CSLF CO_2 Monitoring Interactive Workshop

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Safety requirements of the EU directive

The EU Directive aims at establishing a legal framework for the environmentally safe storage of CO_2

- Article 4 – Selection of storage sites

  A geological formation shall only be selected as a storage site, if under the proposed conditions of use there is no significant risk of leakage, and if no significant environmental or health risks exist

- Article 7 – Applications for storage permits

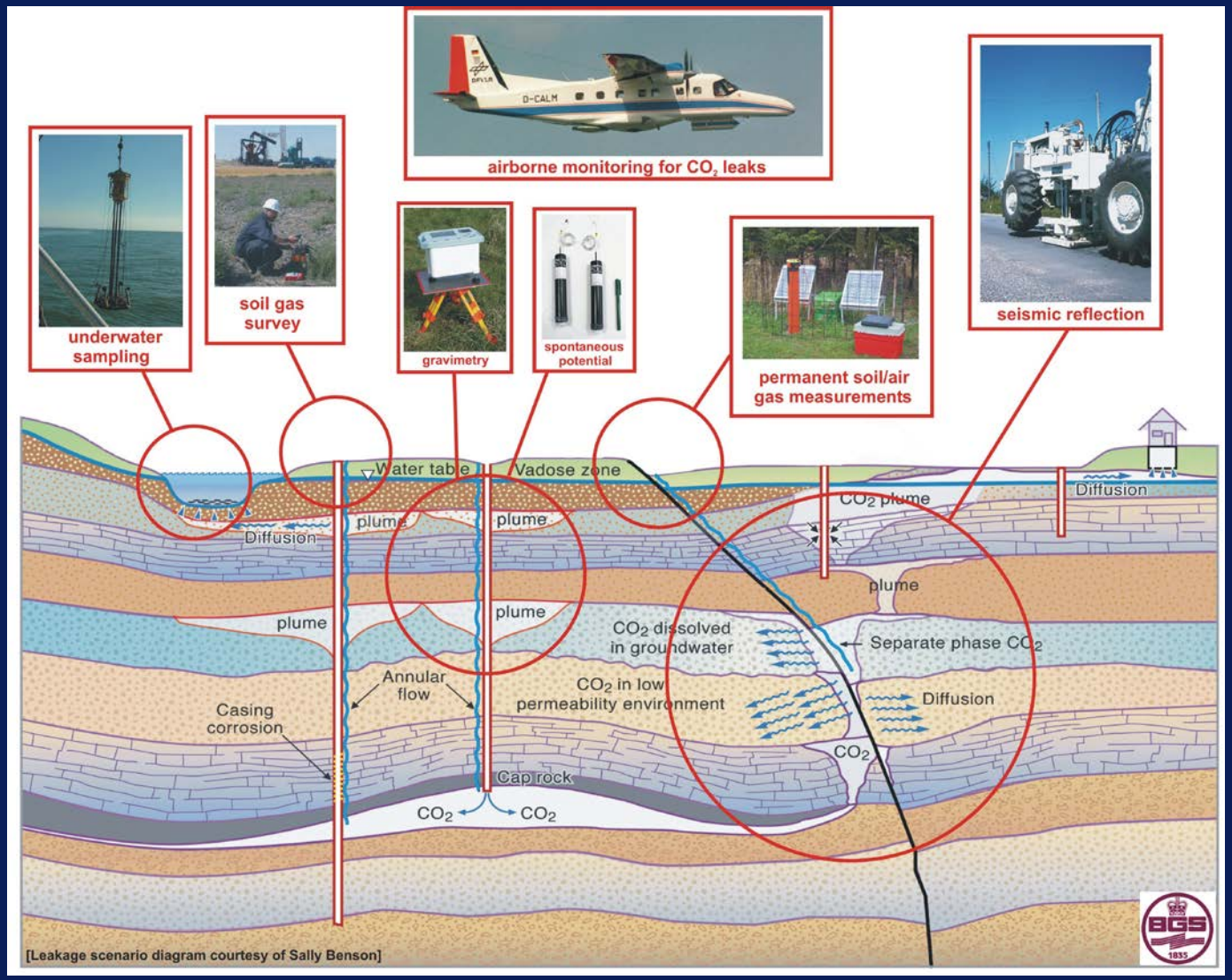
  They shall include:

