



# B6: The development of sustainable remediation in Australia

**Dr Garry Smith**

- Geosyntec Consultants
- Chairman of SuRF ANZ

SuRF ANZ = The Sustainable Remediation Forum of Australia and New Zealand



# The development of sustainable remediation (SR) in Australia



- ◆ Principles behind SR implementation in Australia
- ◆ Criteria behind key pillars of SR here
- ◆ Levels of implementation in Australian States
- ◆ Some case examples

# The principles behind sustainable remediation in Australia



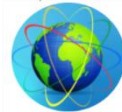
- ◆ Australian historic national affirmation of the concept and principles of sustainability
  - Rio Earth Summit 1992
  - Brundtland and World Commission reports and Australian reports
  - Australian inter-governmental Agreement on the Environment 1992 – State government legislation evolves
  - Framed as ‘Ecologically Sustainable Development’ (ESD)
- ◆ Includes devolution to industry practice = ‘branding plus responsibility’
  - e.g. Infrastructure Sustainability Council of Australia’s ‘Infrastructure Sustainability Rating Scheme’ ([www.isca.org.au](http://www.isca.org.au))
- ◆ SR may be considered to lead on from ESD in developing practical details for application

# The principles behind sustainable remediation in Australia (cont)



## ◆ SuRF ANZ

- Developed c. 2009 + and formally launched in 2012
- Currently a practice forum (membership - based) of ALGA
- Part of evolving SuRFs International Alliance ('IASRF')



- Reliance on a **Framework** for industry SR practice
- Canvases and communicates with members
- Supports SR practice **tools** application and **training** (including an annual industry 'SR Prize')
- Dialogues with regulators and policy makers as requested

