

## **THE ADVANCEMENT OF PUBLIC AWARENESS, CONCERNING TRU WASTE CHARACTERIZATION, USING A VIRTUAL DOCUMENT**

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### **ABSTRACT**

Building public trust and confidence through openness is a goal of the DOE Carlsbad Field Office for the Waste Isolation Pilot Plant (WIPP). The objective of the virtual document described in this paper is to give the public an overview of the waste characterization steps, an understanding of how waste characterization instrumentation works, and the type and amount of data generated from a batch of drums. The document is intended to be published on a web page and/or distributed at public meetings on CDs. Users may gain as much information as they desire regarding the transuranic (TRU) waste characterization program, starting at the highest level requirements (drivers) and progressing to more and more detail regarding how the requirements are met. Included are links to:

- 1) drivers (which include laws, permits and DOE Orders)
- 2) various characterization steps required for transportation and disposal under WIPP's Hazardous Waste Facility Permit
- 3) physical/chemical basis for each characterization method
- 4) types of data produced
- 5) quality assurance process that accompanies each measurement

Examples of each type of characterization method in use across the DOE complex are included.

The original skeleton of the document was constructed in a PowerPoint presentation and included descriptions of each section of the waste characterization program. This original document had a brief overview of Acceptable Knowledge, Non-Destructive Examination, Non-Destructive Assay, Small Quantity sites, and the National Certification Team. A student intern was assigned the project of converting the document to a virtual format and to discuss each subject in depth.

The resulting product is a fully functional virtual document that works in a web browser and functions like a web page. All documents that were referenced, linked to, or associated, are included on the virtual document's CD.

WIPP has been engaged in a variety of Hazardous Waste Facility Permit modification activities. During the public meetings, discussion centered on proposed changes to the characterization program. The philosophy behind the virtual document is to show the characterization process as a whole, rather than as isolated parts. In addition to public meetings, other uses for the information might be as a training tool for new employees at the WIPP facility to show them where their activities fit into the overall scheme, as well as an employee review to help prepare for waste certification audits.

## **INTRODUCTION**

Throughout history, human ignorance has bred fear. When people learn about what they fear, they are less likely to be afraid of it, or at least to judge if mitigating steps are sufficient to balance their fears. The goal of this virtual document is to educate the public by describing the overall process (to the level of detail to which users care to avail themselves) of characterizing TRU Waste. When this document is presented to the public they will have access to every aspect of the characterization process and be able to gain an understanding of the Department of Energy's comprehensive TRU waste characterization process. With the new era of web communication, elements of TRU waste characterization can be accessed through independent searches of a variety of DOE and other educational sites. However, the new technology also allows us to create a new kind of document—the virtual document, which can be distributed electronically to a potentially vast audience. It can be utilized to advance WIPP's ongoing goal of education by providing the relevant links at the appropriate places in a document describing the overall TRU waste characterization process.

