Upcoming NRC Study on Engineered Barriers

Federal Remediation
Technologies Roundtable Meeting
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Focus of the Study

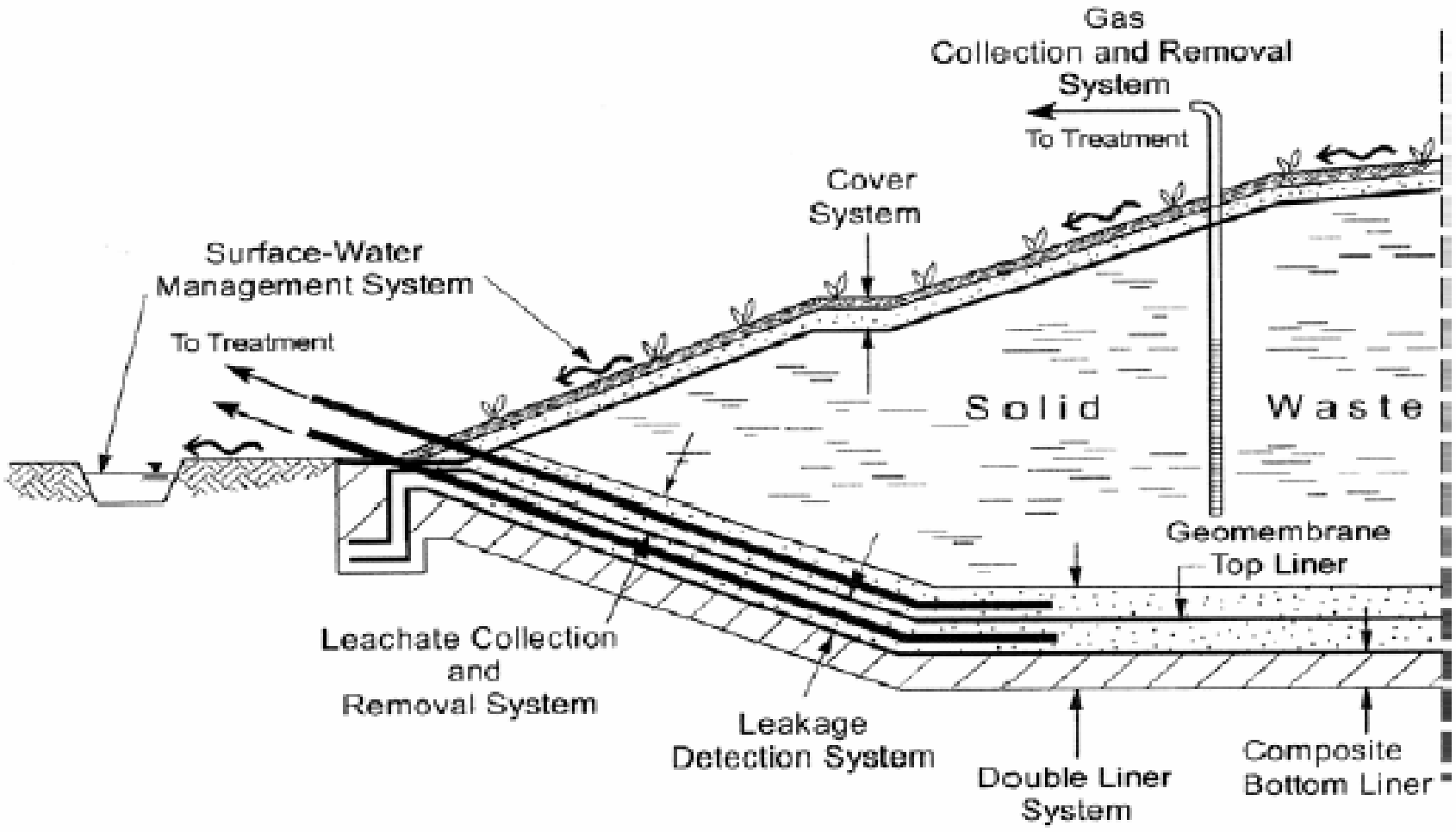
- **Surface and Subsurface Engineered Barriers**
  - **Caps**
  - **Bottom Liners**
  - **Vertical Barriers**
- **Assess the performance**
- **Develop and describe an improved framework (& understanding)**

National Academy of Sciences

National Research Council (NRC)

