Appendix E

Description of Research Strategies Used in Study

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E.0 Uranium Mass Balance Project Document Retrieval And Review Process

Due to the time available, complexity and range of information to be researched at Hanford (see Figure E-1), the Uranium Mass Balance Project Team decided to use existing processes and computer software where ever practical. This appendix describes adaptation and use of those resources for this project. A flowchart of the overall retrieval and document review process is provided in Figure E-2.

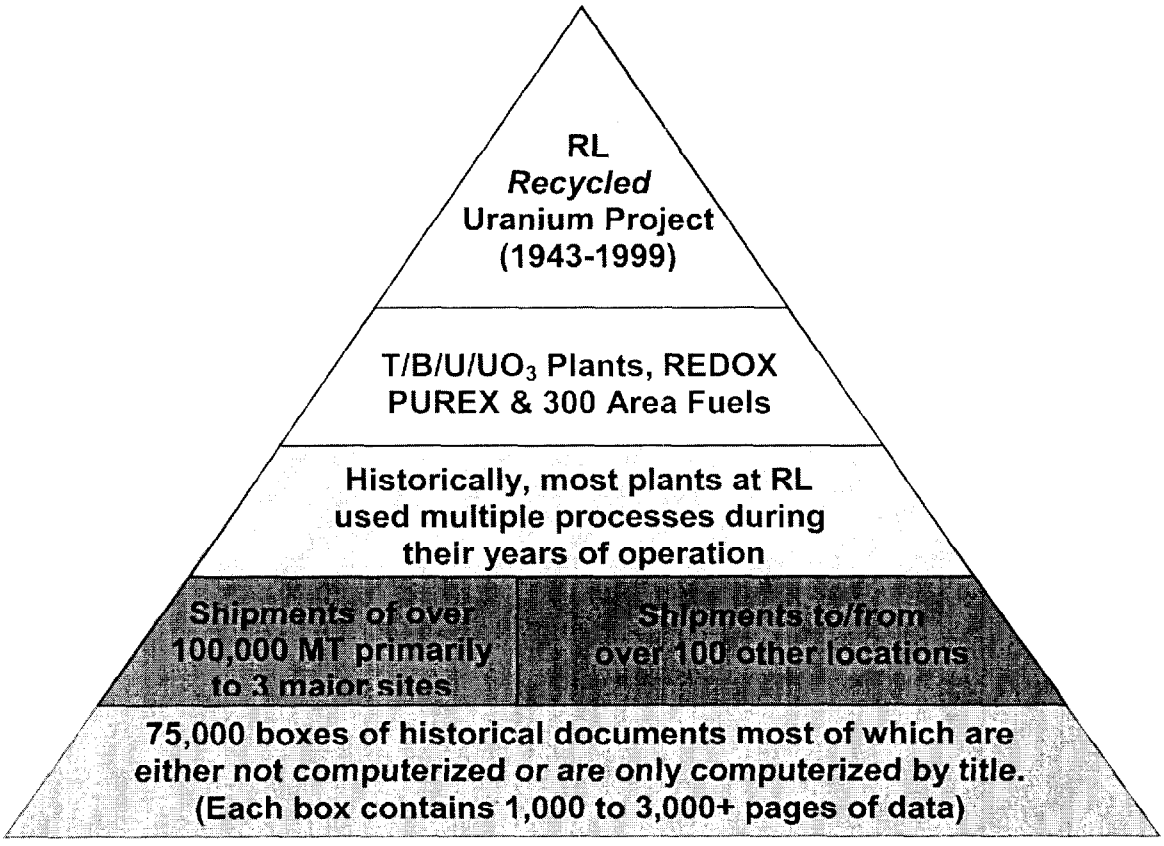
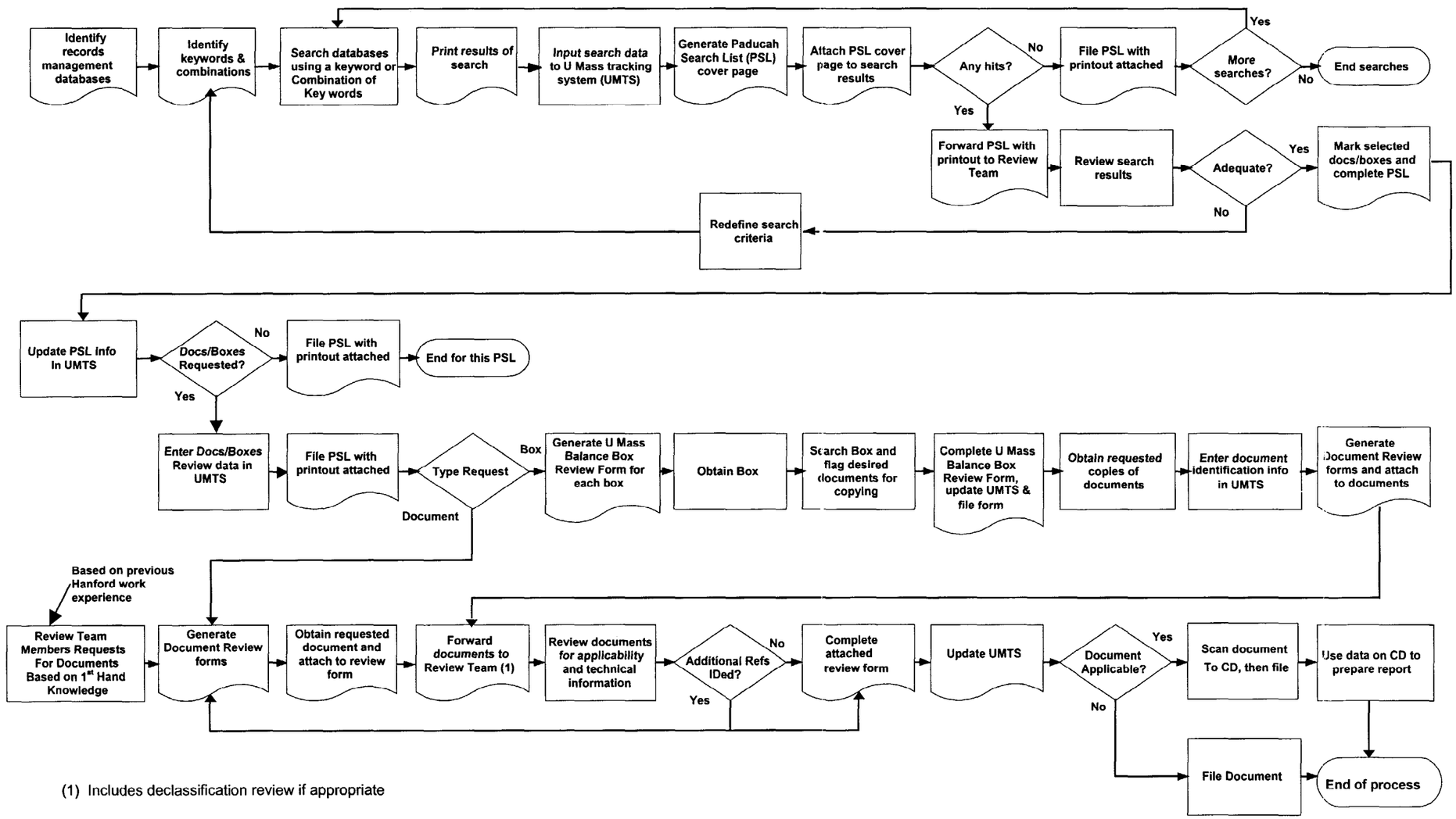


