

**WM'00 Conference, February 27 - March 2, 2000, Tucson, AZ**

**WHERE'S DOE'S WASTE AND CONTAMINATION? – TRACKING IT WITH THE CENTRAL INTERNET DATABASE**

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**ABSTRACT**

The U.S. Department of Energy (DOE or the Department) Office of Environmental Management has built the Central Internet Database (CID), which complies with the Settlement Agreement in the lawsuit between *Natural Resources Defense Council et al., v. Richardson*<sup>b</sup>. The CID integrates into one system existing information on Departmental radioactive and non-radioactive waste, contaminated media and facilities, spent nuclear fuel, materials in inventory, and toxic chemicals managed by DOE's Offices of Environmental Management, Defense Programs, Science, and Nuclear Energy. Never before has information from the Department's multiple data sources been integrated under one central database and made available to the public through an on-line (Internet-based) data system. As a result of this effort, DOE anticipates that stakeholders, regulators, Indian tribes, and contractors will gain a more complete understanding of the scope and challenges the Department faces in implementing its environmental management program.

This paper highlights the structure and unique elements of the CID, including its ability to serve as a source of current data on a variety of distinct environmental management activities. This paper also provides an overview of the Database's system capabilities and outlines certain expectations that DOE believes the CID will help fulfill. Specifically, DOE hopes that the Database will: (a) promote better public understanding of the Department and its cleanup programs, (b) allow easier access to DOE's information for both new and experienced database users; and (c) better educate local communities about the Department's environmental management activities and progress, and thereby assist in the public's involvement in DOE decision-making. On January 24, 2000, DOE made available to the general public Version 1.0 - Release 1 of the CID. Additional reports will be added to the Database and available to the general public through two additional releases: Version 1.0 - Release 2 in mid-February and Version 1.0 - Release 3 in late-March, 2000. The CID itself can be accessed through the World Wide Web at <http://cid.em.doe.gov>.

**BACKGROUND**

In June 1989, the Natural Resources Defense Council, Inc. (NRDC) and other organizations filed suit against the Department of Energy (DOE or the Department) over the Department's failure to prepare a Programmatic Environmental Impact Statement (PEIS) regarding its environmental management and weapons modernization activities. In October 1990, a settlement was reached that called for the development of two PEIS's: one covering the nuclear weapons complex's future configuration and the other covering the Environmental Restoration and Waste Management (ER/WM) Program.

In 1995, DOE modified the scope of the ER/WM PEIS to focus on waste management and not on environmental restoration activities. Consequentially, in 1997, the NRDC filed suit against DOE, alleging that DOE had violated the 1990 consent order by failing to prepare a PEIS for the Department's ER/WM Program and that this inaction constituted a contempt of court. On December 14, 1998, DOE and NRDC reconciled the suit through a Settlement Agreement.

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One of the DOE actions specified in the Settlement Agreement was for DOE to develop and deploy a Central Internet Database (CID) with information on radioactive and non-radioactive waste, contaminated media and facilities, spent nuclear fuel, materials in inventory, and toxic chemicals.

Pursuant to the terms of the Settlement Agreement, DOE held on June 3-4, 1999, a national stakeholder forum to discuss plans and expectations for the CID in Columbia, Maryland. More than 100 people from various stakeholder organizations around the nation came to participate in this event. These participants provided input on:

- Data that was contained in the CID;
- Internet linkages to other sources of DOE data;
- Capabilities of the CID, including its design and report-producing capabilities; and
- Ongoing opportunities for continued stakeholder involvement during CID development and testing.

Since this national stakeholder forum, DOE incorporated many of the public's suggestions and hopes that public participation in the CID continues to grow.

