Introduction

Overview of Data

One of the stipulations of the Settlement Agreement requires DOE to develop and implement a database that will be available to the public over the Internet on activities managed by DOE. It specifies that the database:

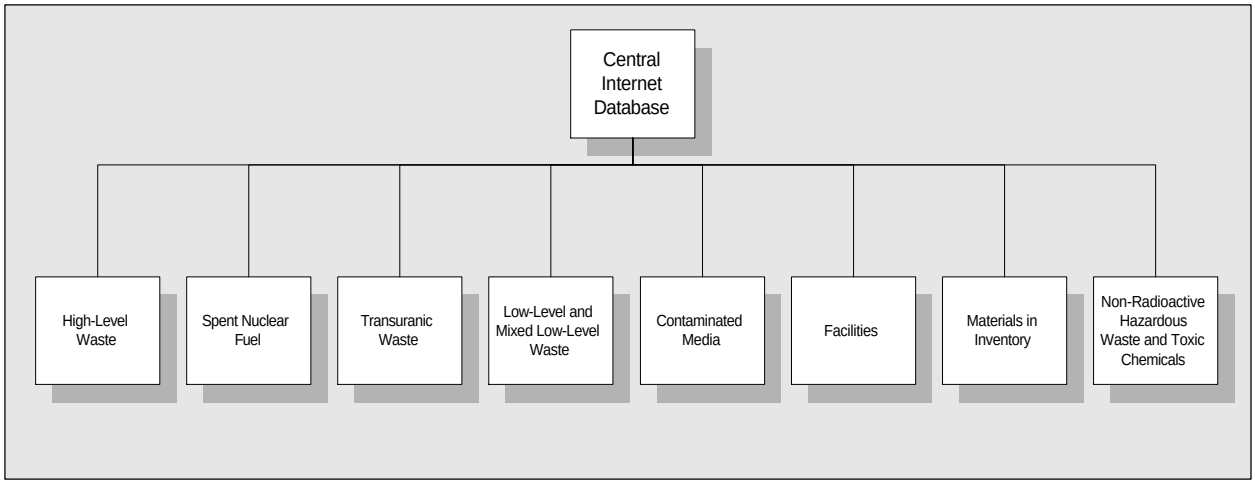
- Include data on DOE-managed contaminated media, contaminated facilities, waste, spent nuclear fuel, and sites governed or managed under the Formerly Utilized Sites Remedial Action Program (FUSRAP), and Section 151(b) of the Nuclear Waste Policy Act (NWPA) which are under the purview of DOE;

- Provide specified information about the data on location and volume or mass of radioactive materials, chemical constituents, radioactivity of materials, DOE generating and managing program, and waste disposition plans and transfers; and

- Provide information from several published DOE reports including the Annual Report of Waste Generation and Pollution Prevention, Annual Toxic Chemical Release Inventory, and Taking Stock: A Look the Opportunities and Challenges Posted by Inventories from the Cold War Era.

This Section provides an overview of the major data categories requested by the Settlement Agreement. Exhibit 1 shows the data categories that will be included in the Central Internet Database.

Exhibit 1. Overview of Data



For most of DOE's waste types (specifically, high-level waste, low-level waste, mixed low-level waste, and transuranic waste), information is captured at a high-level by waste/media streams. A waste/media stream is defined as a group of materials, media, or wastes having similar origins or management requirements (same disposition path).

In addition, a "stream activity" or series of stream activities is associated with each waste or media stream over its life cycle. Examples of stream activities include:

- Generation and storage,
- Treatment,
- In-situ containment,
- On-site disposal, and
- Shipment to another DOE or commercial site.

The series of stream activities that a waste stream undergoes is called its disposition path. The DOE site that is responsible for a particular stream activity is also captured.

The following pages provide detailed information and sample data for each waste type relevant to the Central Internet Database. For those waste types tracked by waste stream, the sample data presents a single disposition path activity for each stream. These are simplified examples to present the nature and extent of data for the waste type. Actual waste stream disposition paths are typically more complex with multiple disposition activities over the stream's life cycle.

Using this data, a variety of reports can be produced. Examples of the types of reports that could be produced include the following:

- Annual volume of waste (by waste type) generated, stored, treated, and disposed;
- Annual intersite waste shipment volumes; and
- Volume of contaminated media contained in-situ at a site.

Section E of this document provides a few examples of the types of reports that could be produced.

High-Level Waste

Data Definition

High-level waste (HLW) is the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation (Draft DOE Order 435.1).

Radioactive wastes that have historically been referred to as high-level waste, i.e., reprocessing wastes, are initially both intensely radioactive and long-lived; however these wastes contain a wide variety of radionuclides with some (e.g., Sr-90, Cs-137) having a relatively short half-life yet representing a large fraction of the radioactivity for the first few centuries after the wastes are produced. These nuclides produce significant amounts of heat and radiation, both of which are of concern when managing such wastes. Other radionuclides, including C-14, Tc-99, I-129, and transuranic nuclides, have very long half-lives and thus constitute the longer-term hazard of the wastes.

Background

Some characteristics of DOE's HLW follow:

- Much of DOE's HLW is stored as liquids, saltcake, or sludge. Most of the untreated liquids, sludges, and other forms of HLW also contain toxic heavy metals or exhibits other hazardous characteristics.

- More than 99 percent of the radioactivity now present in HLW waste is from radionuclides with half-lives of less than 50 years. Longer-lived radionuclides make up the remaining fraction of one percent of the current radioactivity. After several hundred years, the short-lived radionuclides will have decayed and will no longer comprise most of the radioactivity. Hazards attributable to long-lived isotopes in HLW will not change significantly over thousands of years.

- EM manages all of DOE's HLW at the four sites where it was originally generated: Hanford Site, the Idaho National Engineering and Environmental Laboratory (INEEL), the Savannah River Site (SRS), and the West Valley Demonstration Project (WVDP).

- DOE is currently generating, and expects to generate, relatively small quantities of new HLW. In the future, new HLW may continue to be generated from several sources, including the maintenance and eventual deactivation and decommissioning of the chemical separation facilities and processing of some "at risk" nuclear fuel and target elements at the Savannah River Site. However, the quantity of new HLW is expected to be small in comparison to the currently stored inventories. In addition, DOE is seeking to develop alternative technologies capable of stabilizing nuclear materials without generating additional waste.

- Immobilization of some HLW to a form suitable for disposal at a geologic repository has begun at two sites (SRS and WVDP), and a contract to begin design of immobilization facilities at Hanford was executed in 1998.

Source of HLW Data

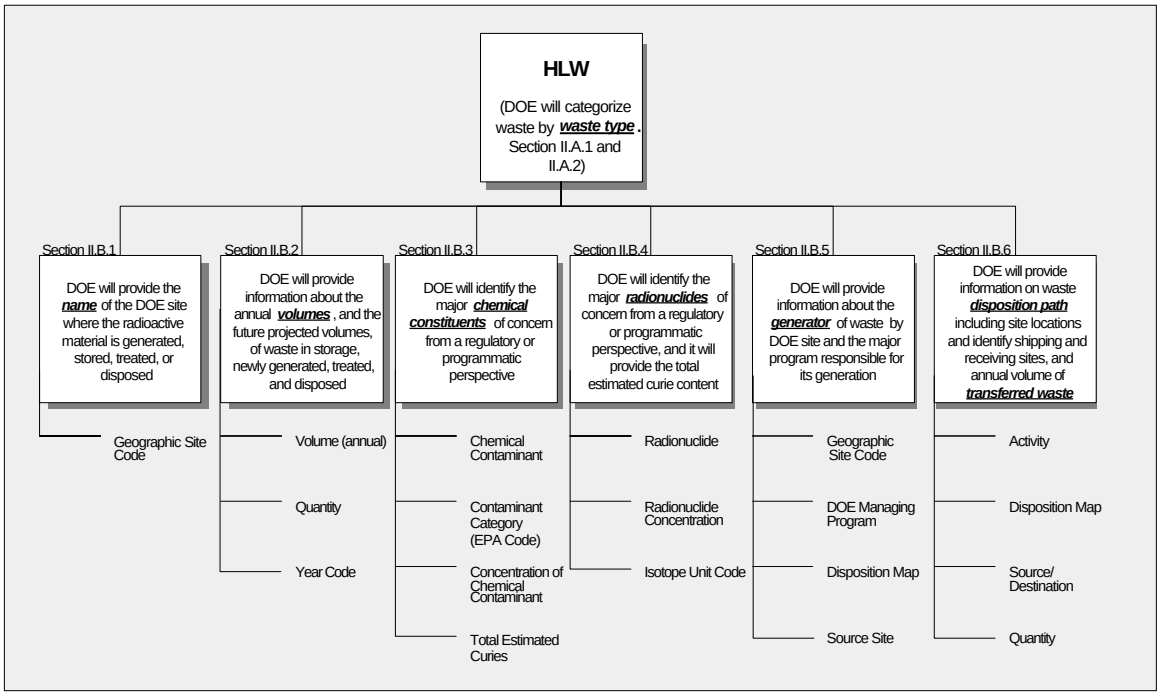
The EM Corporate Database will be the major source for HLW data in the Central Internet Database. HLW information in the EM Corporate Database is tracked by individual waste streams that are inventoried, tracked, and managed individually, or merged with other streams for management purposes (for example, HLW at Richland that will be vitrified is a defined waste stream).