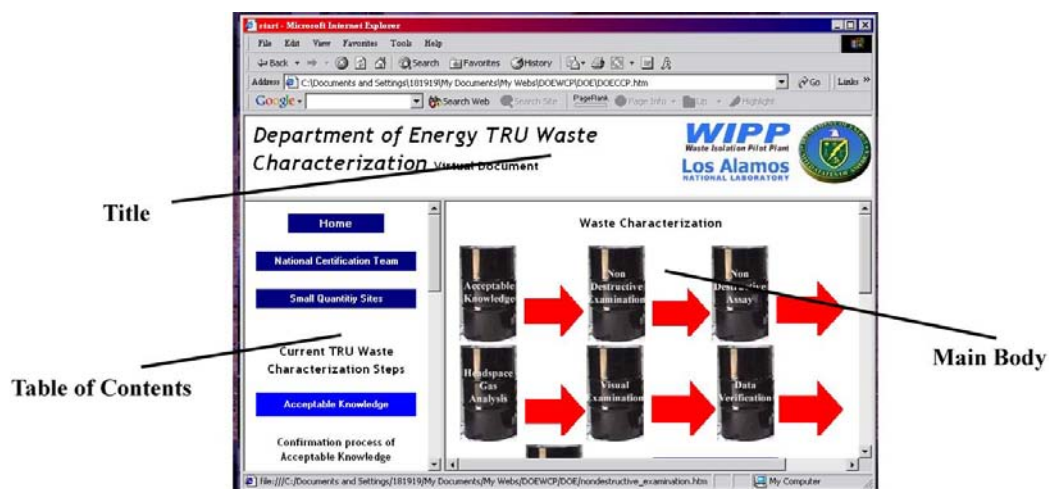
## **THE PILOT VIRTUAL DOCUMENT**

### **Basic Structure**

The opening page of the virtual document is a simple instructional page on how to use it. This page includes links to two different kinds of virtual documents. One document uses frames, which makes for easy navigation (Fig 1.) However, frames do not work on some older browsers, so a second version of the document is included in standard format. After opening the main page, the reader is presented with an opening summary of the waste characterization program as well as a map or path, which demonstrates the order in which the characterization takes place. A list of all of the laws and regulations are on this page. The designations for State Laws, Federal Laws, and DOE orders link to corresponding pages with a brief description of each set of requirements. These descriptions link further to the actual documents. Readers then have the option to view their choice of several thousand pages of laws, regulations, and orders, which shape the waste characterization program. The Law section of this particular document is not as descriptive as the other parts because the overall document is designed to describe the characterization process. In addition to requirements, the main page contains the main steps of TRU waste characterization with links to additional detail regarding those steps (Fig. 1.) The table of contents, which is in the left frame, and the title, which is in the top frame, remains on the page throughout the entire document if the reader uses frames. Links to each main characterization step, the references, a detailed list of acronyms and a link to download acrobat reader is included in the table of contents (Fig. 1.) Each waste

characterization step contains links, as do the laws, but with greater detail, which is described in the “Sub- Details” section of this paper.

The overall design of the paper utilizes the C-A-R-P (Conformance-Alignment-Repetition-Proximity) technique to enhance the interest and readability of the information. The opening page, in the main body section (Fig. 1), demonstrates proximity and alignment. The orderly appearance of the waste barrels is a result of center justification and good use of space. The table of contents at the left was designed with alignment, conformance, and repetition. The use of center justification for all graphics and text, grouping of topics by color, and repeating a color scheme for related topics, respectively. The intern was able to use a tool called *themes* in the web design program, Microsoft FrontPage, that allowed him to keep the entire document in the same style. Thus, the intern was able to achieve contrast, repetition, alignment, and proximity consistently.



**Fig. 1. Opening Page of the Virtual Document.**

### Sub details

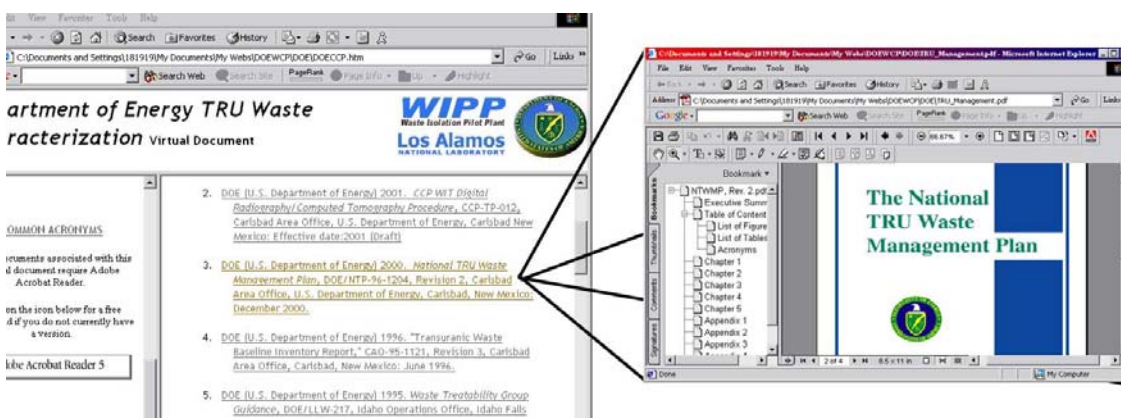
There are five main waste characterization steps, a data verification step, and a waste certification step. Each step can be accessed further for a one-to-three page description, which then can be linked further into 10 to 20 one-to-four page descriptions. Those descriptions sometimes link to further explanatory sections or specific papers and documents. The end result is a tree of information that allows users to access all the information they want for a particular subject. Each step in the characterization process in the virtual document contains detailed and upper level descriptions of that step's documentation and Quality Control verification. The procedures used to collect the data are also linked to. In addition, for each section of a batch data report form, a link connects further to upper level descriptions.