### **UNIQUE ELEMENTS OF THE CID**

The CID serves as a unique and valuable tool for the public and stakeholders by providing a greater understanding of the scope and magnitude of the Department's environmental management program. Three features of the CID make it distinctive from other DOE data systems. These features include:

- Provides current, searchable data. Unlike other DOE data presentations that have given data in a form that cannot be manipulated by users (e.g., the many versions of the Integrated Database Report), the CID will allow individuals to obtain the data that they want through easy-to-use report generating features. Because the CID will also be updated regularly, users will be able to maintain better access to up-to-date information on the Department's environmental management activities than has been possible in the past.
- Integrates data from different programs. The information provided in the CID has traditionally been stored in separate data systems, many of which have also been managed individually by the Offices of Environmental Management, Defense Programs, Science, and Nuclear Energy. Information sharing between these offices has often been limited, given their historically different missions and the tradition of "compartmentalization" for security purposes. The CID unifies data from different systems into a single repository and its development has involved staff from all of DOE's affected offices.
- Provides more complete picture of Departmental activities. DOE's environmental activities are a large compendium of programs governed by many different environmental laws. In the past, it has often been a challenge for the public and stakeholders to comprehend fully DOE's broad environmental management programs and responsibilities. By having a single, integrated database, DOE has attempted to break down some traditional barriers to understanding its many different programs. For example, spent nuclear fuel and certain types of radioactive waste are similar in their radiological characteristics and hazards in many respects, but have important regulatory differences and key data about them are stored in different ways. The CID will allow a

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user to obtain all available data about multiple waste, media, and materials from a single data source, offering a more complete picture of the issues DOE is managing at its sites.

### SYSTEM CAPABILITIES

#### Available Data

The CID offers stakeholders, regulators, and the general public access to the most currently available data on the Department's environmental management program at more than 100 sites across the country. These data will be updated regularly over the five-year period, the minimum period for which DOE will maintain the database. DOE will also provide these data in hard copy reports, upon request, to organizations that do not have computer access to the CID. In both Internet and paper-based formats, the CID contains data on the following categories:

- Contaminated environmental media, contaminated facilities, and waste managed by the EM program;
- Contaminated facilities and wastes generated or managed by the Offices of Defense Programs, Science, and Nuclear Energy; and
- DOE-managed domestic, and foreign research reactor spent nuclear fuel (spent fuel from commercial reactors is excluded).

For each of the categories listed above, the CID contains (when the data are available) the location of the site/radioactive material, volume or mass of radioactive material, chemical constituents, radioactivity of materials, generator of waste or contaminated materials, and waste disposition plans and waste transfers. DOE has also included available data in the CID from its 1996 report on ten categories of materials in inventory and recently collected data on buried transuranic waste<sup>c</sup>. For many categories, DOE provides volumes and activities from recent years as well as quantities projected for several years into the future.

The Settlement Agreement also calls for DOE to provide data for the Department's sites governed by Section 151(b) and Section 151(c) of the Nuclear Waste Policy Act (NWPA) and sites managed as part of the Formerly Utilized Sites Remedial Action Program (FUSRAP). Unfortunately, information in national level data systems is very limited for these sites at this time. As a result, data from these sites are not currently available in the CID.

#### Data Sources

The CID does not provide wholly new data, but rather compiles data from existing databases. Six data systems were the source of the centrally-collected, non-classified data that make up the CID, including:

- EM Corporate Database, which provides data on high-level waste, low-level waste, mixed low-level waste, transuranic waste, spent nuclear fuel, and facilities.
- Facilities Information Management System, which provides facility information including contamination status, use status, and size.
- Waste Generation Report (Pollution Prevention Database), which provides information on non-radioactive hazardous waste.

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- Materials in Inventory Database, which provides data on 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.
- Toxic Chemical Release Inventory, which provides information on releases of materials classified as toxic chemicals by the EPA.
- Buried Transuranic Waste Database, which stores information on DOE's buried transuranic waste including volumes, type of burial, radionuclide percentage, and anticipated response actions<sup>d</sup>.

As data from each source are updated, the CID will be modified to reflect these changes.

