

SoBRA LNAPL subgroup

David Holmes
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Why NAPL?

- Measurement of contaminated land risk relies on understanding sub-surface processes.
- NAPL can be difficult to measure, so Conceptual Site Models may be data deficient
- Lots of good guidance from ITRC and CL:AiRE in recent years focusing on key LNAPL concepts, but a little light on practicalities

In theory:



But often:



https://commons.wikimedia.org/wiki/File:FEMA_-_31024_-_Oil_spill_clean_up_in_Kansas.jpg

Aims

SoBRA core objectives:

- To encourage “good practice” in the practical applications of risk assessment to support decisions regarding the appropriate management of land contamination.
- To facilitate and widen access to the dissemination of knowledge regarding land contamination risk assessment.

For NAPL:

- To support technical excellence in the assessment, estimation and evaluation of risks associated with NAPL.
- To encourage best practice by delivering ***practical*** advice to support decisions regarding the appropriate management of NAPL risks;
- To develop guidance in a timely manner,
- To periodically represent SoBRA at conference in respect to the sharing of learning outcomes.

Structure

- Aim to fill the gaps in guidance:

Context for the UK approach and regulatory signposts	Introductory document
Exploring the possibility of NAPL on site. It is present and what are the options?	Solubility Spreadsheet
	NAPL mobility screening tool
NAPL confirmed: choice of monitoring, how to carry out a useful test and what the results may mean.	NAPL monitoring options and their respective pitfalls
	Assessment of baildown tests
	NAPL transmissivity and LNAPL residual saturation
NAPL to be removed. How do the options influence the risk of what remains?	Choosing the right remediation



Introductory document

(Duncan Cartwright)

- To provide regulatory context and overall objectives
- Brief discussion about current Risk Assessment tools.
- Highlight differences in regional legislation

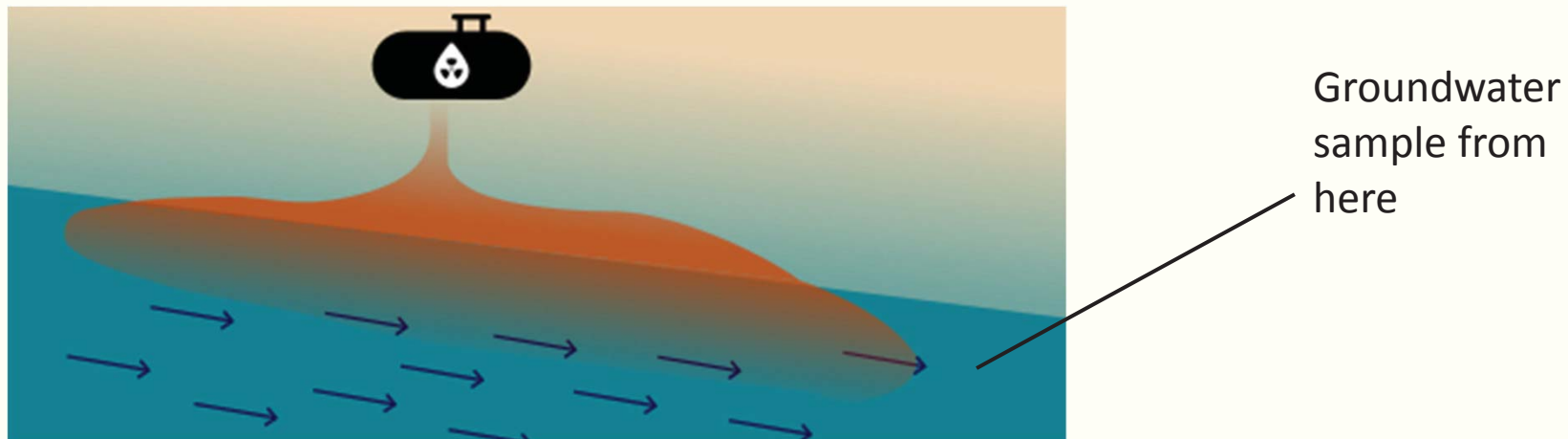
England and Wales	Scotland
...remove or control [mobile or residual NAPL] where its [migration or dissolution or volatilisation] could present an unacceptable risk...	...entry means actual dissolution of the substance from the material into the water environment...