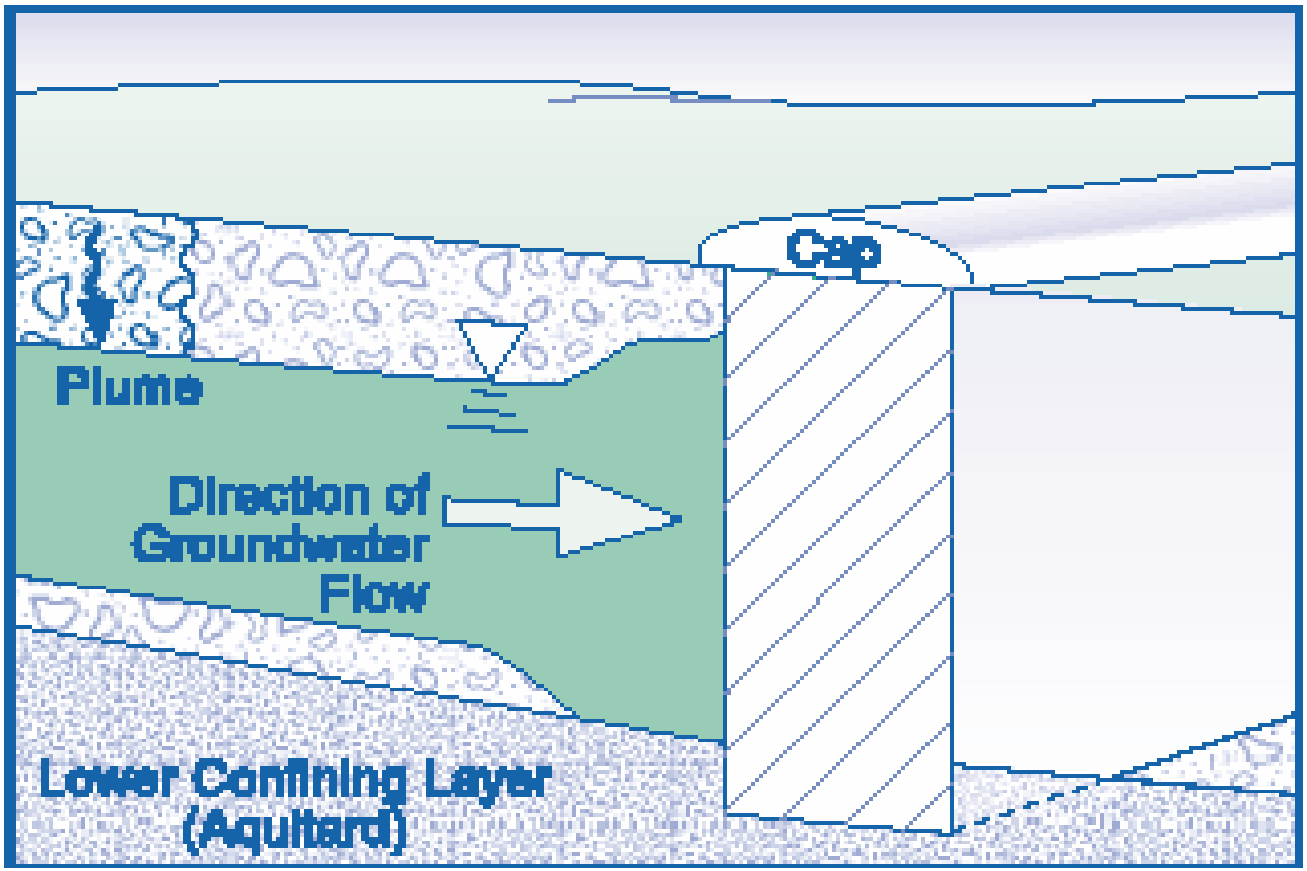
Committee of Geological and Geotechnical Engineering

Typical components of a closed double-lined landfill



Source: Assessment and Recommendations for Improving the Performance of Waste Containment Systems, EPA 2002