# Criteria behind pillars of SR in Australia

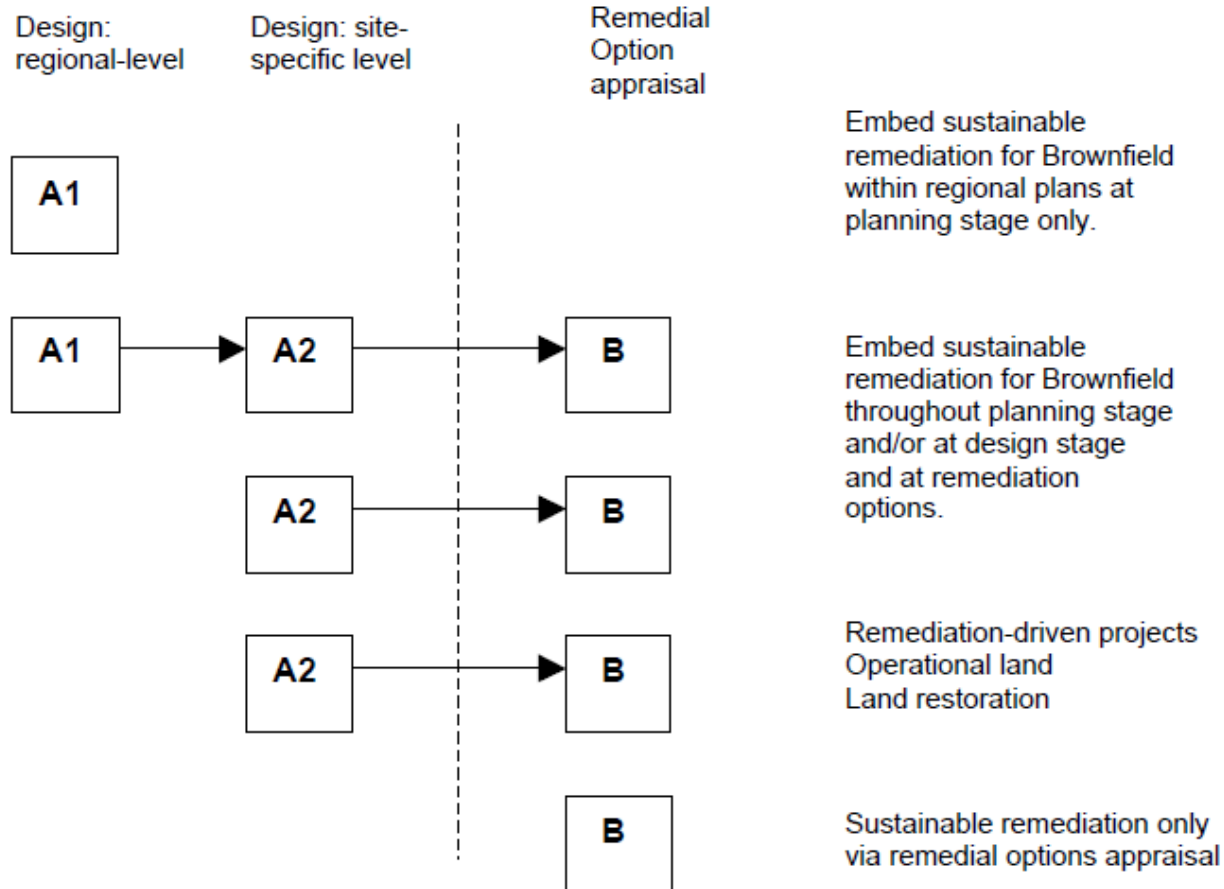


- ◆ Human Health and Ecological Risk Mitigation
  - A fundamental pillar
- ◆ Stakeholder engagement in remediation: Risk prioritisation dialogues
  - Strong Australian tradition of stakeholder dialogue
- ◆ Regulatory engagement and cooperation
  - e.g. respect for ‘community visions’ in catchment management
- ◆ Acknowledged role of cost benefit analysis including industry project costs as one aspect of sustainability

# Illustration 1: 'Reliance on a Framework for SR in Australia'

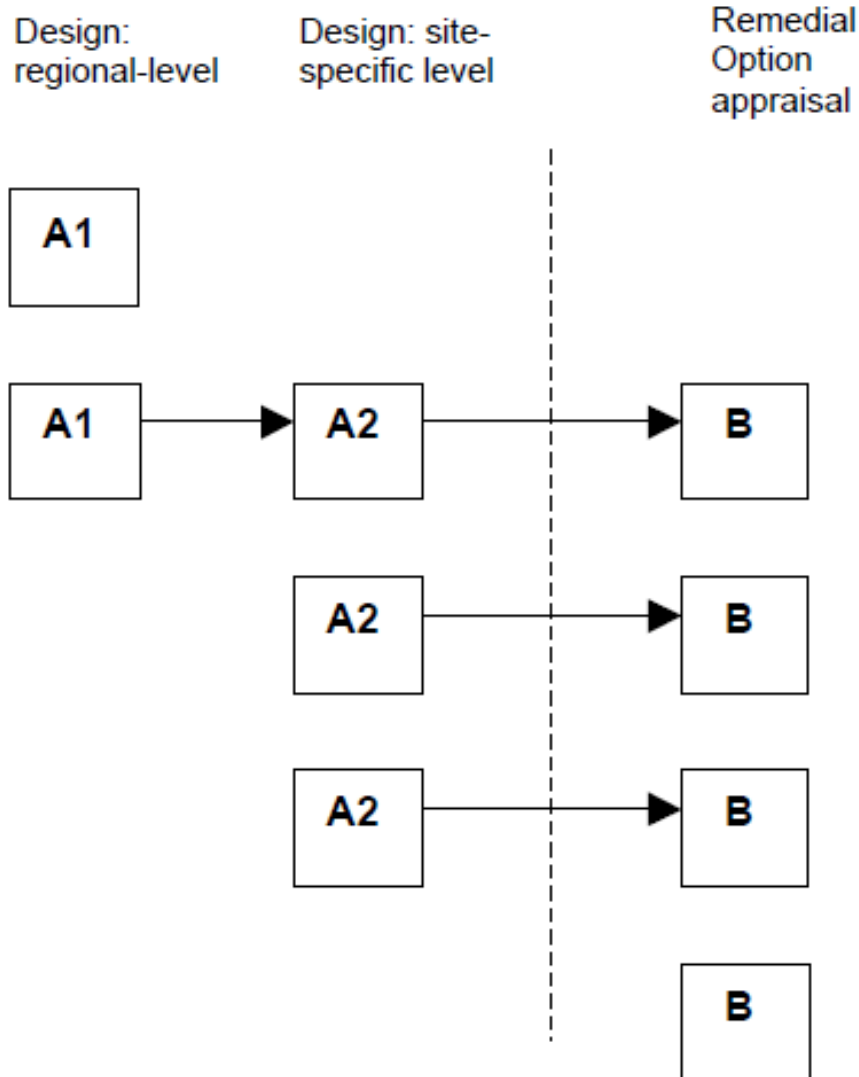


## Use of a Framework for Different Remediation Scenarios



SuRF ANZ: Developed from SuRF UK

# 'Risk-informed Sustainable Remediation'?



Embed sustainable remediation for Brownfield within regional plans at planning stage only.

Embed sustainable remediation for Brownfield throughout planning stage and/or at design stage and at remediation options.