### Available Functions

DOE designed the CID for a wide variety of users with different database expertise. Specifically, the system allows users to generate three types of reports ranging from a single "ready-to-read" format to potentially complex user-defined formats:

- Ready-to-Read reports, which are "pre-generated" outputs, available in Portable Document Format (PDF), which provide summary data on DOE waste and waste management activities across sites and for the DOE complex as a whole. Figure 1 presents a sample CID ready-to-read report.
- Standard reports, which are pre-defined, pre-formatted outputs that provide detailed information on DOE waste and waste management activities for user-selected states, sites, DOE operations offices, or DOE programs<sup>e</sup>. Figure 2 presents a sample CID standard report.
- User-defined reports, which allow experienced database users to select the content and format of a report from scratch by specifying data sets to be included, identifying columns of data to be included in reports, and applying detailed filters and sorts.

In addition to the above report-types, the CID provides users with links to other DOE web sites with environmental data, as well as an on-line glossary, interactive help, keyword searches, and background information. DOE is also sponsoring a Help Desk, where users can e-mail or call with questions about the CID. These additional CID features are designed to increase the ease and frequency with which new and experienced users find the data they want to learn about the Department and its programs.

### **DESIRED OUTCOMES OF THE CID**

The ultimate value of the CID will depend on its usefulness as an effective data tool to allow users to find quickly the information they want. Although the CID was developed in response to a lawsuit settlement agreement, we believe that the CID will be useful to a wide range of users and for several purposes, including:

- Potentially greater competition for DOE contracts. Bidders for DOE contracts will have easier access to unclassified and nonproprietary information that was previously only



<b>DOE Annual Amounts of Waste in Inventory (Sum-7)</b>												
<b>Waste Type</b>	<b>1999(P)*</b>	<b>2000(P)*</b>	<b>2001(P)*</b>	<b>2002(P)*</b>	<b>2003(P)*</b>	<b>2004(P)*</b>	<b>2005(P)*</b>	<b>2006(P)*</b>	<b>2007(P)*</b>	<b>2008(P)*</b>	<b>2009(P)*</b>	<b>2010(P)*</b>
11e(2) Byproduct Waste	110,637.000	4,440.000	7,160.000	11,180.000	15,200.000	19,220.000	23,240.000	27,260.000	31,280.000	35,300.000	39,320.000	43,340.000
High Level Waste	340,720.660	339,566.780	338,426.660	340,584.560	342,967.160	342,741.060	343,295.960	346,791.860	346,455.760	348,667.660	350,937.660	345,567.760
High Level Waste-Vitrified	977.000	1,182.000	1,387.000	1,587.000	1,787.000	1,987.000	2,187.000	2,387.000	2,523.000	2,669.000	2,795.000	2,933.000
Low Level Waste	250,230.679	285,145.812	217,383.763	177,790.515	169,017.980	135,695.600	122,964.160	115,933.930	119,410.130	121,858.280	129,880.240	134,334.370
Mixed Low Level Waste	63,816.624	41,357.480	34,899.390	27,836.797	24,132.417	21,679.839	20,256.269	18,463.279	12,996.429	8,401.942	4,411.742	3,148.972
Nuclear Materials - Unspecified	1.100	6.100	11.100	16.100	21.100	26.100	31.100	36.100	41.100	46.100	51.100	56.100
Spent Nuclear Fuel	2,475.648	2,469.930	1,689.966	757.206	340.206	332.860	2,422.871	2,404.985	2,400.775	2,397.110	2,394.792	2,392.999
Transuranic Waste	107,436.310	106,811.780	105,060.025	102,617.082	100,478.537	92,935.147	84,247.717	75,880.513	66,956.018	57,522.947	50,449.970	42,093.822

(A)\* = Actual Quantities  
(P)\* = Projected Quantities  
\*\* SNF amounts are reported in metric tons of heavy metal (MTHM)  
\*\*\* For Vitrified HLW, quantities are shown in "Number of HLW Canisters."  
\*\*\*\* Data is rounded to three significant digits to the right of the decimal. Any quantities reported below this level will appear as "zero" on the report.