Illustration of a Vertical Barrier

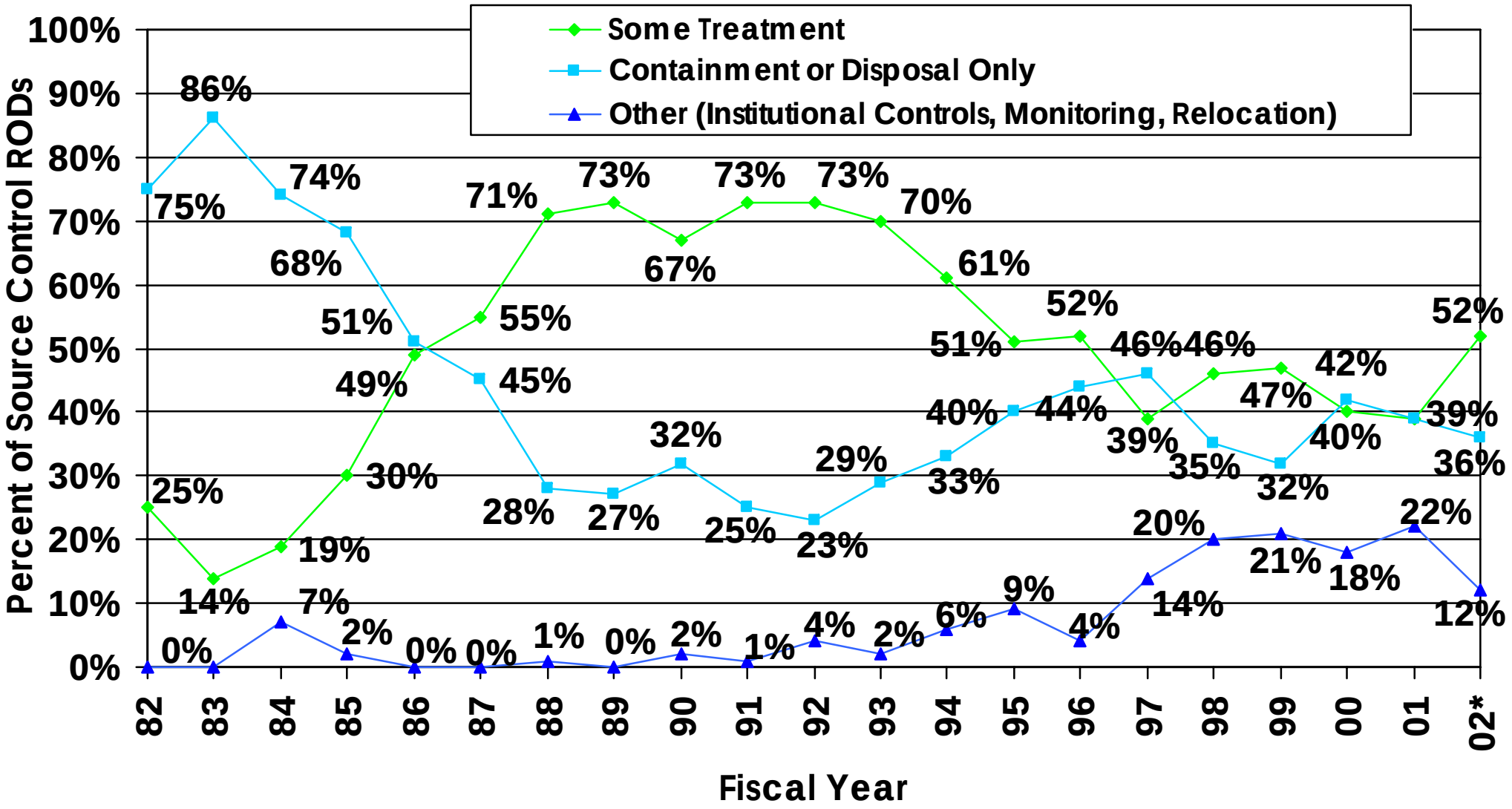


Source: Treatment Technologies for Site Cleanup: Annual Status Report (10th Edition), EPA 2001

Background

- **NRC sponsored a 2-day workshop on Engineered Containment Systems (July 2001)**
  - **Identify key questions that could be addressed in a future study**
  - **Participants included academia, industry, & federal agencies**
- **Draft prospectus: *Assessing the Performance of Surface and Subsurface Engineered Barriers***
- **Sponsors**
  - **Environmental Protection Agency**
  - **Nuclear Regulatory Commission**
  - **National Science Foundation**

Trends in Types of Source Control Record of Decisions (FY 1982 - 2002)*



* Includes information from an estimated 70% of FY 2002 RODs.

Actual Remedy Types at National Priorities List Sites (FY 1982 - 2002)*

Total Number of Sites with a Source Control Remedy = 1,046

Remedy Type	*Number of Sites*
Treatment of a Source	541
Containment or Off-Site Disposal of a Source	576
Other Source Control	650

***Includes information from an estimated 70% of FY 2002 RODs.**
Sites may be included in more than 1 category.

Status of Engineered Barriers*

Technology	Age (yr)	Science Status	Field Performance Characterization
Lining Systems	25	Mature	High level
Capping	25	Evolving	Limited
Cut-Off Walls	45	Evolving	Limited
In Situ Barriers	<10	Immature	Little
Grouting	40	Modest	Little

*Courtesy of Dr. Craig H. Benson, University of Wisconsin-Madison, NRC Engineered Containment Systems Workshop, July 19-20, 2001

EPA's Observations

- **Improvement and innovation has received relatively little attention**
- **Need for technical advances in monitoring and measurement devices**
- **Lack of documented field experiences – case studies**
- **Continual need for long-term performance data**

Specific Task(s) of the Study

- **Describe current and emerging containment systems**
  - **How is their performance defined?**
  - **For how long are they effective, and what factors affect their lifetimes?**
- **Assess current state of science and engineering**
  - **Risk assessment methodology**
  - **System installation**
  - **Performance monitoring**
  - **Sustainability**
- **Identify data gaps and long-term research needs**

Plan of Action

- 21 months from start to finish
- Estimated cost $305K
- Ad hoc committee consisting of experts to be formed
- Kickoff Meeting – Likely Fall 04
  - Solicit expectations from sponsors (& others)
  - Opportunity to revise the statement of task(s)
- NRC point of contact:

  Anne Linn (alinn@nas.edu or 202-334-2744)

Summary

- **NRC study on engineered containment systems is coming**
- **Relevance to many federal agencies**
  - **Encourage participation**
  - **If not $, then provide experience and perspective**
- **Points of contact**
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