  - an assessment of the expected security of the storage
  - a description of measures to prevent significant irregularities
  - a proposed monitoring plan
  - a proposed corrective measures plan
  - a proposed provisional post-closure plan

Monitoring of CO_2 storage

- Current site performance
  - ✓ Detecting migration of CO_2
  - ✓ Detecting significant irregularities
- Understanding processes
  - ✓ Process monitoring and calibration
  - ✓ Comparison between the actual and modelled behaviour
- Risk assessment / public confidence in CCS
  - ✓ Detecting leakage of CO_2
  - ✓ Detecting adverse effects for the surrounding environment

Monitoring techniques



- courtesy of CO_2GeoNet -

CO2Tool: results - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.co2captureandstorage.info/co2tool_v2.2.1/co2tool_panel.php

CO_2 Capture and Storage

Monitoring Selection Tool

hide **Control panel** help

Scenario: New Scenario

Reservoir location			
Onshore	Offshore	Both	
✓	✗	✗	

Reservoir depth [m]			
500-1500	1500-2500	2500-4000	>4000
✓	✗	✗	✗

Reservoir type			
Aquifer	Oil	Gas	Coal
✓	✗	✗	✗

Quantity of injected CO_2	
Injection rate [Mt/year]	Duration [years]
0	0

Landuse at proposed storage site				
Populated	Agricultural	Wooded	Arid	Protected
✓	✗	✗	✗	✗

Monitoring phase			
Pre-injection	Injection	Post-injection	Post-closure
✓	✗	✗	✗

Monitoring aims				
Plume	Top-Seal	Migration	Quantification	Efficiency
✗	✗	✗	✗	✗
Calibration	Leakages	Seismicity	Integrity	Confidence
✗	✗	✗	✗	✗

Monitoring package		
Basic	Additional	All
✓	✗	✗

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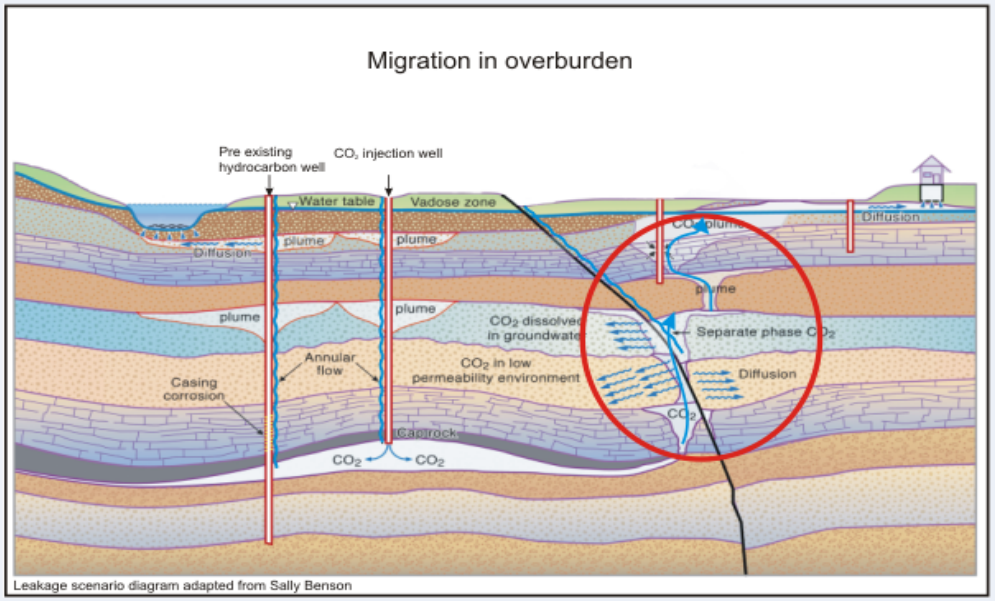
Migration in the overburden (> 25 m depth)