## Reports and data sheets

When readers finish reading all the information on each characterization step they have the option to explore further details or see actual batch data report forms. The batch data report forms are taken from the Central Characterization Program (CCP) written by Los Alamos National Laboratory, Carlsbad Office, for certification of TRU waste to be shipped to and disposed at WIPP. All batch data report forms are included in this virtual document in portable document format, PDF, a standard for distributing electronic documents that is both device and application independent, meaning that is available for most computing platforms, and the user does not require the applications that generated the reports to view them. If the viewer does not have an Adobe Acrobat reader, a link exists with corresponding instructions to download a free version of the reader.

## Books referenced are included

In the assembly of this document, several books were referenced. After several weeks of research, all of the books were located in PDF format. When permissions were granted, every book referenced in the virtual document was included in PDF format on the CD. Each time the virtual document references a book, that reference is a link to the bibliography section of the document. Readers can access this section of the document separately by clicking on the References tab on the left side of the screen. The bibliography or Reference, section of the virtual document lists each reference in standard format. The difference between a normal document's reference section and the Virtual document's reference sections is that each reference is a link to the electronic version of the document referred to (Fig. 2.)



**Fig. 2. A demonstration of how electronic files are available for all references.**

## **HOW INFORMATION WAS GATHERED**

The student intern held several short conferences with each National TRU Waste Characterization Team member. After each conference, the intern wrote a summary of the corresponding step in waste characterization. The Waste Isolation Pilot Plant provided the intern with library and web design resources. Through the library resources the intern was able to obtain most of the books that were referenced in PDF format. The library also provided the student with access to all laws and regulations that correspond to characterization of TRU waste. After completing the document, the intern went to Los Alamos National Laboratory (LANL) and visited their characterization program. Interviews with LANL operators allowed the intern to clarify the process of characterization and complete the virtual document. After the document was complete, the intern distributed each section of the virtual document to its corresponding National Characterization Team member for review.

## **CONCLUSION**

### **Advantages**

As discussed in the introduction, public awareness is a goal of the DOE Carlsbad Field Office for the Waste Isolation Pilot Plant (WIPP). If the public does not understand the waste isolation process, they may naturally disagree with every aspect of its efforts to handle waste. This virtual document is designed to describe the TRU waste characterization process simply but comprehensively. The TRU waste characterization process can be very complicated to most people. Because of this obstacle, the intern wrote each lower level description so that someone with a high school level education could easily understand it. While simplifying the grammar and technicality, the program was still clearly represented. When a person reads the lower level description, he or she is more knowledgeable on that specific section and will more than likely be able to move on to the upper level description. When that person has read and understood the upper level description, then he or she is more likely to understand the actual technical documents. With this multi-level style and virtual interaction the reader can stay interested and hopefully will understand the process. The information in the virtual document might be used as a training tool for new employees at the WIPP facility to show them where their activities fit into the overall scheme, as well as an employee review to help prepare for waste certification audits. The Generator sites may want to use it for new operators and waste handlers as a beginners training tool for the same reasons. If employees know about all the other parts of the characterization process, they can be more effective.

### **Disadvantages**

Because the characterization program is still under development, this virtual document will describe how the program *was* instead of how it is now. One option is to put the

document on a server and to update it when changes occur. Another disadvantage occurs in presenting the information to anyone who wants to view the document but who does not have access to a web browser. However most computers now days are equipped with everything needed to view this document. Members of the public who do not have a computer will not have as easy access to the information presented, but computing resources are available in most public libraries.

### **Future Work**

The future of this style of document is dependant upon its acceptance by the Los Alamos National Laboratory's customer. It has not been presented to the customer or any stakeholders yet. If the customer approves the format, LANL may incorporate this style in describing other processes. The document is currently in the review process. It has not been presented to the public or to any internal employees aside from the editorial reviewers. If accepted, the document may be published on a web site so that it can be easily updated. CD's may also be created for distribution at public meetings.

### **ACKNOWLEDGEMENTS**

This work was done by a summer intern under the advisement of the co-authors for Los Alamos National Laboratory – Carlsbad Office. Westinghouse, a contractor for the Department of Energy, provided most of the electronic documents that were included in the virtual document.