

Electronic Delivery of Analytical Data for US Superfund Cleanups

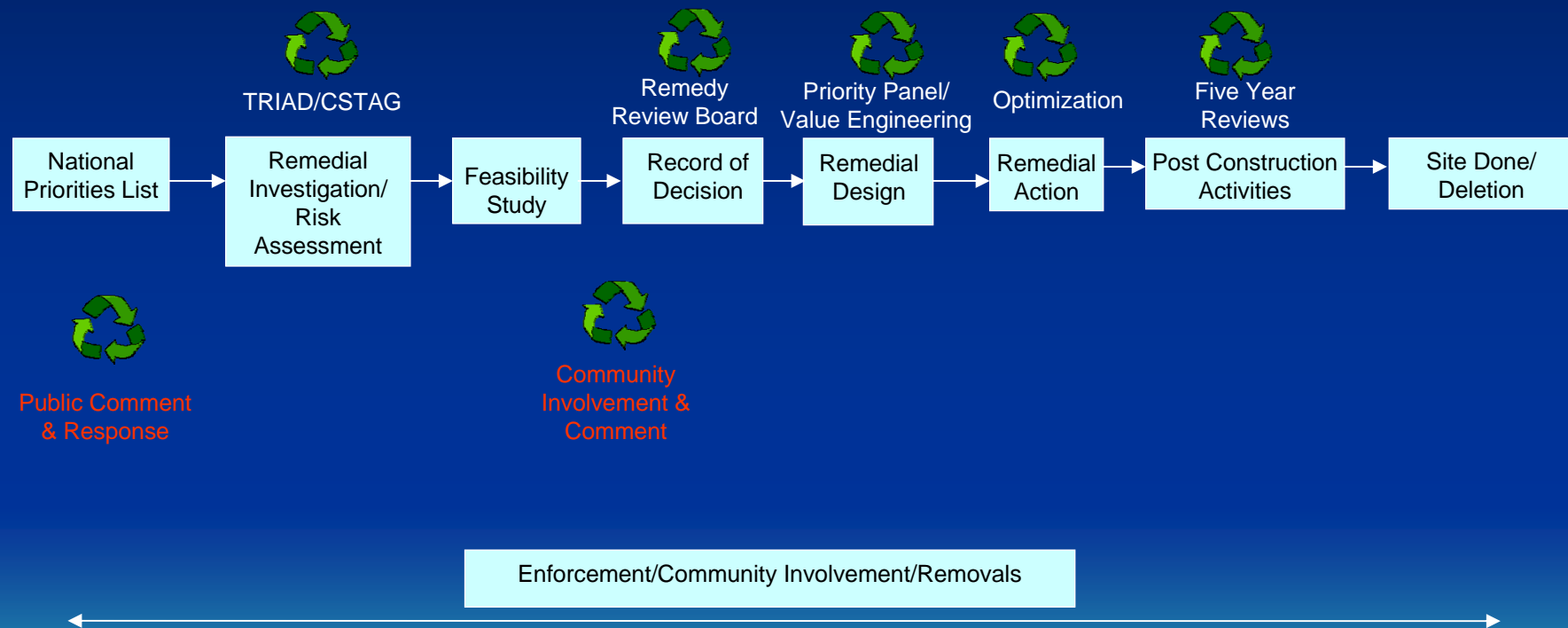
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Innovation

USEPA

Superfund Adaptive Management Process



If waste remains at levels above those recommended for unlimited use and unrestricted exposure, institutional controls and five year reviews will be needed.

Analytical Data Underpin Key Decisions

- Characterize the nature and extent of contamination.
- Assess risks.
- Guide necessary scope of site work.
- Monitor protective conditions.
- Basis for reuse decisions and property values

Federal Agency Need for Data in Electronic Format

- Large Amounts of Data
- Ease of Transmission, Receipt, Evaluation, Storage, Retrieval
- Efficient and Cost-Effective



Problems with Current Electronic Data

- Most data received in proprietary formats (e.g., Word or WordPerfect, spreadsheets in Excel or Lotus).
- The business model for proprietary formats is **PLANNED OBSOLESCENCE** with little or no backward compatibility.
- Thus, most data generated in these formats today will not be accessible 5-10 years from now.

The Need for Open Data Standards

- Ease data exchange between parties.
- Allow vendors to compete on level playing field.
- Prevent individual monopolies that lock a large market share into proprietary formats.
- Evolve to meet future needs.
- Provide incentives for market forces to ensure backward compatibility.



Open Data Standard Examples

- HTML - Hypertext Markup Language
(Used for the Web Pages on the Internet)
- XML - eXtensible Markup Language
(Becoming the Standard for Data Exchange)
- GAML - General Analytical Markup Language



http://www

XML – A Self Defining Data Format

- XML - eXtensible Markup Language.
- Final recommended standard of World Wide Web Consortium.
- Each piece of data is tagged so that the “**electronic data deliverable**” (EDD) is self-defined.



Other Problems

- Labs produce > 300 different EDDs.
- Most EDDs customer-specific.
- Most EDDs proprietary.
- No stand-alone, self-defining EDD, critical for national emergencies.
- No single EDD meets diverse customer needs for detailed analytical chemistry reporting / review.