Data collected by the EM Corporate Database currently includes waste type, identity of the waste generator, waste volumes, and information about the disposition path and waste transfers. In addition, data on major waste stream radionuclides and chemical constituents of concern will be collected beginning in the Fall of 1999.

Annual volumes for each disposition path and transfer between sites are captured through the stream activity and annual volume fields. In addition, information is collected on the planned disposition path (i.e., storage, treatment, disposal) of the waste streams and transfer of wastes between sites (i.e., source and destination sites).

Exhibit 1 shows the types of HLW data available to be used in the Central Internet Database.

Exhibit 1. HLW Information Available by Settlement Section

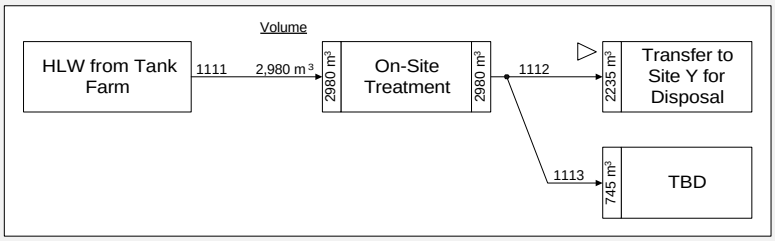


Sample Data

Disposition maps generated by the EM Corporate Database usually depict how waste streams will be managed. A disposition map is a schematic diagram that provides a picture of the scope of a program's environmental restoration and waste management activities. The diagram connects the streams to treatment or disposal facilities in a logical flow diagram from current location to final disposition.

Disposition maps help document the scope, schedule, and cost of the cleanup program at each site. Exhibit 2 and the associated tables show sample disposition map waste streams and representative HLW data based on the specific information requested in the PEIS Settlement Agreement.

Exhibit 2. Sample Waste Stream Data from the EM Corporate Database[1]



Waste Stream ID:	1111	**Waste Stream Name:**	HLW from Tank Farm
Waste Type:	HLW	**Generator Site:**	Site X
Generator Program:	EM (WM)	**Managing Site:**	Site X
Managing Program:	EM (WM)	**Treatment Site:**	Site X
Waste Stream Activity:	On-site Treatment		
Radionuclides of Concern:	Strontium 90 Cesium 137	**Total Estimated Curie Content:**	775,000 curies
Chemical Constituents of Concern:	Lead Chromium		

Annual Volumes[2] in Storage and Treated (m^3)

	1999	2000	2001	2002	2003	2004	2005	2006
Volume of Radioactive Material Treated	44	43	133	130	159	129	270	212
Volume of Radioactive Material in Storage[3]	2936	2893	2760	2601	2472	2343	2073	1861

	2007	2008	2009	2010	2011 - 2015	2016 - 2020	2021 - 2025	2026 - 2030
Volume of Radioactive Material Treated	212	169	169	144	1,166	0	0	0
Volume of Radioactive Material in Storage[3]	1649	1480	1311	1,166	0	0	0	0

[1]The sample waste stream data presented here are a representation of the data collected (or to be collected) by and contained within the EM Corporate database but are not actual EM Corporate database data. [2]Annual and projected data will be reported only for years they are available. [3]Each activity option (e.g., generation, storage, treatment, disposal) would require separate reporting.

Spent Nuclear Fuel

Data Definition

Spent Nuclear Fuel (SNF) is fuel that has been permanently withdrawn from a nuclear reactor following irradiation, but has not been processed to remove its constituent elements (DOE Order 5660.1B, Management of Nuclear Materials, May 26, 1994).

The Fuel in a nuclear reactor consists of fuel assemblies that may range in number from one to several hundred, depending upon the reactor size and the design of the reactor and fuel assembles. Fuel assemblies are constructed in many configurations, but they generally consist of the fuel matrix, cladding and structural hardware.

The fuel matrix contains the fissionable material (typically uranium oxide of uranium metal). The matrix form is typically plates or cylindrical pellets. The cladding is the encapsulation (typically zirconium, aluminum, or stainless steel) that surrounds the fuel, confining and protecting it. Structural parts hold fuel rods or plates in proper configuration and direct coolant flow (typically water) over the fuel. Structural hardware is generally made of nickel alloys, stainless steel, zirconium, or aluminum.

Background

Some characteristics of DOE's SNF follow:

- Spent nuclear fuel contains highly radioactive materials in addition to leftover fissile and nonfissile uranium. Examples of these materials include fission products (e.g., Strontium, Cesium), activation products (e.g., Americium and Curium), and newly created fissile material (e.g., Plutonium 239 and Uranium 233).

- SNF managed by DOE can be generated from a variety of sources, including: production reactors; Naval Nuclear Propulsion Program reactors; research and test reactors; and foreign research reactors.

- DOE constructed and operated production reactors at the Hanford and Savannah River Sites to provide special nuclear material and other isotopes for defense programs. Although these reactors are no longer operational, the Naval reactors and some test and research reactors are still operational.

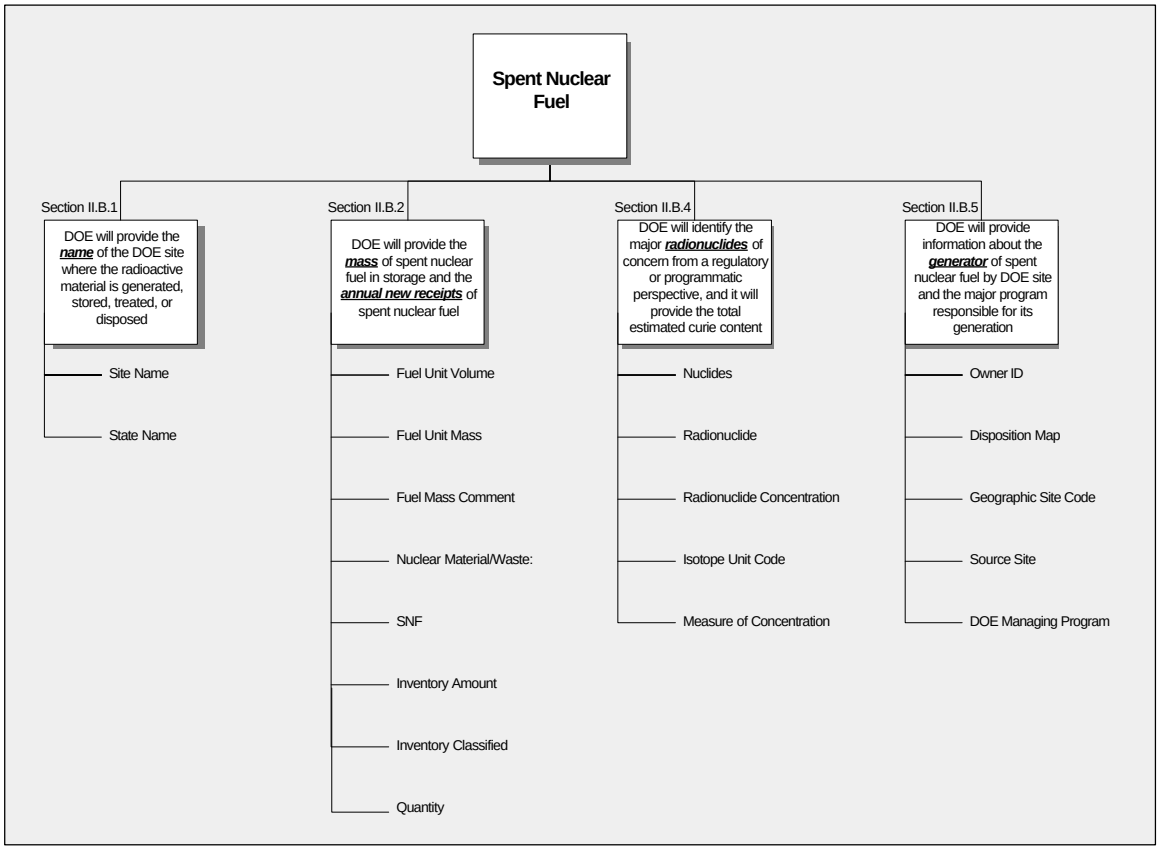
- Historically, DOE has reprocessed SNF to recover fissile material for national defense or research and development programs. Reprocessing was generally terminated in 1992, leaving a backlog of unprocessed fuel and inventory of spent nuclear fuel.

