
2. Slight updating of Victorian guidelines
3. Major review/updating of Victorian guidelines
4. National Code of Practice
5. Reclassifying biosolids
6. Uncertain



National guideline reform/consolidation: now, or never?

- Industry, academia and regulators (in principle) seem to agree it's a good idea
- 2004 National Guidelines were along similar lines:
 - *“...the principles that can form the basis for a common and national approach to the management of biosolids”*
 - *“It is not possible to base these guidelines on strict quantitative risk assessment principles, as appropriate research is yet to be completed.”* → Are we there yet
 - NSW (1997) guidelines were *“...a step towards producing revised guidelines based on risk assessment.”* – 20 years later...?
- What might a revised National Guideline look like?
 - Single unified Guideline (feasible?); state-based hybridisation based on a substantially revised ‘National Best Practice’ backbone?
 - Risk-based (quantitative microbial/chemical risk assessment)

Future risk factors for beneficial reuse *status quo*

- Water industry and regulators have done lots to improve biosolids quality and reduce risks from beneficial reuse
 - trade waste control of metals and priority organic pollutants...
- Unfortunately, years of good work can quickly unravel via disgruntled/disaffected/misinformed communities (e.g., Nicola Valley, BC)



Future risk factors for beneficial reuse *status quo*

- Possible risk factors to beneficial reuse *status quo*:
 - Pathogens (low risk)
 - Odours (low-to-med. → watch)
 - Emerging organics/PPCPs/EDCs (low-to-med. → watch)
 - Antibiotic resistance (low-to-med. → watch)
 - Classical (in)organics (low[-to-high] → agricultural LCA risk)
- A National Guideline reform project would seek to address the above by providing latest evidence base to regulators/industry
- Is such a reform project needed (now or never); if “yes”, how can it be initiated and who will fund it?

