



REMTECH  
Europe

## ISO 18504 on sustainable remediation

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Session 3: Sustainable remediation and innovative technologies  
Friday 21<sup>st</sup> September 2018 (9h30–13h30)

*RemTech Expo 2018 (19, 20, 21 Settembre) FerraraFiere*

[www.remtechexpo.com](http://www.remtechexpo.com)

Sound science –  
defensible decisions



# (some) EU Legal Drivers for Remediation

- Environmental Liabilities Directive
- Industrial Emissions Directive
- Water Framework Directive
- Mines Waste Directive

Investigate

Risk Assess

Select  
strategy

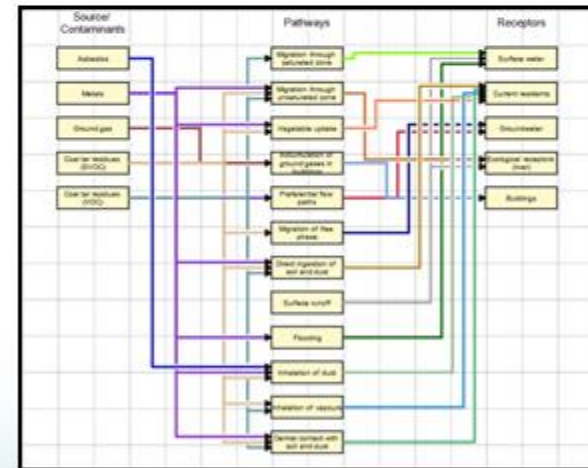
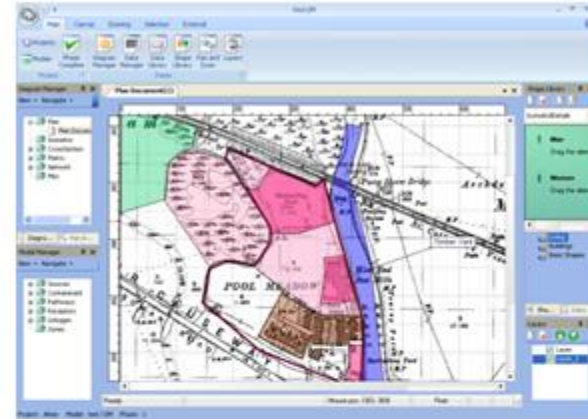
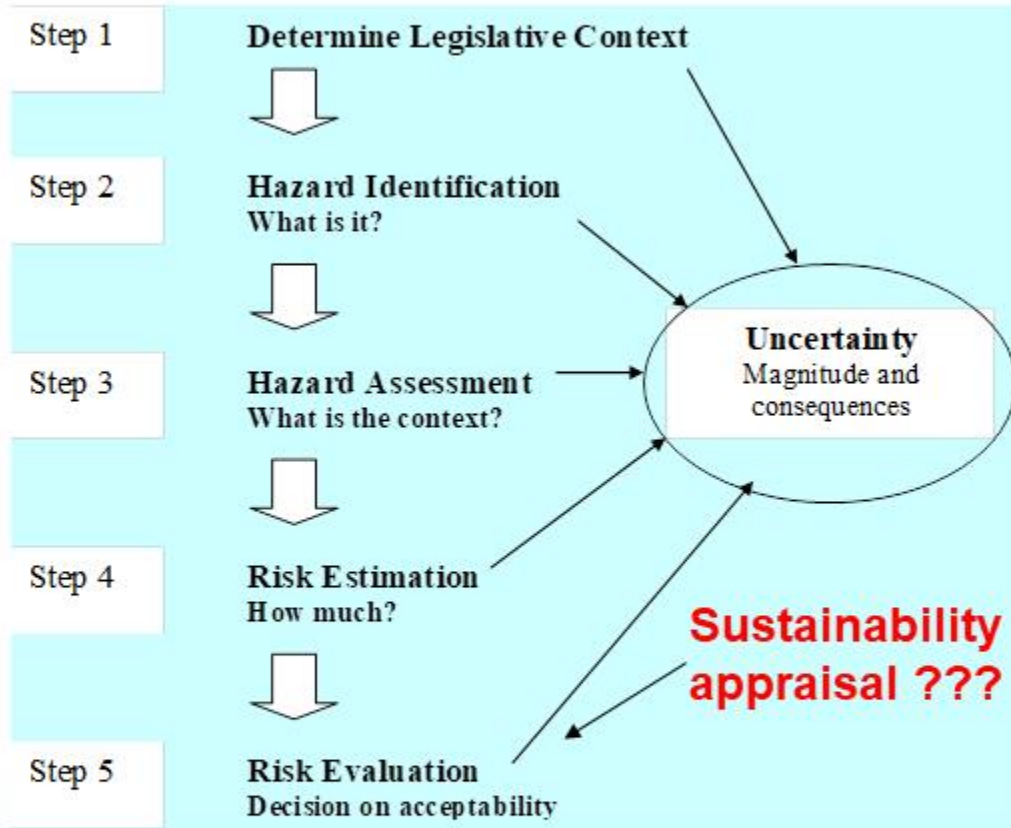
Implement  
remediation