Source of Spent Nuclear Fuel Data

The Spent Fuel Database will be the major source for SNF data in the Central Internet Database. This database tracks SNF by fuel elements, such as fuel, targets, and slugs. A "fuel element" is a fuel unit or group of fuel units that have similar origins and similar dispositions. Each fuel element is assigned a name and is associated with a DOE site where the fuel element is located. The database stores detailed information, based on fuel element, on SNF location, DOE managing (i.e. storing) program, source (generator) of fuel, volume and mass, radionuclide concentration, and storage and disposition information.

Exhibit 1 shows the types of SNF data available for the Central Internet Database.

Exhibit 1. SNF data available for the Central Internet Data



Sample Data

Exhibit 2 and the associated tables show representative SNF data based on the specific information requested in the PEIS Settlement Agreement.

Exhibit 2. Sample Data from the Spent Nuclear Fuel Database

Fuel Element Name:	Al (fabricated by Atomics International)		
Spent Nuclear Material Type:	SNF	**Location of Site:**	Idaho
Irradiating Reactor:	Systems for Nuclear Auxilary Power	**Area:**	Idaho Nuclear Technology and Engineering Center (formerly ICPP)
Owner:	DOE EM	**Facility:**	Fuel Storage Area INTEC-666
Disposition:	Repository Disposal		

Curie Content

	Total Estimated Curie Content	
Radionuclide	**2010**	**2035**
(MTHM)	(.00785)	(.00785)
Ac-277	3.38×10^{-7}	3.38×10^{-7}
Am-243	1.04×10^{-2}	1.04×10^{-2}
Cl-36	9.16×10^{-29}	9.16×10^{-29}
Cm-244	3.63×10^{-01}	3.63×10^{-01}
Co-60	2.67×10^{-01}	2.67×10^{-01}
Cs-137	$2.00 \times 10^{+04}$	$2.00 \times 10^{+04}$
Fe-55	$4.70 \times 10^{+01}$	$4.70 \times 10^{+01}$
Kr-85	$1.99 \times 10^{+03}$	$1.99 \times 10^{+03}$

Annual Volumes[2] (m^3)

	Current	2030
Volume of SNF (m^3)	.02557	.02557
Mass of SNF (kg)	337.600	337.600
Number of Fuel Units	422	422

[1]The sample SNF data presented here are a representation of the data collected (or to be collected) by and contained within the Spent Fuel Database but are not actual Spent Fuel Database data.

Transuranic Waste

Data Definition

As defined in Draft DOE Order 435.1, transuranic waste (TRU) is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years. The term transuranic means those elements with an atomic number greater than that of uranium (i.e., atomic number > 92). This definition of TRU is the definition used in Public Law 102-579, the *Waste Isolation Pilot Plant* (WIPP) *Land Withdrawal Act*, as amended, which authorizes TRU disposal at WIPP. This definition is also equivalent to that of 40 CFR 191, *Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes* issued by the Environmental Protection Agency.

Most TRU exists in solid form (e.g., items such as protective clothing, paper, rags, glass, miscellaneous tools, and equipment that have become contaminated with TRU radionuclides). Some TRU is in the form of sludges or liquids resulting from chemical processing for recovery of plutonium or other TRU elements. Some of the liquids have been solidified, and some sludges have been dewatered. All sludge and liquid wastes scheduled for disposal in the Waste Isolation Pilot Plant (WIPP) will be solidified (before the wastes are shipped) to meet the current WIPP waste acceptance criteria (WAC).

Prior to 1970, waste that meets the current definition of TRU was managed in the same manner as low-level waste (e.g., disposal in shallow burial trenches). Recognizing the need to provide greater isolation of the TRU waste, AEC discontinued shallow land burial of TRU waste and began to segregate, package, and store these wastes for later retrieval ("stored TRU"). The wastes that were disposed of pre-1970 have become known as "buried TRU". The most recent inventory data show that the volume of buried TRU may be significantly greater than stored TRU; however, the curie content -- a better measure of the potential hazard of the waste -- of the stored TRU is much greater than the buried TRU.

Background

Some characteristics of DOE's TRU follow:

- TRU waste exists in many forms and can contain a broad spectrum of hazardous chemical constituents. TRU waste includes aqueous and organic solutions, glass, filters, sludges, salts, resins, incinerator ash, leaded rubber gloves, combustibles, ceramics, low-grade oxides, sand, slag, crucibles, alloys, miscellaneous compounds, scrub alloy, and anode heels. Some TRU waste does include organic and halogenated organic solvents, heavy metals, PCBs, acids, and caustics; however, a large portion of TRU waste does not contain chemically hazardous constituents.

- Cleaning, maintenance, and production processes involving plutonium and other transuranic

radionuclides can generate TRU waste. Environmental restoration, and treatment and handling of HLW and LLW, also generate TRU waste. In the future, deactivation and decommissioning of chemical separations facilities will produce TRU waste.

- The small percentage of DOE's TRU waste that exhibits high direct radiation exposure hazards is considered "remote-handled" TRU waste. The majority of TRU waste emits low levels of direct radiation, and is referred to as "contact-handled" TRU waste. (The handling category of buried TRU was often not documented when buried, but DOE believes that much of that waste is contact handled.) The chief hazard from contact-handled waste is caused by the alpha-emitting TRU elements it contains.

Source of TRU Waste Data

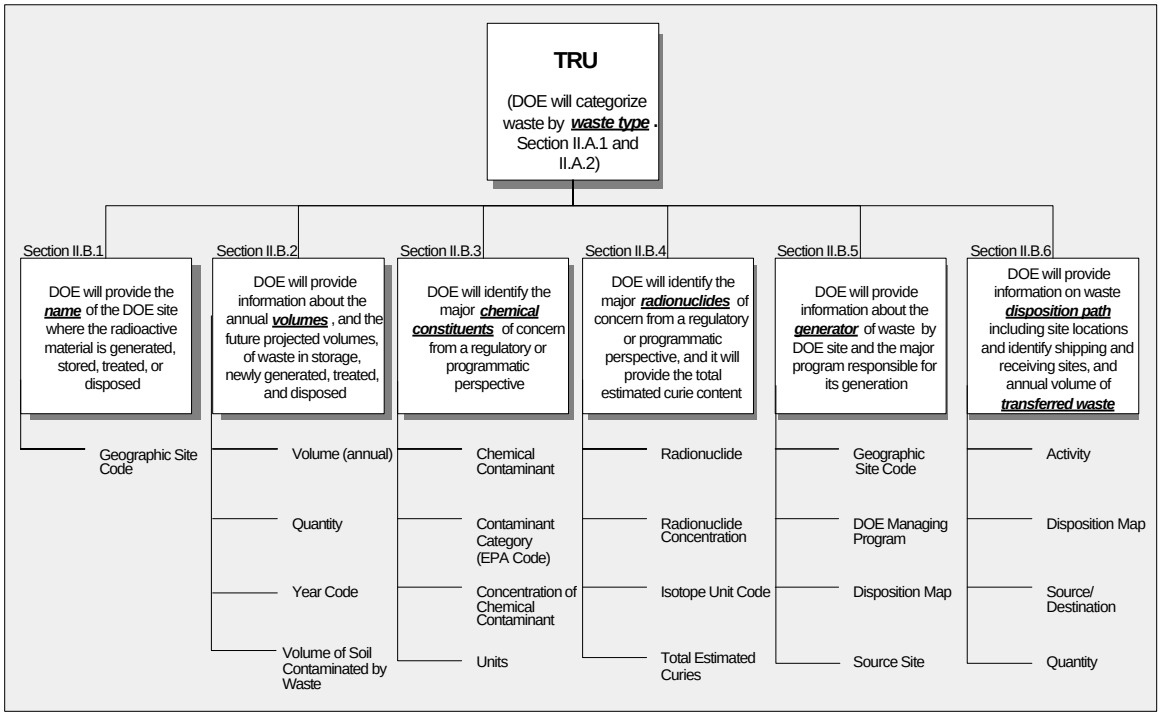
The EM Corporate Database will be the major source for stored TRU data in the Central Internet Database. DOE is currently identifying and analyzing source systems for buried TRU data. TRU information in the EM Corporate Database is tracked by individual waste streams that are inventoried, tracked, and managed individually, or merged with other streams for management purposes (for example, TRU waste at Hanford that will be treated is defined as a TRU waste stream).