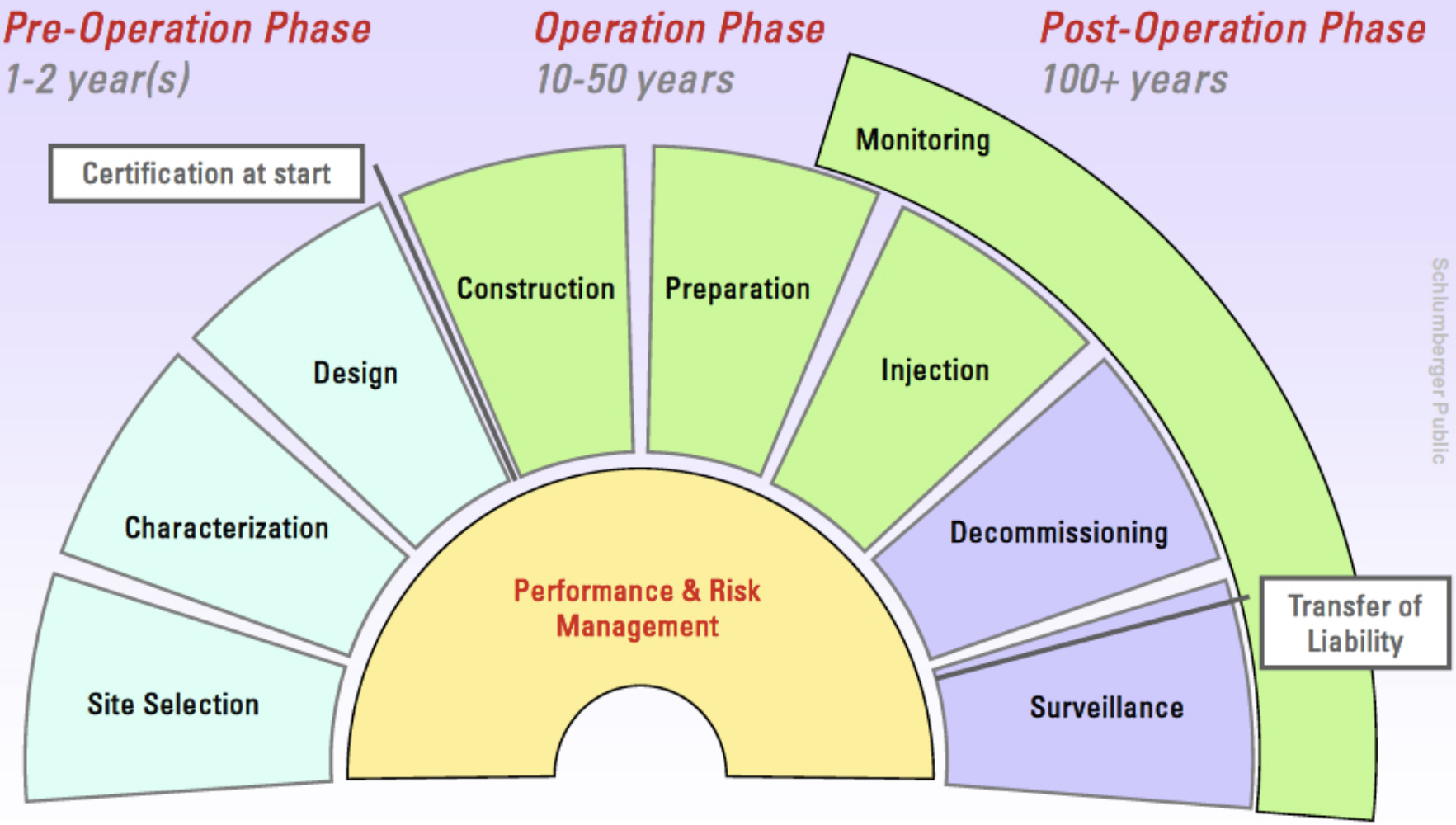
Leakage scenario diagram adapted from Sally Benson

The overburden comprises those rock units lying between the storage reservoir and the land surface (or seabed). The basal overburden unit comprises the reservoir caprock or topseal (for the purpose of the decision tool, monitoring the topmost 25 m or so of the overburden will be considered under surface leakage).

Monitoring in the overburden is likely to be required if CO_2 has migrated from the storage reservoir.

http://www.co2captureandstorage.info/co2tool_v2.2.1/controlbar.php#

http://www.co2captureandstorage.info/co2monitoringtool/



Schlumberger Carbon Services

- courtesy of Schlumberger -

- According the EU Directive …

The competent authority shall review and where necessary update or, as a last resort, withdraw the storage permit:

(a) if it has been notified or made aware of significant irregularities or any leakage …

(d) if it appears necessary on the basis of the latest scientific findings and technological progress

A step change is now vital

- Need now to learn by doing! – demonstration phase engaged worldwide
- Exchange of experiences and knowledge dissemination is necessary
- CSLF has an important role for that