Remediation-driven projects  
Operational land  
Land restoration

Sustainable remediation only via remedial options appraisal



# Illustration 2: 'Acknowledged role of cost benefit analysis'



- ◆ Recently developed methodology for ranking Australian remedial technology options for sustainability in a typical soil remediation project setting (derived from a SuRF UK procedure):

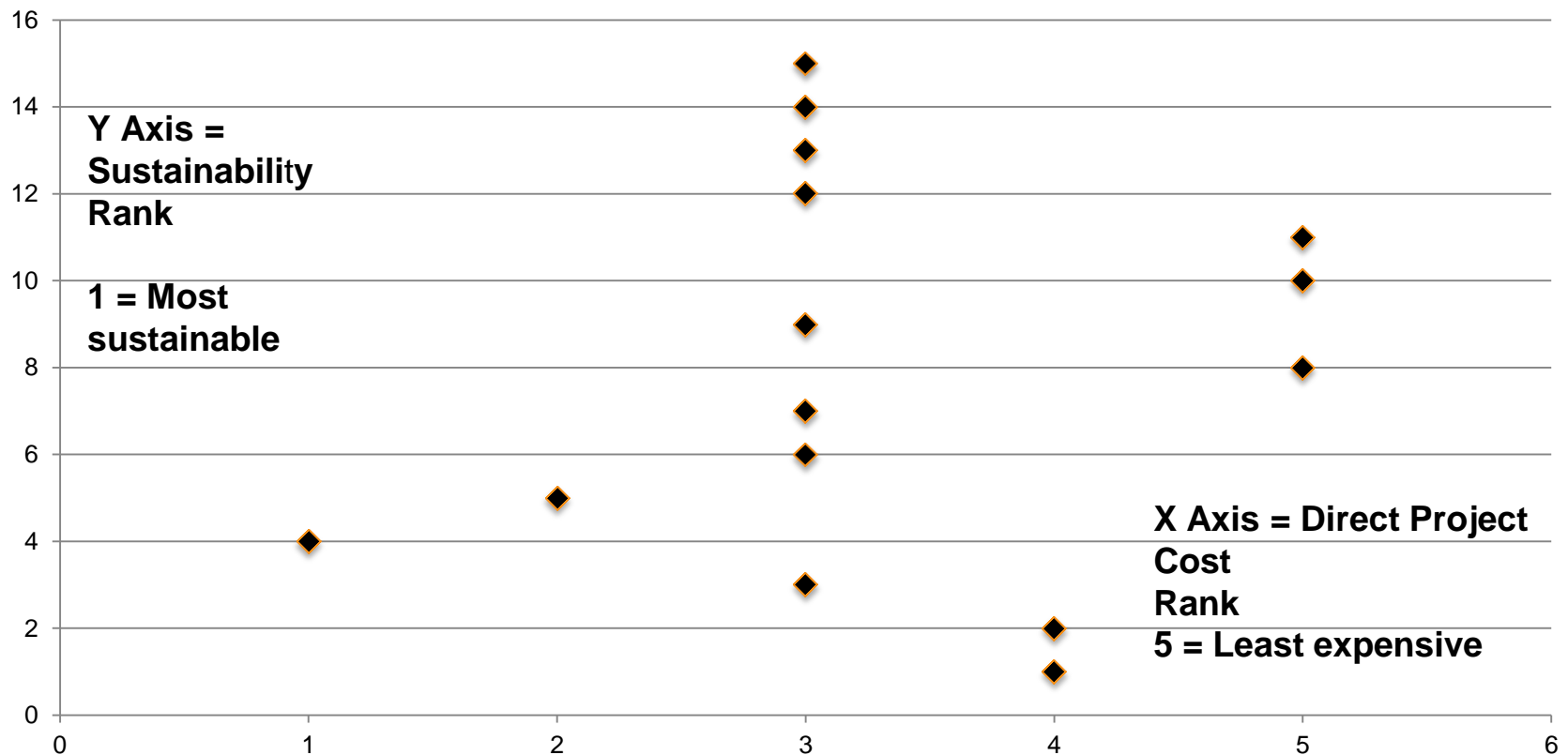
Method	Eff.	Prac.	Sub-total ExP	ENV	SOC	ECON	Sub-total E+S+E	Total	Rank
ESDD – OCE & ECS	5	2.5	12.5	4.3	2	3.8	10.1	22.6	3.0
ISCT	5	3	15.0	3.2	4.625	4.3	12.1	27.1	1.0
ISRT	5	3	15.0	2.7	4.625	4.3	11.6	26.6	2.0
ESCT DTD – OCE & ECS	5	2	10.0	3.2	4.875	4.5	12.5	22.5	5.0
ESCT ITD - OCE & ECS	5	1.5	7.5	3.5	4.375	4.6	12.5	20.0	4.0