Data collected by the EM Corporate Database currently includes waste type, identity of the waste generator, waste volumes, and information about the disposition path and waste transfers. In addition, data on major waste stream radionuclides and chemical constituents of concern will be collected beginning in the Fall of 1999.

Annual volumes for each disposition path and transfer between sites are captured through the stream activity and annual volume fields. In addition, information is collected on the planned disposition path (i.e., storage, treatment, disposal) of the waste streams and transfer of wastes between sites (i.e., source and destination sites).

Exhibit 1 shows the types of TRU data available to be used in the Central Internet Database.

Exhibit 1. TRU Information Available by Settlement Section

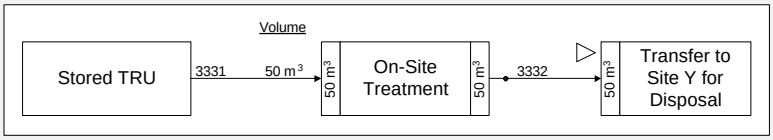


Sample Data

Disposition maps generated by the EM Corporate Database usually depict how waste streams will be managed. A disposition map is a schematic diagram that provides a picture of the scope of a program's environmental restoration and waste management activities. The diagram connects the streams to treatment or disposal facilities in a logical flow diagram from current location to final disposition. In addition, the maps identify uncertainty related to overall scope and disposition. Disposition maps help document the scope and cost of the cleanup program at each site.

Exhibit 2 and the associated tables show sample disposition map waste streams and representative TRU data based on the specific information requested in the PEIS Settlement Agreement.

Exhibit 2. Sample Waste Stream Data from the EM Corporate Database[1]



Waste Stream ID:	3331	**Waste Stream Name:**	Stored TRU Stream #1
Waste Type:	TRU	**Generator Site:**	Site X
Generator Program:	EM (WM)	**Managing Site:**	Site X
Managing Program:	EM (WM)	**Treatment Site:**	Site X
Waste Stream Activity:	Onsite Treatment	**Disposal Site:**	Site Y
Radionuclides of Concern:	Plutonium 238 Plutonium 239	**Total Estimated Curie Content:**	1,250
Chemical Constituents of Concern:	N/A		

Annual Volumes[2] Generated and Treated (m^3)

	1999	2000	2001	2002	2003	2004	2005	2006
Volume of Radioactive Material Treated	0	0	0	20	10	10	10	0
Volume of Radioactive Material in Storage[3]	50	50	50	30	20	10	0	0

	2007	2008	2009	2010	2011 - 2015	2016 - 2020	2021 - 2025	2026 - 2030
Volume of Radioactive Material Treated	0	0	0	0	0	0	0	0
Volume of Radioactive Material in Storage[3]	0	0	0	0	0	0	0	0

[1]The sample waste stream data presented here are a representation of the data collected (or to be collected) by and contained within the EM Corporate database but are not actual EM Corporate database data. [2]Annual and projected data will be reported only for years they are available. [3]Each activity option (e.g., generation, storage, treatment, disposal) would require separate reporting.

Low-Level and Mixed Low-Level Waste

Data Definition

Low-level radioactive waste (LLW) is radioactive waste, including accelerator-produced waste, that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the Atomic Energy Act of 1954), or naturally occurring radioactive material (Draft DOE Order 435.1).[1]

Mixed low-level waste (MLLW) is defined as LLW determined to contain both a hazardous component subject to the Resource Conservation and Recovery Act (RCRA), as amended, and a radioactive component subject to the Atomic Energy Act (Draft DOE Order 435.1).

Background

Some characteristics of DOE's LLW and MLLW follow:

- LLW/MLLW waste can be generated from a broad spectrum of processes and activities including equipment maintenance, materials production, cleaning, environmental restoration, facility deactivation and decommissioning, and the treatment or handling of LLW and other waste types. The largest volume of DOE LLW is managed within the environmental restoration program. There are significant quantities of LLW and MLLW in storage, and additional quantities will be generated in coming years as part of environmental activities and ongoing DOE missions.

- LLW can contain a broad spectrum of radionuclides, including nearly all of those found in high-level waste and TRU waste. Most LLW contains much lower concentrations of radionuclides than HLW and TRU, and thus exhibits far lower direct radiation and inhalation/ ingestion hazards.

- Hazardous constituents present in MLLW include heavy metals, organic and halogenated organic chemicals, cyanides, inorganic chemicals, explosive compounds, and corrosive chemicals and solutions. Some mixed LLW contains both RCRA-regulated hazardous constituents and PCBs regulated under TSCA.

- LLW is present at many DOE sites. DOE disposes of most solid LLW in shallow-land burial facilities. Much LLW is treated prior to disposal to either stabilize the waste form (e.g., by solidifying LLW containing free liquid or particulates) or reduce the disposal volume (e.g, by incineration or compaction).

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[1] 11e(2) wastes are the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material (i.e., uranium or thorium). Although the draft DOE Order 435.1 excludes 11e(2) waste from the LLW definition, its characteristics and management strategies are similar to those for LLW/MLLW. For the purposes of this review, 11e(2) wastes are therefore considered part of this waste type description.

Source of LLW and MLLW Data

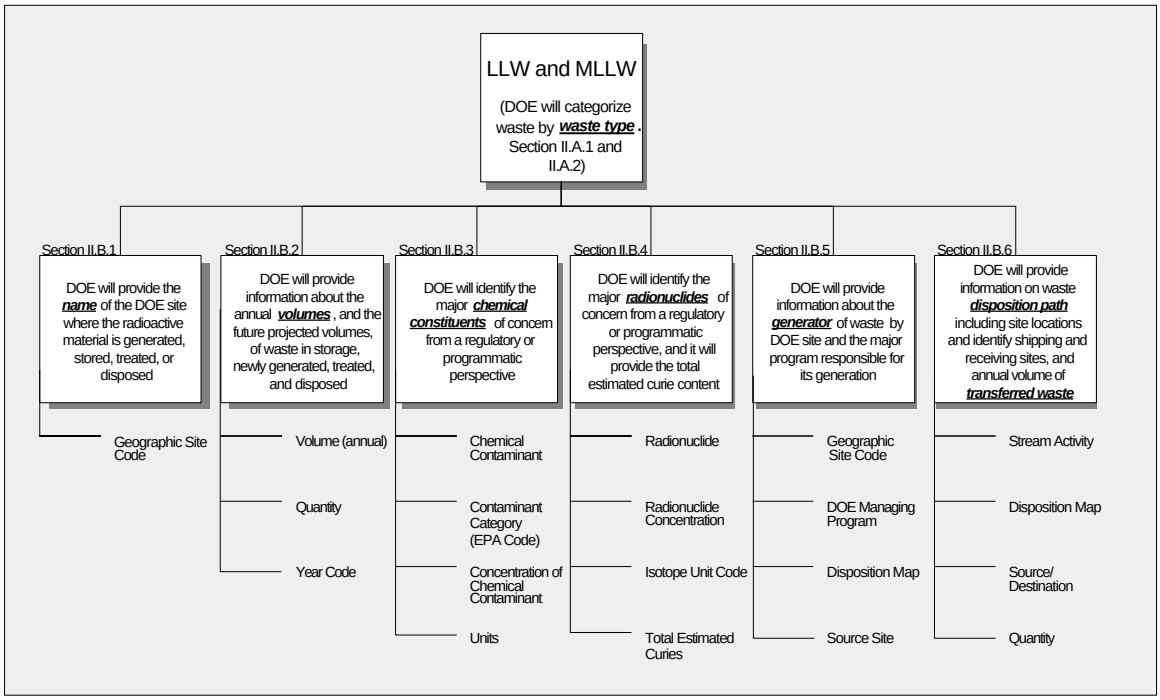
The EM Corporate Database will be the major source for LLW and MLLW data in the Central Internet Database. LLW and MLLW information in the EM Corporate Database is tracked by individual waste streams that are inventoried, tracked, and managed individually, or merged with other streams for management purposes (for example, certain LLW at Oak Ridge Reservation that will be treated through commercial incineration is defined as a waste stream).