Staged Electronic Data Deliverable (SEDD)

- An **EDD format** that uses a common syntax to describe diverse laboratory activities and report analytical data electronically.
- Allows users to link analytical data to underlying laboratory activities and processes to provide full traceability.
- Stages allow for diverse reporting requirements, flexibility.
- Lab customer determines level of detail (the SEDD stage) depending on needs.

The Stages of SEDD

- **Stage 1** - Contains minimum number of analytical data elements required to transmit *results-only* data.
- **Stage 2** - Adds method (Stage 2a) and instrument (Stage 2b) *Quality Control (QC) data*.
- **Stage 3** - Adds additional measurement data to allow for independent *recalculation of reported results*.



The Future – SEDD Stage 4

- **Stage 4** file includes *instrument raw data files* generated during the analysis of the sample.



SEDD is Only A Format...

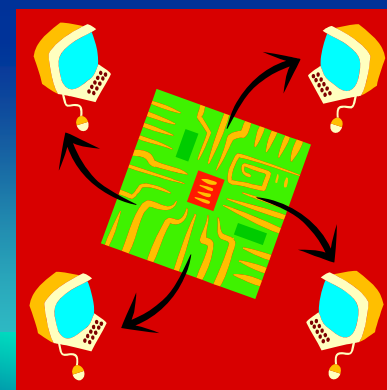
SEDD Is NOT:

- A Database
- A Flat File
- A Parser



What Can SEDD Do For Us?

- Analytical data delivered in XML format (non-proprietary).
- XML is designed for input into various databases.
- Downstream data user options increase.
- Eases data exchange between various parties.



...And Why Is This Important?

- This hierarchal file can be created by a Laboratory Information Management System (database).
- Information can be reviewed and entered into customer databases using automated parsing routines.
- Parsing routines need to be written **ONLY** once for each database type.

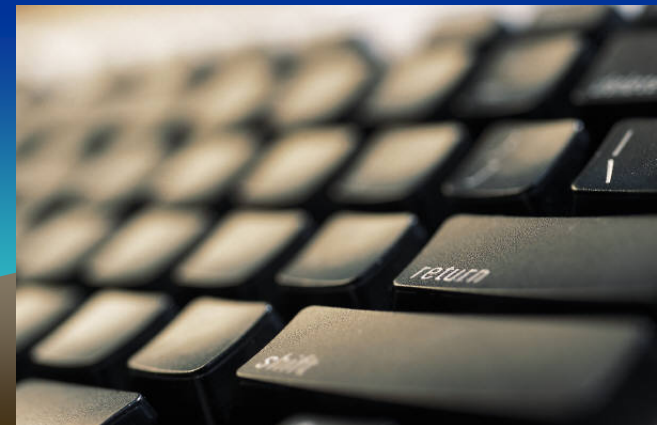
Advantages of Using SEDD

- **For Laboratories** - Reduces the number of EDDs that they support
- **For Data Requesters** – Permits development of common, automated data review tools to check EDDs.
- **For Data Storage** – EDDs stored in non-proprietary format.



SEDD Status

- Ongoing work with laboratories since 2002.
- Labs now delivering SEDD Stage 2 and 3 files.
- SEDD files being input and checked by automated data review software.
- Preliminary results show a 30 to 50% cost savings.

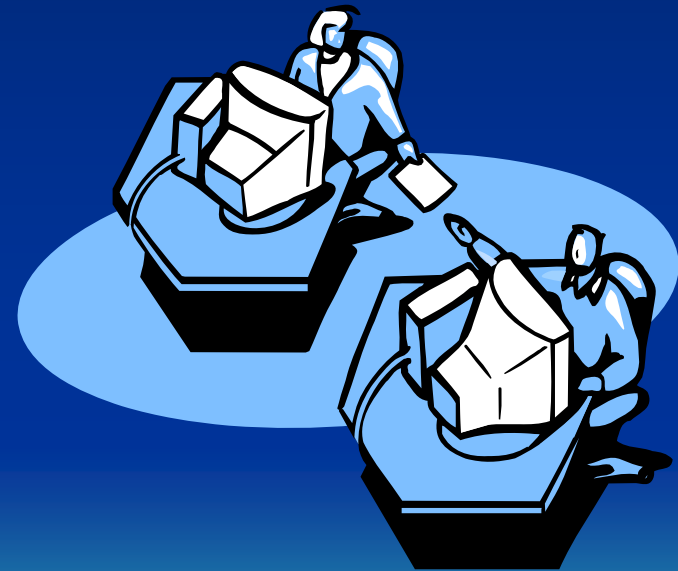


SEDD Implementation

- US Army Corps of Engineers (USACE) Formerly Used Defense Sites (FUDS) Policy Requirement - June 2004.
- All 10 EPA Regions Emergency Response – fall 2005.
- US EPA Contract Laboratory Program (CLP) – ongoing.
- Other Superfund analytical service contracts (RAC, START) – fall 2005.

SEDD Outreach

- US Department of Energy (DOE) sites
- US Navy laboratories
- States
- Private sector labs
- Private industry
(e.g., pharmaceutical, oil)



For More Information...

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 - www.epa.gov/superfund/programs/clp/sedd.htm