Redevelop

# Risk based contaminated land management

The process

The method: conceptual site model



After McCaffrey, Street & Nathanail 2007  
SNIFFER UK CC02

[www.keycsm.com](http://www.keycsm.com)

Investigate

**Risk Assess**

Select strategy

Implement remediation

Redevelop

defensible decisions

# Remediation: paying for past sins

*an economic externality*

- Should *demonstrably* break the contaminant-pathway-receptor linkage by
  - Removing, destroying, modifying the source
  - Interrupting the pathway
  - Modifying the nature or behaviour of the receptor
- Can include
  - Long term monitoring
  - maintenance
- it is not sustainable *per se*
- It is usually not the main aim of a project

# Sustainable Remediation

Elimination and/or control of unacceptable risks  
in a safe and timely manner

**whilst optimising the environmental, social and  
economic value of the work (BS ISO 18504:2017)**

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graph LR; A[Investigate] --> B[Risk Assess]; B --> C[Select strategy]; C --> D[Implement remediation]; D --> E[Redevelop]
```

Investigate

Risk Assess

Select  
strategy

Implement  
remediation

Redevelop

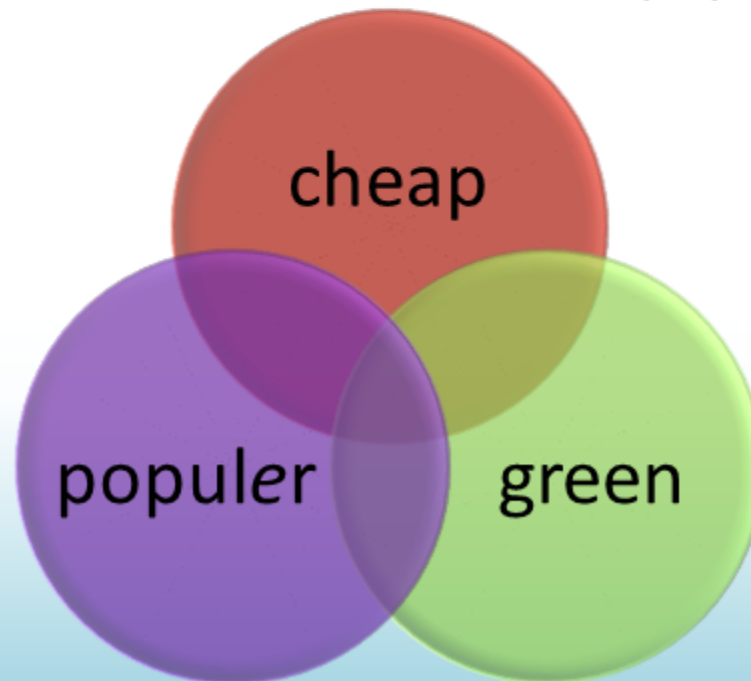
# Sustainable Remediation

## Essential

- Breaks the linkage
- On time
- On budget
- Bells
- whistles

## Desirable

- As (cheap, green, popular) as possible



# ISO 18504:2017

24  
pages!

- 1 Scope
  - 2 Normative references
  - 3 Terms and definitions
  - 4 Abbreviations used in this document
  - 5 Sustainable remediation, (re)development and regeneration
  - 6 Risk based contaminated land management
  - 7 Integrated assessments, metrics and evaluations
  - 8 Decision making
  - 9 **Economic dimension**
  - 10 **Social dimension**
  - 11 **Environmental dimension**
  - 12 Indicators and metrics
  - 13 The role of sustainable remediation assessment tools
  - 14 Communication
  - 15 Promoting sustainable remediation
  - 16 The role of governance and institutional structures
- Bibliography

# scope

This document provides **procedures** on sustainable remediation.

In particular, it provides:

- **standard methodology**, terminology and information about the key components and aspects of sustainable remediation assessment;
- informative advice on the **assessment of the relative sustainability** of alternative remediation strategies.