Figure 1. Sample CID Ready-to-Read Report



**Data Category: Radioactive Waste**

**Management Activity Quantities by Site (RAD-2)**

STATE: Idaho OPERATIONS OFFICE: Idaho Operations Office PROGRAM: Office of Environmental Management													
WASTE TYPE: High Level Waste YEAR RANGE: 1998 - 2070 PHYSICAL FORM: All Physical Forms													
Site	Starting Inventory (m3)*	Addition Quantity (m3)*			Treatment Quantity (m3)*			Disposal Quantity (m3)*			TBD Dispositions (m3)	Other** (m3)	Ending Inventory (m3)
		New	Process Outputs	Receipts	On-Site	Off-Site	TBD-Site	On-Site	Off-Site	TBD-Site			
Idaho	9,785.900	5,140.100	130,495.413	0.000	145,360.213	0.000	0.000	0.000	0.000	0.000	61.200	0.000	0.000
<b>TOTAL</b>		5,140.100	130,495.413	0.000	145,360.213	0.000	0.000	0.000	0.000	0.000	61.200	0.000	

STATE: Idaho OPERATIONS OFFICE: Idaho Operations Office PROGRAM: Office of Environmental Management													
WASTE TYPE: High Level Waste-Vitrified YEAR RANGE: 1998 - 2070 PHYSICAL FORM: All Physical Forms													
Site	Starting Inventory (m3)*	Addition Quantity (m3)*			Treatment Quantity (m3)*			Disposal Quantity (m3)*			TBD Dispositions (m3)	Other** (m3)	Ending Inventory (m3)
		New	Process Outputs	Receipts	On-Site	Off-Site	TBD-Site	On-Site	Off-Site	TBD-Site			
Idaho	0.000	0.000	834.000	0.000	0.000	0.000	0.000	0.000	834.000	0.000	0.000	0.000	0.000
<b>TOTAL</b>		0.000	834.000	0.000	0.000	0.000	0.000	0.000	834.000	0.000	0.000	0.000	

STATE: Idaho OPERATIONS OFFICE: Idaho Operations Office PROGRAM: Office of Environmental Management													
WASTE TYPE: Low Level Waste YEAR RANGE: 1998 - 2070 PHYSICAL FORM: All Physical Forms													
Site	Starting Inventory (m3)*	Addition Quantity (m3)*			Treatment Quantity (m3)*			Disposal Quantity (m3)*			TBD Dispositions (m3)	Other** (m3)	Ending Inventory (m3)
		New	Process Outputs	Receipts	On-Site	Off-Site	TBD-Site	On-Site	Off-Site	TBD-Site			
Idaho	5,998.796	80,224.798	283,854.385	35,136.310	121,299.257	82,179.710	5.310	51,175.361	28,978.410	3.390	0.000	121,372.850	0.000
<b>TOTAL</b>		80,224.798	283,854.385	35,136.310	121,299.257	82,179.710	5.310	51,175.361	28,978.410	3.390	0.000	121,372.850	

Figure 2. Sample CID Standard Report

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available readily to incumbent contractors. Consequently, the CID could help encourage broader competition, which benefit the taxpayers by increasing competition, and potentially reducing costs.

- Improved communication between DOE and stakeholders. The CID will, for the first time, provide a wide range of information, interactively in a publicly available manner. The CID will provide more comprehensive information than has ever been available on DOE waste and contamination. The Department's experience is that interactions with stakeholders who monitor DOE activities is more constructive when more timely and complete information is available. Consequently, we expect the CID to result in more constructive interactions and a reduced potential for miscommunication.
- Expand public understanding of DOE activities. The database contains several features to assist beginning and experienced users in obtaining the information they need with minimal effort. The Department's activities are inevitably complex, and previously, largely secret. Consequently, only a relatively small subset of the general public has been knowledgeable about DOE activities, because of high threshold for gaining the necessary understanding. The CID should help reduce that threshold by making the information more readily available.
- Continued public input. At least one year after the CID becomes operational, the Department will hold a second national stakeholder forum to demonstrate the operation of the Database, including its structure and linkages to other databases. This forum will be an excellent opportunity for the public to provide their input on the usefulness of the CID. Furthermore, at the second forum, the public will be able to suggest additional website additions and enhancements. Upon request, DOE will also sponsor a third forum to consider the issue of whether DOE will maintain and operate the CID beyond the required five-year period.