Data collected by the EM Corporate Database currently includes waste type, identity of the waste generator, waste volumes, and information about the disposition path and waste transfers. In addition, data on major waste stream radionuclides and chemical constituents of concern will be collected beginning in the Fall of 1999.

Annual volumes for each disposition path and transfer between sites are captured through the stream activity and annual volume fields. In addition, information is collected on the planned disposition path (i.e., storage, treatment, disposal) of the waste streams and transfer of wastes between sites (i.e., source and destination sites).

Exhibit 1 shows the types of LLW and MLLW data available to be used in the Central Internet Database.

Exhibit 1. LLW and MLLW Data Available by Settlement Section

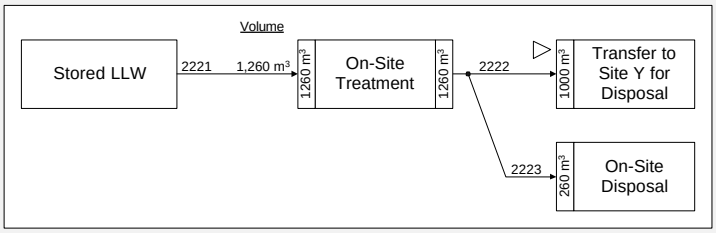


Disposition maps generated by the EM Corporate Database usually depict how waste streams will be managed. A disposition map is a schematic diagram that provides a picture of the scope of a program's environmental restoration and waste management activities. The diagram connects the streams to treatment or disposal facilities in a logical flow diagram from current location to final disposition. In addition, the maps identify uncertainty related to overall scope and disposition. Disposition maps help document the scope, schedule, and cost of the cleanup program at each site.

Sample Data

Exhibit 2 and the associated tables show sample disposition map waste streams and representative LLW and MLLW data based on the specific information requested in the PEIS Settlement Agreement.

Exhibit 2. Sample Waste Stream Data from the EM Corporate Database[1]



Waste Stream ID:	2222	**Waste Stream Name:**	LLW from On-Site Treatment
Waste Type:	LLW	**Generator Site:**	Site X
Generator Program:	EM (WM)	**Managing Site:**	Site X
Managing Program:	EM (WM)	**Disposal Site:**	Site Y
Waste Stream Activity:	Off-Site Disposal		
Radionuclides of Concern:	Cesium 137 Plutonium 238 Plutonium 239 Strontium 90 Thorium 230	**Total Estimated Curie Content:**	3.99
Chemical Constituents of Concern:	None		

Annual Volumes[2] Treated and Disposed (m^3)

	1999	2000	2001	2002	2003	2004	2005	2006
Volume of Radioactive Material Treated[3]	50	50	100	100	200	250	250	200
Volume of Radioactive Material Transferred for Disposal	50	50	100	100	200	250	250	200

	2007	2008	2009	2010	2011 - 2015	2016 - 2020	2021 - 2025	2026 - 2030
Volume of Radioactive Material Treated[3]	60	0	0	0	0	0	0	0
Volume of Radioactive Material Transferred for Disposal	60	0	0	0	0	0	0	0

[1]The sample waste stream data presented here are a representation of the data collected (or to be collected) by and contained within the EM Corporate database but are not actual EM Corporate database data. [2]Annual and projected data will be reported only for years they are available. [3]Each activity option (e.g., generation, storage, treatment, disposal) would require separate reporting.

Contaminated Media

Data Definition

Contaminated environmental media are materials such as soil, sediment, surface water, groundwater, and others (e.g., sludge and rubble/debris that have been disposed of and/or are intermixed with soil) that are contaminated at levels requiring cleanup or further assessment to determine whether an environmental restoration action is warranted.

Activities addressing contaminated media can result in waste generation if an ex-situ environmental restoration activity is performed (other options include no action or an in-situ response, neither of which generate waste). The volumes and types of wastes generated from DOE environmental restoration activities to address contaminated media are a direct result of the remedy chosen. Environmental restoration wastes are often different from those associated with processing operations in that restoration wastes generally have much lower concentrations of radioactive and chemically hazardous substances. Much of the material requiring remediation is a consequence of past activities (e.g., spills, waste disposal, and environmental releases such as liquid discharges to drainage basins). In addition, operations within structures resulted in the contamination of equipment, walls, and floors from routine material-handling activities and from off-normal incidents such as spills and equipment failure. Decommissioning of these facilities will result in wastes being generated such as wipes, concrete, metal, personal protective clothing, and decontamination solvents that generally have low concentrations of radioactive and chemical contaminants.

Background

Some characteristics of DOE's contaminated media follow:

- Contaminated media are primarily water and solids (i.e., soils).

- DOE is now remediating contaminated environmental media through treatment, removal, and containment-oriented actions. Treatment may remove contaminants from the media or immobilize contaminants within it. In some cases, the media themselves are removed from the environment and treated or stored before final disposal. Given current resources, technologies, and priorities, however, the treated media often cannot be returned to the original conditions. If contaminant concentrations and risks are low and regulators concur, DOE may decide not to treat contaminated media. Instead, protection is provided by monitoring contaminant movement and reducing or preventing human exposure through containment or institutional controls.

Source of Contaminated Media Data

The EM Corporate Database will be the source for contaminated media data in the Central Internet Database. Contaminated media information in the EM Corporate Database is tracked by individual

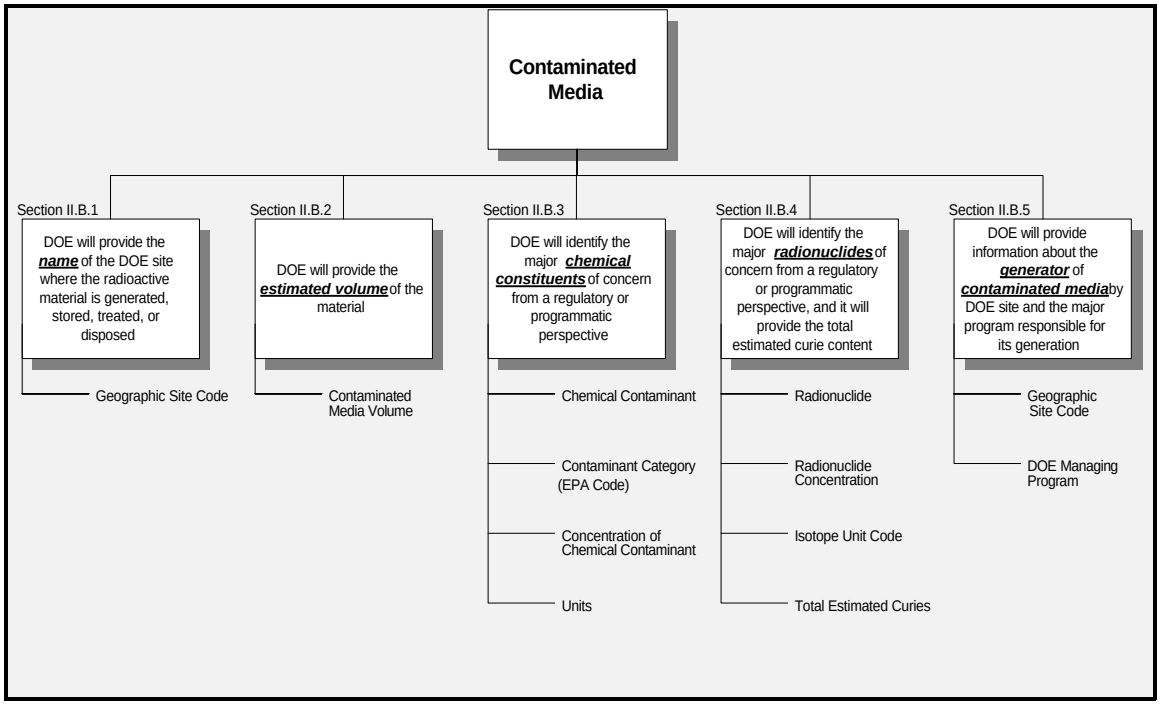
waste streams that are inventoried, tracked, and managed individually, or merged with other streams for management purposes (for example, LLW contaminated soil at Argonne National Lab West that will undergo in-situ phytoremediation treatment is a contaminated media stream).

