Groundwater Remediation in EPA's Superfund Program

Federal Remediation Technologies Roundtable
Arlington, VA
May 14, 2014

David Bartenfelder, PhD
Office of Superfund Remediation and
Technology Innovation

Presentation Topics

- Importance of Groundwater
- Cleanup Expectations
- Technical Impracticability (TI) Waiver
- New Suite of Groundwater Guidance

Importance of Groundwater

- Protection of water, including groundwater, is one of EPA Administrator McCarthy's 7 priorities
- 90% of current Superfund NPL sites include a groundwater remedy
- EPA spends ~$30-50 million/year on the operation of long-term response actions for the first 10 years of restoration actions

Superfund Groundwater Cleanup Expectations

- Define and contain the plume – stop the migration
- Early actions as soon as possible - address the source(s)
- Restore to beneficial use wherever practicable
- Institutional controls should not be the only response
- If restoration not technically practicable – Technical Impracticability (TI) Waiver

Remedial Endpoints

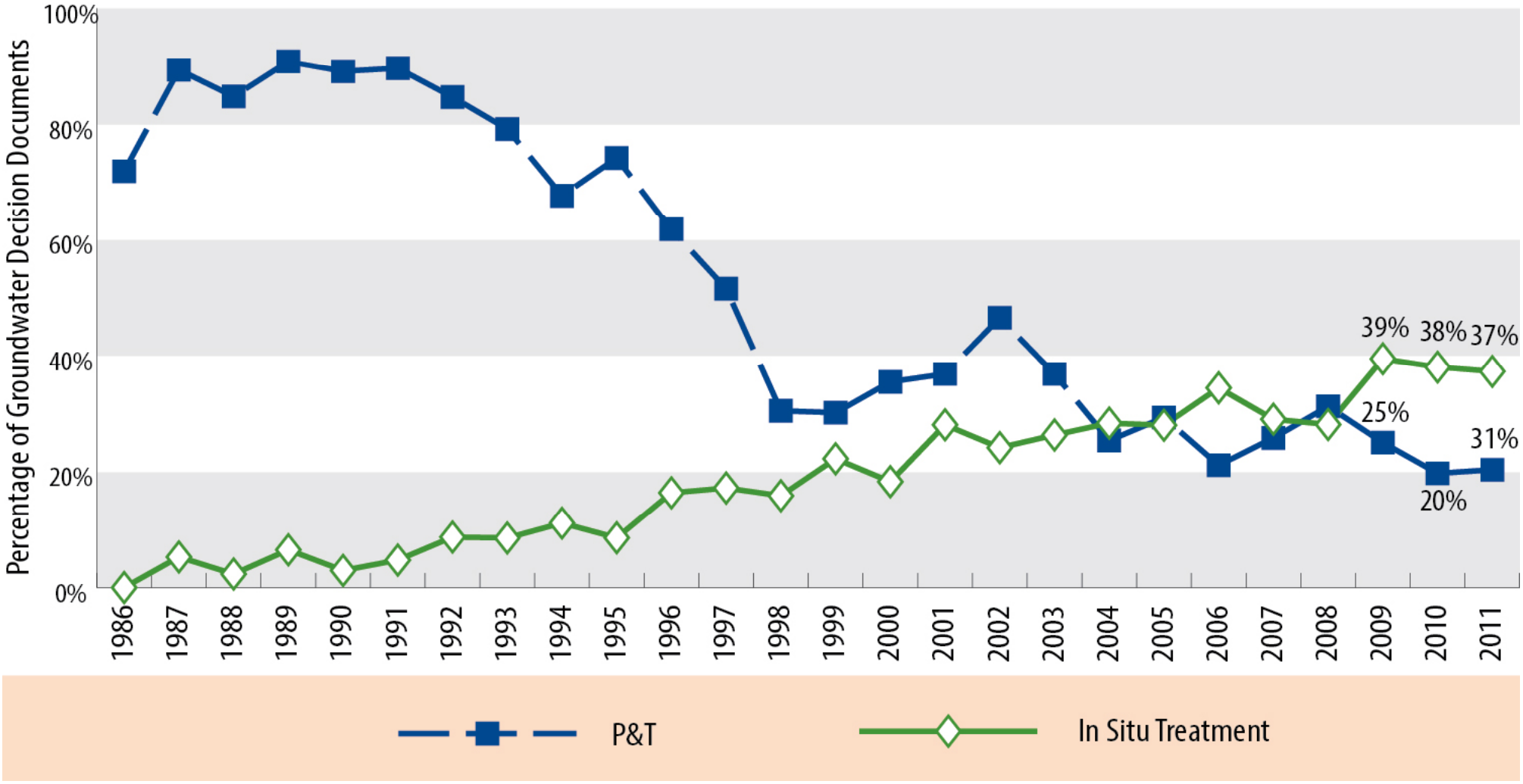
- Restoration
- Non-restoration
  - (TI)