- Provide pointers as to what the SoBRA guidance is for (to supplement, not to replace).

Solubility Spreadsheet

(Caroline Walker)

- Calculate effective solubility of hydrocarbon compound based on Raoult's law
- NAPLs are generally complex mixtures; effective solubility depends on mixture



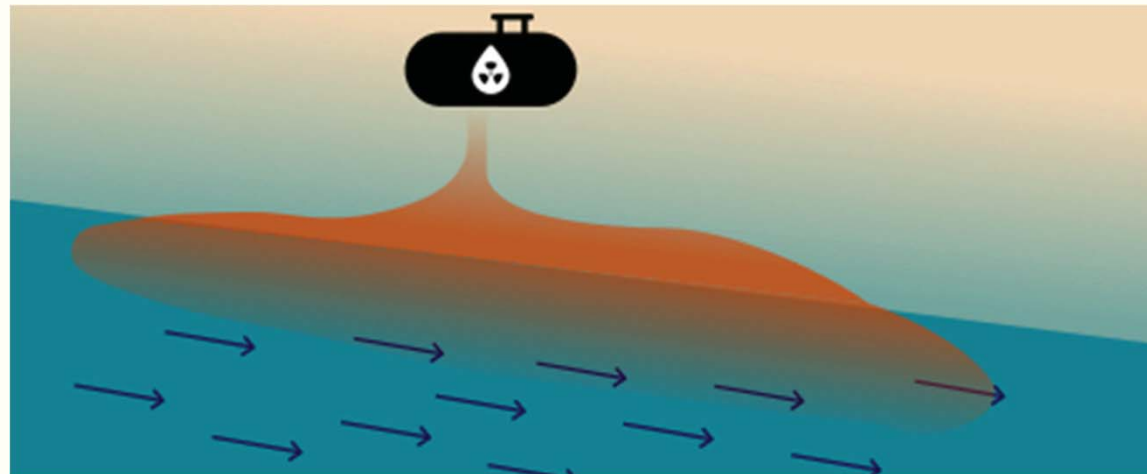
- What do these results mean? Could there be trapped NAPL?
- Site-specific data can be used in the calculator: not just literature values.

NAPL mobility screening tool

(Anna Hitchmough)

- NAPL detected: what next? How to develop the CSM
- Reference to available guidance for unsaturated zone nomographs, L- and DNAPL manual appendix equations.

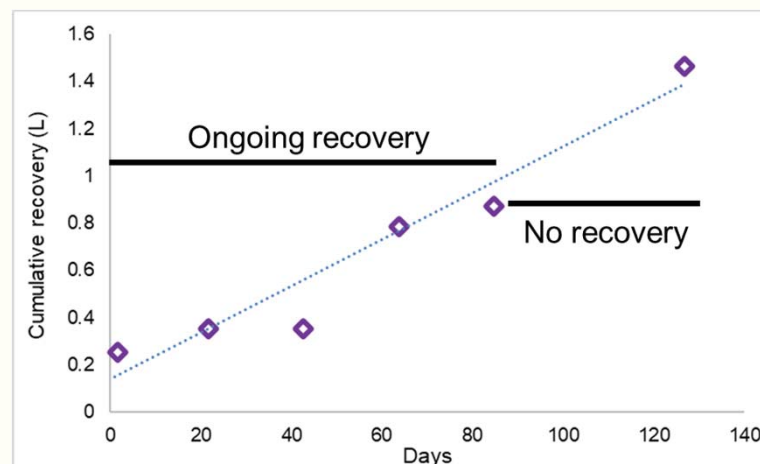
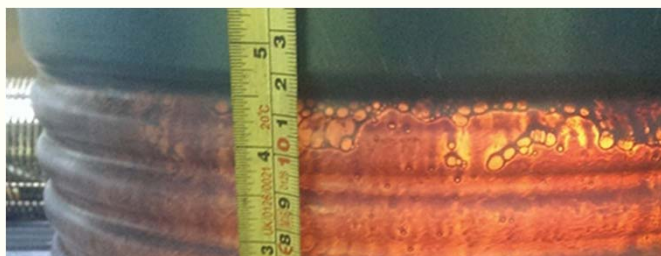
- Composition
- Density
- Age
- Continuity
- Hydrology
- Stability
- Migration?
- Distribution
- Mobility
- Lateral spread
- Vertical spread