Data collected by the EM Corporate Database currently includes media type, identity of the generator, media volumes, and information about the disposition path and transfers. In addition, data on major media stream radionuclides and chemical constituents of concern will be collected beginning in the Fall of 1999.

Annual volumes for each disposition path and transfer between sites are captured through the stream activity and annual volume fields. In addition, information is collected on the planned disposition path (i.e., storage, treatment, disposal) of the waste streams and transfer of wastes between sites (i.e., source and destination sites).

Exhibit 1 shows the types of contaminated media data available to be used in the Central Internet Database.

Exhibit 1. Contaminated Media Information Available by Settlement Section



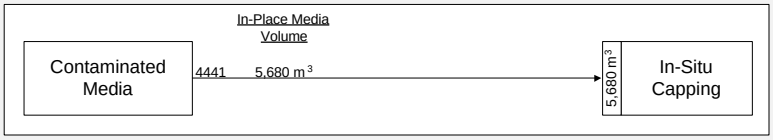
Sample Data

Disposition maps generated by the EM Corporate Database usually depict how waste streams will be managed. A disposition map is a schematic diagram that provides a picture of the scope of a

program's environmental restoration and waste management activities. The diagram connects the streams to treatment or disposal facilities in a logical flow diagram from current location to final disposition. In addition, the maps identify uncertainty related to overall scope and disposition. Disposition maps help document the scope, schedule, and cost of the cleanup program at each site.

Exhibit 2 and the associated tables show sample disposition map waste streams and representative contaminated media data based on the specific information requested in the PEIS Settlement Agreement.

Exhibit 2. Sample Media Stream Data from the EM Corporate Database[1]



Waste Stream ID:	4441	**Waste Stream Name:**	Contaminated Media
Waste Type:	LLW	**Managing Site:**	Site X
Managing Program:	EM (ER)		
Waste Stream Activity:	In-Situ Capping		
Radionuclides of Concern:	Uranium 238 Technetium 99	**Total Estimated Curie Content:**	3.87
Chemical Constituents of Concern:	None		

Volumes	
Volume Dispositioned Under an Approved Regulatory Decision:	0 m^3
Volume Dispositioned Under a Future Regulatory Decision:	5,680 m^3
Total Volume Dispositioned:	5,680 m^3

[1]The sample waste stream data presented here are a representation of the data collected by and contained within the EM Corporate database but are not actual EM Corporate database data.

Facilities

Data Definition

Facilities are defined by DOE's Office of Field Integration (FI) (formerly Office of Field Management) as buildings, land, other structures and facilities (OSF), and trailers/modulars/containers that are owned or leased by the department.

Background

Facilities Information Management System (FIMS) is operated as the DOE's corporate real property database. It contains information on over 20,000 buildings, structures, trailers, and parcels of land. For the purposes of this discussion, FIMS may be characterized in the following way:

- FIMS contains information on approximately 11,600 buildings, 6,000 structures, 4,800 trailers, and 1,000 parcels of land located throughout the country at approximately one hundred sites (excludes power administrations).

- FIMS provides information about facilities including use, construction type, size, and condition.

- Savannah River Plant, Los Alamos National Laboratory, Sandia National Laboratories, Richland, and Oak Ridge National Laboratory contain nearly half of all facilities accounted for in FIMS.

- Twenty-five percent of the Department's facilities were built before 1960, and 50 percent were built before 1974.

- Many of the facilities, such as warehouses, laboratories, nuclear reactors, accelerators, and production/manufacturing buildings, were contaminated through mission related activities and are no longer utilized for Departmental activities.

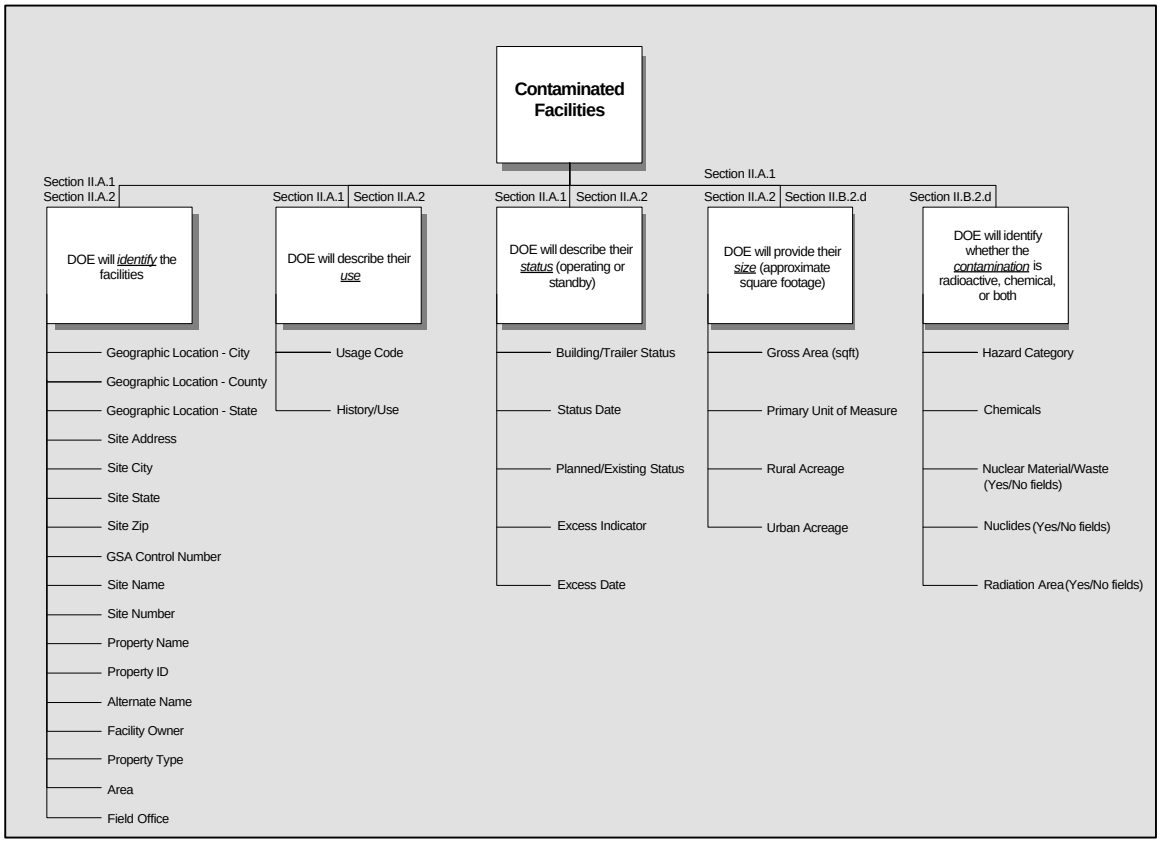
Source of Facilities Data

The FIMS database will be the primary source for this information. The EM Corporate database may supplement the FIMS database with specific information on treatment and disposal facilities. FIMS provides the following data for each facility: site name and location, use, status (operating or standby), size (approximate square footage), and type of contamination (radioactive, chemical or both). The FIMS database tracks a variety of data associated with each facility including its size and/or capacity, condition, use, funding source, hazards, handicapped accessibility, and acquisition and capital adjustment costs. Facility information on the FIMS database is tracked by a "Property ID" (a unique control number assigned to a property). Facility use is designated by a "usage code" field (a code which designates the current use of a property). Status is identified by the "building/trailer status" field (status of the building/trailer reflects

programmatic intentions as well as the physical/operational status of the building). Size of the building is tracked by the "gross area" field (the total area of a building in square feet- exterior wall to exterior wall).

Exhibit 1 shows the types of data available in the FIMS database.

Exhibit 1. Facility Information Available by Settlement Section



Sample Data

Exhibit 2 shows sample FIMS data based upon the specific information requested in the PEIS Settlement Agreement.