Progress in Groundwater Cleanups

- Over the 3 decades of Superfund cleanups, progress has been made in cleaning up and restoring contaminated groundwater
- Many Superfund groundwater remedies have met remedial action objectives
- Where remedies have not achieved objectives, significant progress has been made to reduce contaminant concentrations
- Technologies and strategies have evolved over time

(Source: EPA, 2013. Superfund Remedy Report, 14th Ed. http://www.epa.gov/superfund/remedytech/srr/)

Selection Trends for Groundwater Pump and Treat and In Situ Remedies (FY 1986 – 2011)



From: EPA Superfund Remedy Report, 14th Edition (Nov. 2013)

Challenges at Groundwater Cleanups

- Making progress on many groundwater remedies but can take decades to complete
- Technical challenges
  - Fractured bedrock
  - Matrix diffusion
  - DNAPL
- Costly to build and operate remediation systems

Alternative Remedial Strategy

- TI just one of six ARAR waivers
- Most TI waivers for GW, but a few for SW
- 100+ TI waivers granted to date
- Waivers based on:
  - Contaminant chemical and physical properties
  - Remedial technology
  - Subsurface geology
  - Time
  - Subordinate cost

Issues at Groundwater Cleanups

- Remedy objectives may not be clearly defined
- Evaluation of progress difficult without interim milestones
- Remedies may have reached technical limitations
- Lack of consensus among site team and/or stakeholders, at some sites

How to address these challenges?

New suite of guidance providing a path to complete sites:

- Focusing resources on making site decisions
- Identifying criteria for determining progress and attainment of remedial action objectives and cleanup levels
- Providing a scientific and defensible basis to make cleanup decisions

New Suite of Groundwater Guidance

- *Groundwater Road Map* (2011)
- *Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions* (Nov. 2013)
  - Recommended Approach for Evaluating Completion of Groundwater Restoration Remedial Actions *(May/June 2014)*
  - Groundwater Statistics Tool *(May/June 2014)*
- *Groundwater Remedy Completion Strategy* (May 2014)

Groundwater Remedy Completion Strategy
(May 2014, OSWER 9200.2-144)

- Helps to focus limited resources toward efficient and effective completion of groundwater remedies
- Recommends including site decision points along the process and encourages site-specific decision making
- Encourages re-evaluation of remedial strategy if not making reasonable progress
- Promotes stakeholder consensus

Groundwater Strategy (cont.)

- **Does <u>not</u>**
  - alter the Agency approach for setting remedial objectives or cleanup levels
  - change existing regulations, guidance or policy including remedy selection
  - address groundwater classifications or groundwater use designations
  - request state/tribes alter existing groundwater classification or use designation

Summary

- **Superfund Program striving to maximize environmental protection**
- **Better define site completion**
  - **Process**
  - **Metrics**
- **Better utilize TI waivers where appropriate**

Contacts

- Anne Dailey (703-347-0373; dailey.anne@epa.gov)
- Kate Garufi (703-603-8827; garufi.katherine@epa.gov)
- Dave Bartenfelder (703-603-9047; bartenfelder.david@epa.gov)