NAPL monitoring options and their respective pitfalls

(Jonathan Parry)

- Always a bit tricky
- Visual methods
- Dye shake tests
- PID screening
- Interface probes/baildown tests
- Recovery tests
- Pressure transducers
- Radar probes

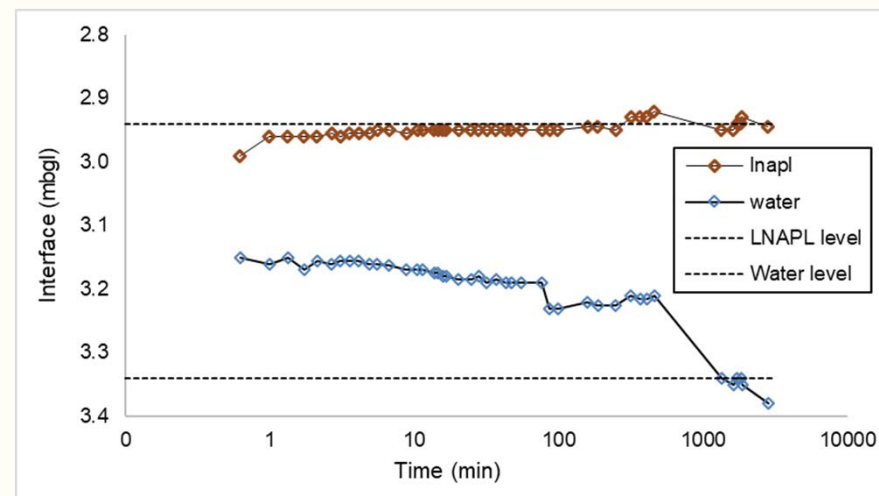
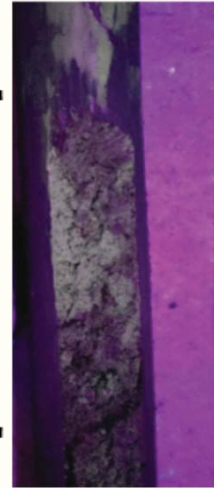


Assessment of baildown tests

(Jonathan Larkin)