Exhibit 2. Sample Facilities Data from the FIMS Database[1]

Property ID:	1234	**Field Office:**	10 Oak Ridge Operations
Property Name:	Building A	**Site:**	03052
Responsible HQ PO:	EM	**Area:**	022
Facility Size (Gross SQ FT):	1600	**Mailing Address:**	123 Facility Drive Any town, TN 87654
Hazard Category:	04 Radiological Facility	**Property Type:**	Building
Excess Indicator/Year:	No	**Building Status:**	Operating

Radiation Designation Areas

Radiation Area:	<50%
High Radiation Area:	0%
Very High Radiation Area:	0%
Contamination Area:	0%
High Contamination Area:	0%
Fixed Contamination Area:	0%
Airborne Contamination Area:	0%

Nuclides

H-3:	N	Sr-90/Y-90:	N
Co-60:	N	U--232/233:	Y
HEU:	N	Thorium:	N
LEU:	Y	Natural/Depleted Uranium:	N
Am-241:	N	Mixed Actinides:	N
Am-243:	N	Mixed Fission/Activation Prod:	N
Pu-238:	N	Mixed Radionuclides:	Y
Pu-239:	N	Other:	N
Cs-134/137:	N		

Nuclear Materials/ Waste Inventory

Transuranic Waste (TRU):	None
Mixed TRU:	None
High-Level Waste (HLW):	None
Low-Level Waste (LLW):	Yes
Mixed LLW:	Yes
Spent Nuclear Fuel:	None
Unirradiated Nuclear Fuel:	None
Source Materials:	None
Radioactive Source/Other Rad Mat:	None

Chemicals

PCBs:	Yes
Friable:	None
Transites as Non-Friable:	None
Mercury:	None
Explosives:	None
Stored Flammable:	None
Other Hazardous Materials:	None

[1]The sample facility data presented here are a representation of the data that may be collected by the FIMS database but are not actual FIMS data.

Materials in Inventory

Data Definition

The Department defines "materials in inventory" as materials that are not currently in use (i.e., have not been used during the last year and are not reasonably expected to be used within the coming year), that have not been designated as waste, and that have not been set aside for national defense purposes. There are 10 categories of MIN studied in the 1997 Report:

Nuclear Material:	Non-Nuclear Material:
Spent Nuclear Fuel	Sodium
Plutonium	Lead
Natural and Enriched Uranium	Chemicals
Depleted Uranium	Weapons Components
Lithium	Scrap Metal

Background

In January 1997, the Department released *Taking Stock: Opportunities and Challenges Posed by Materials in Inventory* reporting on 1996 data. The report was the culmination of a two year initiative that studied the management practices and disposition options in place for materials in inventory. The Department choose the ten categories of material for at least one of the following reasons: they existed in significant quantities, had been the subject of management concerns in the past, and/or no Department program existed to ensure their comprehensive management. Some of the important findings of the MIN initiative are listed below.

- The MIN report identified approximately 820 million kilograms of material in inventory at 44 facilities.

- Significant quantities of lithium, sodium, depleted uranium, weapons components, plutonium, spent nuclear fuel, natural uranium, and enriched uranium existed at only a handful of the 44 sites.

- Significant quantities of lead, chemicals, and scrap metal existed at almost every one of the 44 sites.

- A major focus of *Taking Stock* was materials that did not have a disposition plan. *Taking Stock* represented a "snapshot in time" and a designation that was made (i.e., in-use, MIN, or waste) when the data was collected may not presently be true. There is the potential that disposition plans have since been established and more material has become excess or some material may have been assigned a disposition.

Source of Materials in Inventory Data

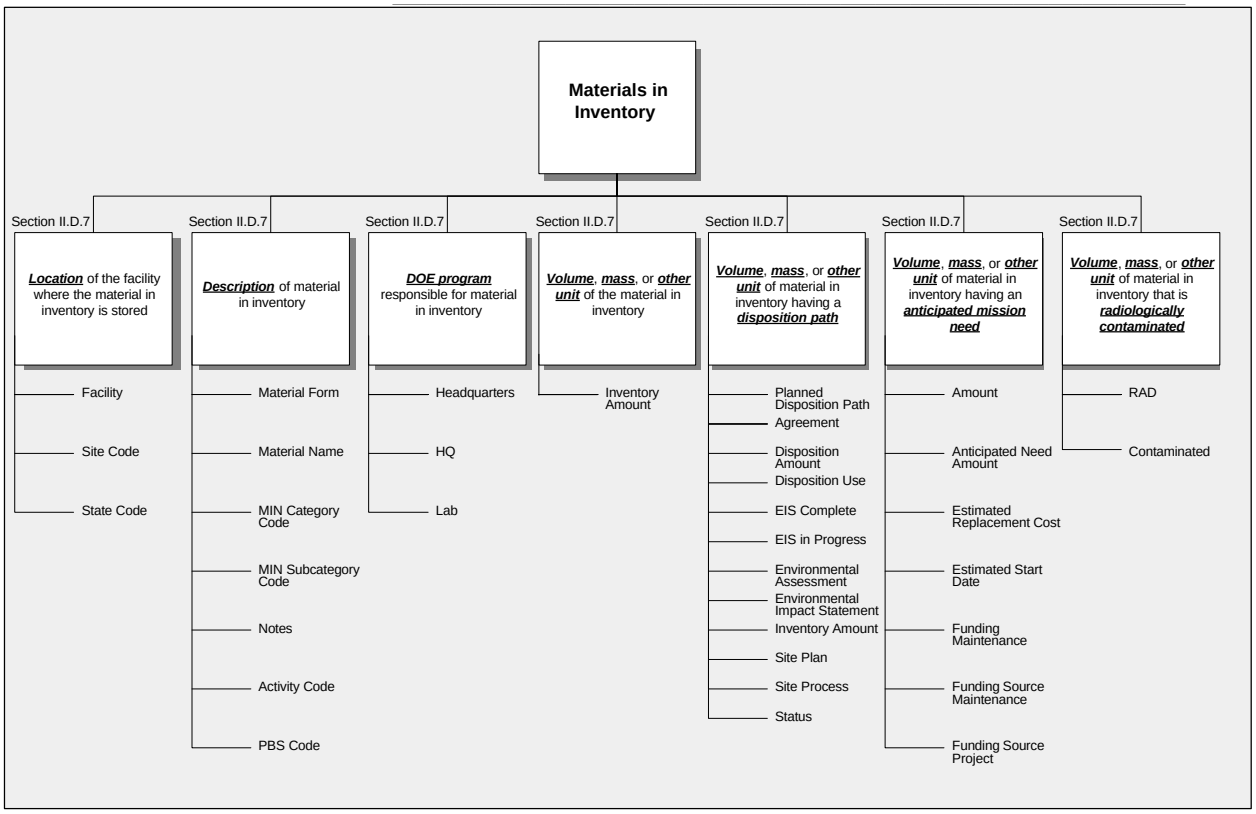
The MIN database is based on *Taking Stock*, and a subsequent data call. The data collected for *Taking Stock* represents a conglomeration of data from 1993 to 1995. There is the potential that much of the information in the database is outdated, and there is currently no plan to update the information contained in the database. This is in line with the requirements of the Settlement, Section II.D.7 :

> As to data in the Database about excess fissile materials and other hazardous or radioactive material inventories, DOE will provide only the data that is contained in the 1996 DOE report entitled Taking Stock: A Look at the Opportunities and Challenges Posed by Inventories from the Cold War Era (Materials in Inventory (MIN) Report). DOE currently has no plans to update this data. In the event that DOE undertakes a national update of any nuclear materials inventories, however, DOE will put any resulting unclassified data in the Central Internet Database.

Also, the classifications used in the MIN database (in-use, MIN, waste) are not legally established definitions. Rather, these classifications were project oriented and are not used by the other data sources that will be included in the Central Internet Database.

Exhibit 1 shows the types of MIN data available to be used in the database.

Exhibit 1. MIN data available by Settlement Section



Sample Data

Exhibit 2 is a sample report from the MIN Database.