# *relative* sustainability of alternative remediation strategies

GIVEN that remediation is needed, what is the most sustainable way of carrying out that remediation? Can it be done more cheaply? Can that way be made greener?

- Risk assessment: there is a need to remediate
- Options appraisal: short list of remediation strategies
- Compare net social, environmental and economic impacts of each short listed strategy
- Choose the **most sustainable** of the short listed strategies
- [value engineering of chosen remediation strategy]
- [green chosen remediation strategy]
- **DO IT!**
- Verify it worked – and produce a report

# Some [very important] definitions

## INDICATOR

single characteristic that represents a sustainability effect, whether benefit or negative impact, which **may be compared across alternative remediation strategies**, comprising one or more remediation techniques and/ or institutional controls, **to evaluate their relative performance**

***Agreeing indicators that are site specific, remediation strategy relevant is key***

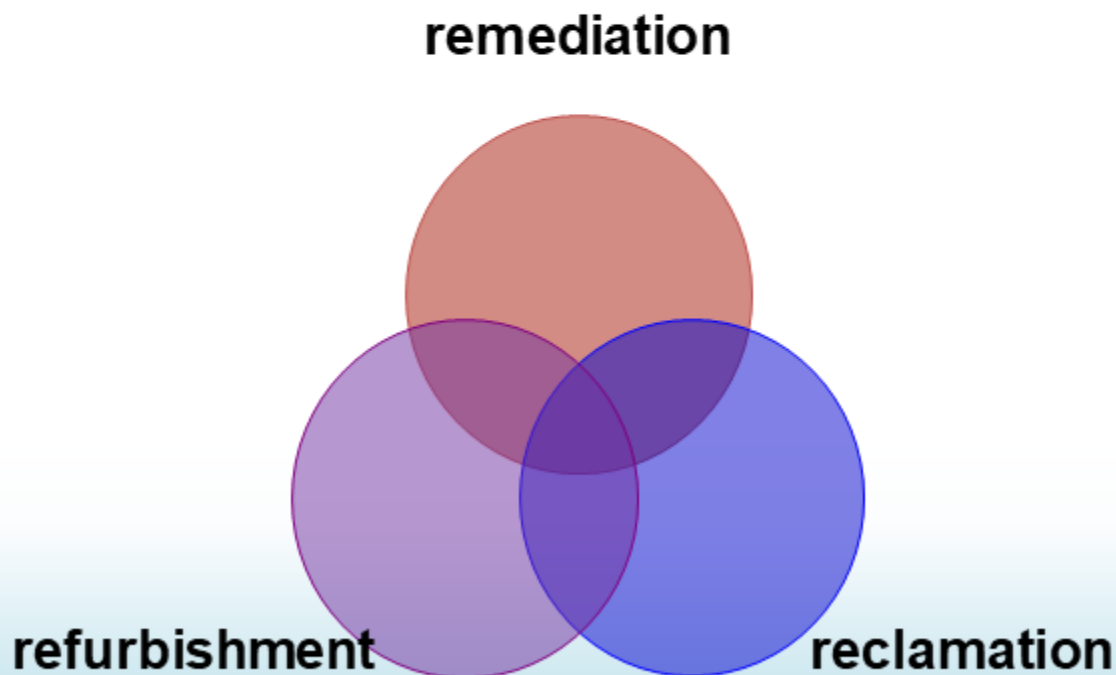
## METRIC

measurement of an indicator

# Remediation is not enough

- Remediation
- Reclamation
- Recycle
- Redevelopment
- Refurbishment
- Reuse
- Redeploy
- Regenerate
- Revitalise
- **RENEW**

The sum must be greater  
than the parts



# A (quick) checklist

Has there been *documented* consideration on how to make the selected remediation strategy:

- ✓ Cheaper
- ✓ Greener
- ✓ More Popular

# A warning list

*of inadequate justifications*

- It uses renewable energy
- We saved some money
- We drove to the site less frequently
- Less waste was produced
- We had a family open day during the remediation works
- It's bioremediation

# Checklist for using BS ISO 18504:2017 on a specific site

- Objectives – risk reduction
- Short list of technically valid options
- Site specific indicators
- Strategy relevant indicators
- Environmental ranking/ rating
- Social ranking/ rating
- Economic ranking/ rating
- Overall appraisal - Is there a clear 'winner'?
- Document the process and its outcome

In addition – (optional) - has there been consideration on how to make the remediation:

- ✓Cheaper
- ✓Greener
- ✓More Popular?



# ISO 18504:2017

## Sustainable remediation

Regular participants at online meetings:

L Bakker (NL), P Bardos (UK), Y Furukawa (J), A Nardello (I),  
G Smith (AUS), J Smith (UK), M Smith (UK),  
P Nathanail (UK, chair), **Gabriele Goetsche (DIN secretary)**

**THANK YOU FOR YOUR ATTENTION,**

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