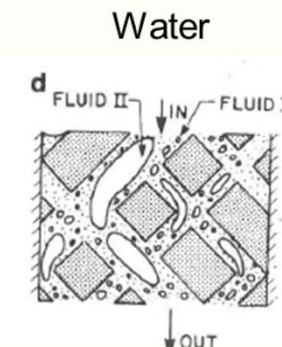
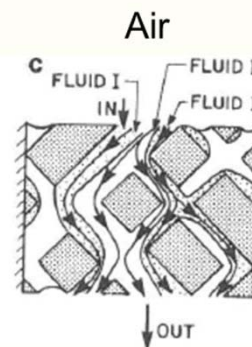
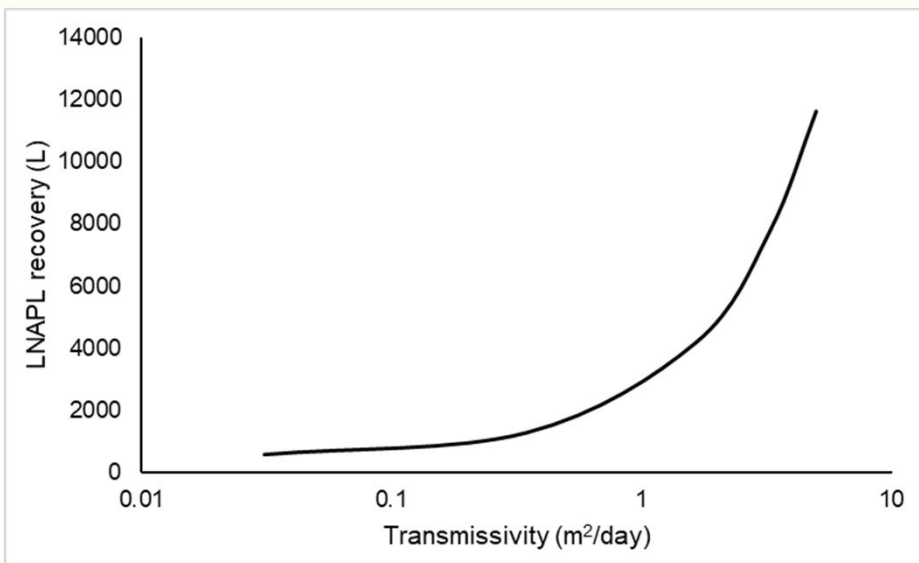
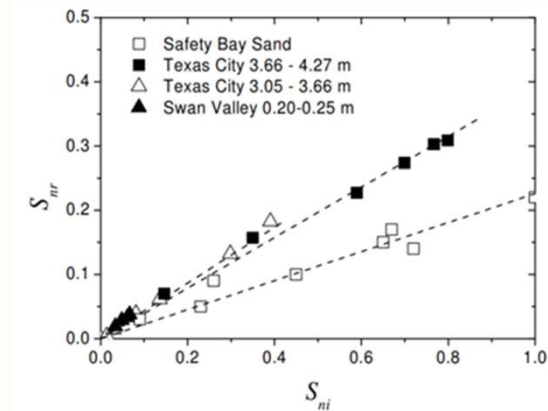
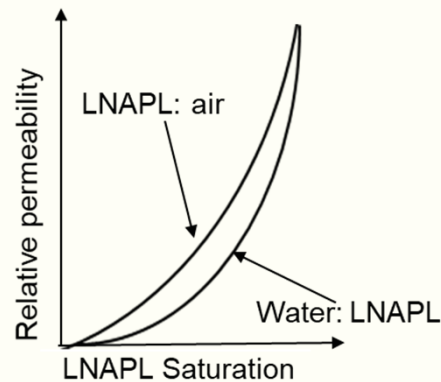
- Provides a direct measurement of the LNAPL mobility. Combined with soil data, saturation and mass can be calculated.
- Conceptually simple, practically less so
- Clear, step-by-step guidance
 - When to do one
 - How to do one
 - How to analyse your data
- What to do when things don't quite go to plan
- Worked examples

Sum of the LNAPL's ability to move



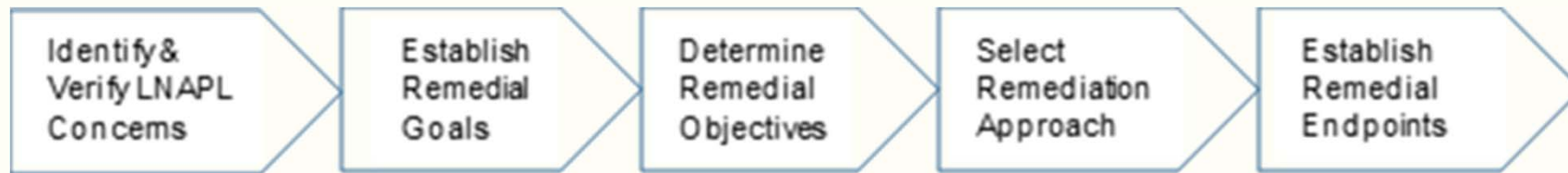
NAPL transmissivity and LNAPL residual saturation (David Holmes)

- What do your data mean?
- How do the data impact risk?
- What is meant by 'residual' in terms of fluid movement?
- What is the NAPL doing?



(Mostly...)

Choosing the right remediation (Anil Waduge)



ITRC LNAPL Site management

As informed by screening tools and data gathering



How will these lower the risk to the wider environment?



Refinement of CSM:
data-led and re-
assessment of risk
with new information

Timescales

- Emphasis on shorter documents
- Endeavour to release first sections early in new year
- Updates issued via SoBRA

Thanks for listening

www.sobra.org.uk