Exhibit 2: MIN Amounts by Material Type and Responsible HQ Program

Material Type	Responsibility	Inventory Amount (Units)	
Chemicals	**	11,134.40000	GA
Chemicals	**	5,985,117.00000	LB
Chemicals	EM	15,855.00000	GA
Chemicals	EM	50,000.00000	LB
Chemicals	**	28.00000	CO
Depleted Uranium Hexafluoride	NE	556,501,834.47710	KG
Other Depleted Uranium	ER	48,382.00000	KG
Other Depleted Uranium	NE	1,731,266.35000	KG
Other Depleted Uranium	EM	22,535,085.20000	KG
Other Depleted Uranium	DP	3,469,227.00000	KG
Other Depleted Uranium	**	316,250.81300	KG
Highly Enriched Uranium	DP	5,908.99999	KG
Highly Enriched Uranium	EM	30,106.76999	KG
Highly Enriched Uranium	ER	6.76700	KG
Highly Enriched Uranium	NE	13,891.70700	KG
Highly Enriched Uranium	OT	0.00002	KG
Highly Enriched Uranium	**	1,600.60601	KG
Low Enriched Uranium	**	82,000.05602	KG
Low Enriched Uranium	ER	1,425.40000	KG
Low Enriched Uranium	OT	0.00001	KG
Low Enriched Uranium	NE	1,125,081.16600	KG
Low Enriched Uranium	EM	207,693.40002	KG
Low Enriched Uranium	DP	4,591,884.00004	KG
Low Enriched Uranium	EH	0.50000	KG
Normal Uranium	**	1,269.37200	KG
Normal Uranium	DP	265,900.00000	KG
Normal Uranium	EM	36,915.00002	KG

Non-Radioactive Hazardous Waste and Toxic Chemicals

Data Definition

Non-radioactive hazardous waste is any solid waste or combination of solid wastes, which do not contain radionuclides of any type and, because of its quantity, concentration, or physical, chemical, or infectious characteristics may: (1) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. Under EPA regulations, there are three ways in which a solid waste (i.e., solid, liquid, semi-solid, or contained gas) can be considered hazardous:

1. The waste has to be specifically listed in EPA regulations;
2. The waste is tested and meets one of four characteristics established by the EPA (ignitible, corrosive, reactive, toxic); or
3. The waste is declared hazardous by the generator (the entity producing the waste), based on its knowledge of the waste.

Toxic chemicals refer to those chemicals listed by EPA under Section 313 of the Emergency Planning and Community Right-to-Know Act (also referred to as the Toxic Release Inventory (TRI) List). The current TRI List contains 579 individually listed chemicals and 28 chemical categories (including two delimited categories containing 39 chemicals). EPA has modified the original list of TRI chemicals through petition processes and by EPA initiated actions.

Background

Some characteristics of DOE's non-radioactive hazardous waste and toxic chemicals follow:

- Non-radioactive hazardous waste according to the most recent data:
  - Non-radioactive hazardous waste constituted less than 4% (2,880 cubic meters) of the total waste generated from routine operations across the DOE complex.
  - Non-radioactive hazardous waste constituted less than 3% (12,747 cubic meters) of the total waste generated from cleanup/ stabilization activities across the DOE complex.
  - Three sites contributed nearly 60% of all the non-radioactive hazardous waste generated across the DOE complex: (1) Los Alamos National Laboratory (3,379 cubic meters); (2) Argonne National Laboratory - East (3,046 cubic meters); and (3) Brookhaven National Laboratory (2,902 cubic meters).

- Three Program Offices contributed over 97% of all the non-radioactive hazardous waste generated across the DOE complex: (1) Energy Research (ER) (now the Office of Science) (5,615 cubic meters); (2) Defense Programs (DP) (4,858 cubic meters); and (3) Environmental Management (EM) (4,725 cubic meters).

- Toxic chemicals:

  - DOE sites prepare and submit a self-administered toxic release inventory form, Form R, on each toxic chemical for which the site meets or exceeds the reporting threshold. The DOE Office of Environmental Policy and Assistance (EH-413) receives a copy of the Form R and performs a DOE-wide data analysis. Information contained in DOE's TRI database is taken directly from DOE Form R submissions.

  - For 1996, 19 DOE sites filed a total of 52 TRI forms for 22 listed chemicals. Eighteen sites submitted a total of 50 Form Rs.

  - The 1996 DOE complex-wide total of releases and transfers for treatment and disposal is 733,618 pounds. This is an increase of 147,155 pounds from the 1995 total releases and transfers.

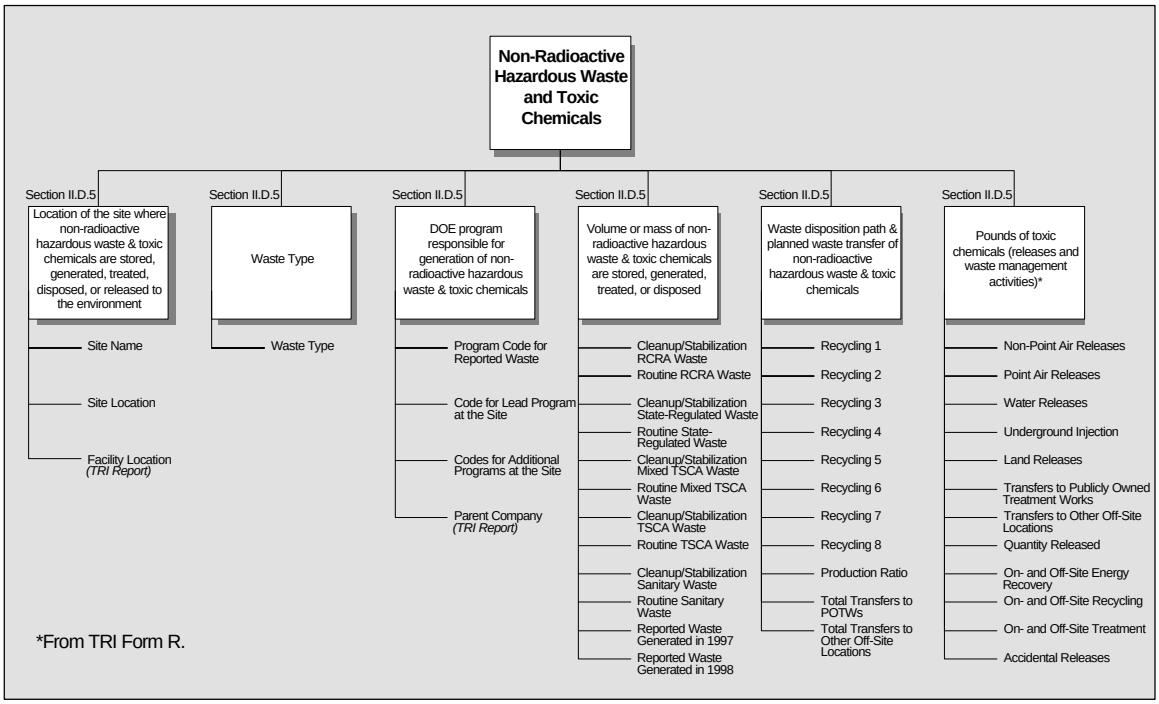
  - The 1996 DOE complex-wide total releases and transfers represents an 84% (3.9 million pounds) reduction in releases and transfers from the 1993 baseline.

Sources of Non-Radioactive Hazardous Waste and Toxic Chemicals Data

Most of the data on non-radioactive hazardous waste and toxic chemicals will come from two sources: the *Annual Report of Waste Generation and Pollution Prevention Progress* (Waste Generation Report) and the *Annual Toxic Chemical Release Inventory* (TRI). The Waste Generation Report is used by DOE managers to assess progress and refine pollution prevention program activities to maximize waste reduction. This report presents DOE complex-wide pollution prevention and accomplishments and profiles waste generation, waste reduction, and recycling efforts at the reporting Operations/Field Offices. It also provides the total volume of hazardous waste generated in that year.

The reporting, pursuant to Section 313 of the Emergency Planning and Community Right-to-Know Act, and DOE's "Right-to-Know Report," provide the public with information about releases and waste management activities, including transfers of toxic chemicals. Exhibit 1 shows the Settlement section and corresponding data fields and sources used to satisfy the requirement (unless otherwise noted, all information is from the Waste Generation Report).

Exhibit 1. Non-Radioactive Hazardous Waste and Toxic Chemicals Data Available by Settlement Section



Sample Data

Exhibit 2 shows sample non-radioactive hazardous and toxic chemicals data based on the specific information requested in the PEIS Settlement Agreement.

Exhibit 2. Sample Data from Waste Generation and TRI Reports

Site/ Program[2]	Waste Generation (metric tons)[1]						1996 TRI Reporting (pounds) (total releases and transfers for treatment and disposal)
	Non-Radioactive Hazardous Waste			Sanitary Waste			
	Routine Operations	Cleanup/ Stabilization	Total	Routine Operations	Cleanup/ Stabilization	Total	
Savannah River Site	57	10	67	2,780	3,295	6,075	23,910
Los Alamos	89	6,999	7,088	2,057	4,073	6,130	730
Defense Programs	841	993	1,834	52,938	21,341	74,279	--
Energy Research	1,510	5,916	7,426	7,510	2,003	9,513	--

[1]The sample data presented here are a representation of the data collected by and contained within the Pollution Prevention database but are not actual Pollution Prevention database data.
[2]Site and program data are reported separately by waste type.