## CONCLUSIONS

Developing the CID has been both a technical and institutional challenge. However, the challenges have been successfully met by the cooperation of many DOE employees, contractors, and the useful involvement of stakeholders. The CID is expected to evolve as DOE learns more lessons from this effort to compile information from a wide range of data sources into a single relatively comprehensive and interactive database. We expect that as it is used by stakeholders, regulators, Indian tribes and DOE contractors, areas for improvement will be identified. Moreover, the benefit of viewing information in this comprehensive manner will become apparent.

## FOOTNOTES

<sup>a</sup> Contract support from Project Performance Corporation (PPC), Booz, Allen, and Hamilton (BAH), and MACTEC. Key PPC staff includes: Craig Cheney, Pam Cole, Kevin Ryan, Rena Levine, Jason Erdman, and Stephen Higgs. Key BAH staff includes: Mark Handelman, Tim Erny, Kris Sebesta, Susan Tremble, Bob Caverly, and Mark English. Key MACTEC staff includes: Dave Meredith, and Tim Kirkpatrick.

<sup>b</sup> Natural Resources Defense Council et al., v. Richardson, Civ. No. 97-9369 (SS) and *Federal Register*, Volume 64, Number 77, April 22, 1999, p. 19753.

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<sup>c</sup> The CID only includes data that are available and currently collected by DOE on a national level, or that are already planned to be collected in the future by DOE on a national level. The CID does not include any information that is classified, controlled, or proprietary. Because the CID contains these data on all of DOE's major programs, it represents the first central Departmental source for storing, managing, and accessing such information.

<sup>d</sup> These data were included in response to a 1997 report by the Institute for Energy and Environmental Research, entitled *Containing the Cold War Mess: Restructuring the Environmental Management Program of the U.S. Nuclear Weapons Complex*.

<sup>e</sup> When generating standard reports, the user can tailor the output of a query by selecting desired categories of information through "selection criteria" screens. This process allows a report to include or exclude particular sites, waste types, years, and other types of information from the report format based on the topic or area of interest to the user. The CID's standard reports display annual and projected waste/material volumes, waste/material characteristics data, shipping and receiving information, and treatment, storage, and disposal systems information.



## APPENDIX A. USERS' GUIDE TO THE CENTRAL INTERNET DATABASE

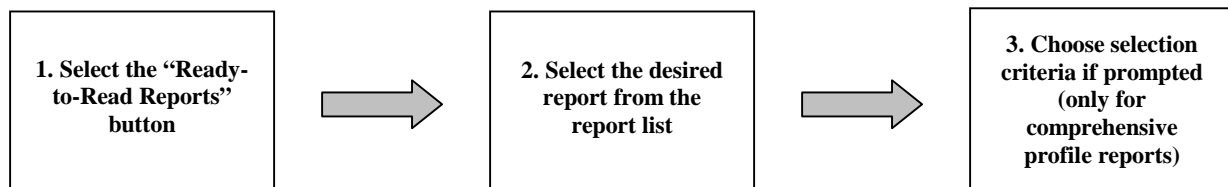
The CID can be accessed through the World Wide Web at <http://cid.em.doe.gov>.

### Features of the CID Home Page

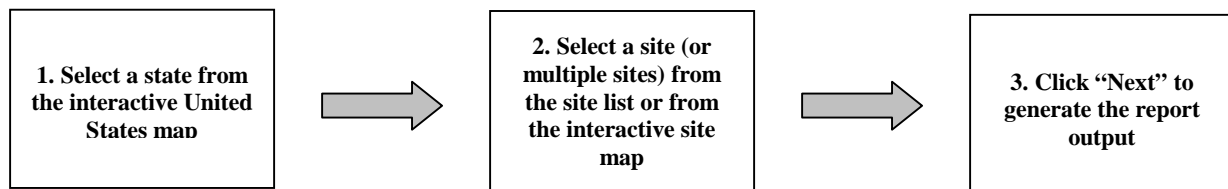
The CID is designed to give users easy and efficient access to large amounts of information collected by DOE for its nuclear waste management and cleanup program. This appendix provides an overview of the features of the database and highlights the necessary steps to access information from the CID. The CID features include:

- United States Map. The U.S. map enables users to select a state and a DOE site to generate a *Site Profile* report. The *Site Profile* report provides an overview of waste, media, and facilities information for the selected DOE site.
- Side Bar Menu - Throughout the CID, there is a side bar that provides direct access to key features of the web site. The side bar buttons are titled: "What's New"; "Overview"; "Related Links"; "Getting Started"; "Web Site Map"; "Contacts"; "Feedback"; and "Generating a Report".
- Features Menu - Throughout the CID, there is a features menu bar at the top of the screen. This bar provides direct access to CID reference pages and to the CID home page from any page in the web site.
- Search Tool - The keyword search feature enables users to input one or more words to search quickly through the entire CID, the glossary, the data dictionary, report titles, and the site list.
- Dictionary - The data dictionary lists the definitions for each piece of data (i.e., data element) in the CID.
- Glossary - The CID uses many technical terms that are either commonly used by DOE or are part of standard system/development language. The glossary defines these terms and acronyms. When these terms are used in the web site, they are often hyperlinked directly to their definition in the glossary.
- Help Feature - The help feature assists users in executing basic and advanced system functions, from navigating through the system, to generating a report. The help feature is accessible from every page in the CID Web Site through the "Help" button at the top of each screen.
- Report Type Selection Bars - The CID home page has selection bars for three types of report, including: Ready-to-Read Reports, Standard Reports, and User-Defined Reports.

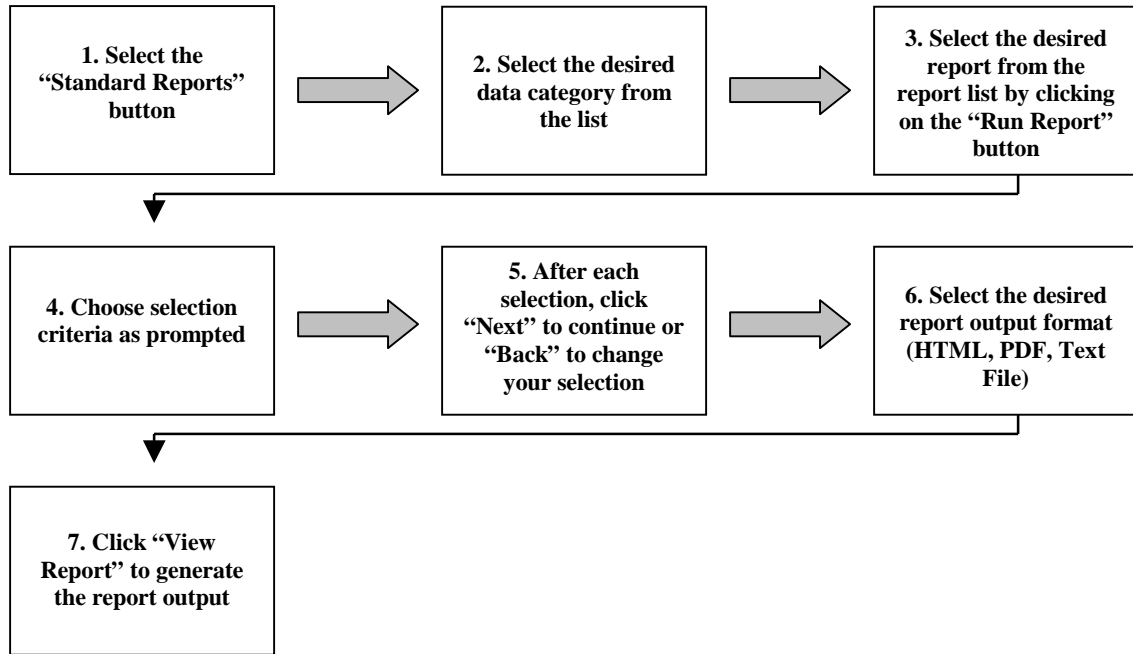
### Easy Steps to Running a Ready-to-Read Report



To Run the Site Profile report from the CID Homepage:



**Easy Steps to Running a Standard Report**



**Easy Steps for Using the User-Defined (Ad-Hoc) Reports Feature**