**Source: J Hunt and G Smith  
Remediation Australasia, 2015,  
Issue 17, In Press**



# 'Role of cost benefit analysis including industry project costs'

- ◆ Technology choice: Sustainability rating versus Up-front project costs shows SR effectiveness for 'remediation cost bottom line'



# Level of implementation in Australian States



## ◆ Victorian EPA

### Victorian Environment Protection Act 1970:

#### 1B. Principle of integration of economic, social and environmental considerations

- (1) Sound environmental practices and procedures should be adopted as a basis for **ecologically sustainable development** for the benefit of all human beings and the environment.
- (2) This requires the effective **integration of economic, social and environmental considerations** in decision making processes with the need to improve community well-being and the benefit of future generations.
- (3) The measures adopted should be **cost-effective** and in proportion to the significance of the environmental problems being addressed.

**Conclude: it is consistent with State legislation to consider Sustainable Remediation**

**Sources: P Nadebaum; Victorian EPA**

# Level of implementation in Australian States (cont)



- ◆ NSW EPA
- ◆ Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997
  - Finalised July 2015 at <http://www.epa.nsw.gov.au/clm/guidelines.htm>
  - Reiterates Contaminated Land Management Act – “ensure that contaminated land is managed with regard to the principles of **ecologically sustainable development**”.
- ◆ Will more explicitly require consideration of sustainable remediation when Guidelines reviewed e.g. within the **Remedial Action Plan**:
  - Discussion of the extent of remediation required
  - Discussion of possible remedial options and how risk can be reduced
  - Rationale for the selection of recommended remedial option
  - Proposed testing to validate the site after remediation
  - Contingency plan if the selected remedial strategy fails....

Source: NSW EPA

**Conclude: Guidance supports/directs and assists sustainable solutions**

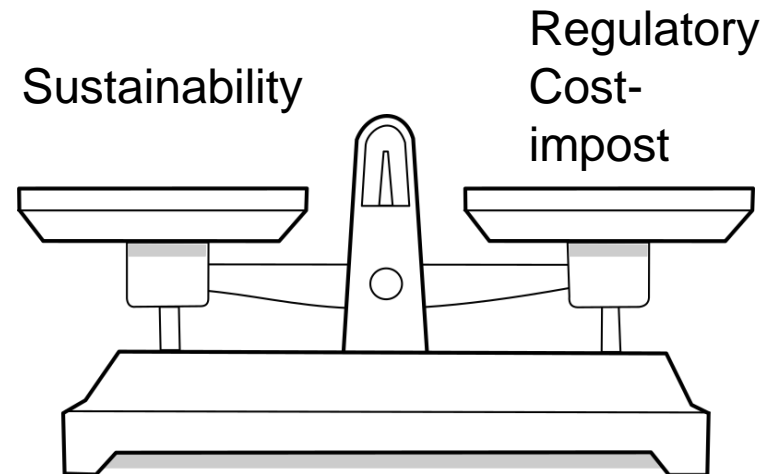
# Level of implementation in Australian States (cont)



- ◆ Useful recent feedback from another Australian state regulator:

‘Industry/developers might engage sustainable remediation concepts and capabilities earlier in the project lifecycle rather than at completion/closure so that sustainable remediation is not perceived as a reason for minimal remediation’.

- ◆ Another regulatory balancing act:



# Case study 1: Rhodes Sydney



- ◆ Highly contaminated orphan industrial site early 2000s
- ◆ Solution was brownfield remediation and redevelopment
- ◆ Underwent extensive established Australian planning, regulatory, and community engagement assessment
- ◆ Preceded formal sustainability appraisal era
- ◆ Faced considerable contaminant assessment and risk uncertainties and ‘surprises’
- ◆ Lessons learned:
  - Marriage of planning and environment protection assessments works
  - ‘Triple bottom line’ inputs assist project survival and delivery
  - Forerunner of more SR-based regulatory dialogue, project design, and project planning in Australia.

# Case study 2:

## Petrochemicals in Groundwater



ICCL  
international  
committee on  
contaminated  
land

- ◆ A Solar Thermal Aerobic Groundwater Recirculation Remediation System
- ◆ Coffey (Patent) – Western Australian initial project
- ◆ Target markets: retail petroleum site divestment; former landfills; brownfield and petrochemicals
- ◆ Temperature-based enhanced bioremediation method
- ◆ Oxygenation enhanced
- ◆ Automated groundwater circulation and ground reinjection system

Some sustainability features:

- ◆ Low cost (avoids multiple chemical amendment treatments)
- ◆ Minimal social impact (vapour and waste free plus low noise)
- ◆ Solar-powered (very low greenhouse gas emission profile)



# Thankyou

[GJSmith@Geosyntec.com](mailto:GJSmith@Geosyntec.com)

+61 419 12 8922