Figure E-1 Complexity and Range of Information to be Researched at Hanford



(1) Includes declassification review if appropriate

Figure E-2 Uranium Mass Balance Project Document Identification/Review Process

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E.1 Databases Used

The Technical Review Team members were selected based on their previous experience at Hanford, in most cases including experience directly related to one or more of the facilities involved in the uranium recovery program. Once the team was assembled, the members, based on their past experience, identified the types of records that would be needed to respond to the four specific points in the Deputy Secretary of Energy's letter of direction dated September 15, 1999 [Glauthier, 1999]. Several existing databases were identified that catalogued various types of documentation that might be applicable to this project were searched. These were:

- *Human Radiation Experiments Information Management System (HREX)* – This publicly accessible database was created in 1994 and contains approximately 392,000 pages of historical documents related to radiation experiments on human subjects performed by or for the Departments of Defense, Energy, Health and Human Services, and Veterans Affairs, as well as the Nuclear Regulatory Commission, the National Aeronautical and Space Administration, the Central Intelligence Agency, and their predecessor organizations.

- *OpenNet* – This database includes references to Department of Energy (DOE) documents that were declassified and made publicly available after October 1, 1994, in compliance with former Secretary Hazel O'Leary's Openness Initiative. It presently contains approximately 400,000 documents; however, the declassification process is still in progress.

- *Records Holding Task Group* – This collection of approximately 102,000 classified documents is held in the records holding area of the DOE's Oak Ridge Operations Office. In the summer of 1998, the Hanford "Downwinders" Litigation staff reviewed the entire collection and indexed all Hanford-related documents, which resulted in a listing of approximately 14,000 Hanford related documents. This Hanford-related listing was searched as part of the U-Mass study.

- *Hanford Site Historian Database* – This database contains documents gathered by the Site Historian in generating several publicly available publications related to various aspects of the Hanford site history.

- *Document Declassification Tracking System (DDTS)* – This is a site database created in 1995 with approximately 61,000 classified and formerly classified Hanford documents.

- *Record Holding Area Management Information System (RHA-MIS)* – This database was developed in the mid-1970s as the Hanford Site master database for managing RL and its contractors' archived boxes of records in storage. The system currently tracks the location and general content of approximately 75,000 boxes of records

from the field to various storage locations, including the Federal Records Center in Seattle, WA.

- *Document Tracking Application (DTA)* – Created in the mid-1970s, this system contains approximately 41,000 classified documents.

- *Master* – This system was created in the mid-1970s and contains approximately 750,000 engineering documents related to the Fast Flux Test Facility. Other contractor documents were added to the system between 1982 and 1993, when this system was replaced with the Records Management Information System (RMIS).

- *Records Management Information System* – This system was created in 1993 and consists of 14 different subsystems with over 1,700,000 documents. The system was not retrofitted to capture documents issued prior to its startup; however, some older documents have been added to the system from time-to-time in special cases. Only the following subsystems were of interest to the Project:

  - Records – This subsystem contains over 640,000 documents, including ALARA records, correspondence, declassified documents, engineering drawings, legacy/historical information, media highlights, management system documents, radiological survey records, technical documents, publications, and work packages.

  - Tank Farms Information Center (TFIC) – This subsystem contains primarily older Westinghouse Hanford Company and Rockwell Hanford Company documents related to the tank farms.

  - Solid Waste – This subsystem contains hazardous waste manifests.

  - RL – This subsystem contains RL correspondence.

  - Administrative Record (AR) – This subsystem contains documents relied on or considered in order to arrive at a final decision for remedial action for hazardous waste management.

Although, three additional RMIS subsystems were identified and searched, later analyses verified these files could have been eliminated because the information they contained was not germane to the Project.

E.2 Database Keyword Searches

The Technical Review Team identified keywords or combinations of keywords that related to the facilities, materials, and types of documents that would be used in the database searches in an attempt to identify documents relevant to the Team's

evaluation. Table E-1 shows the primary keywords that were used, normally in combination, in the searches. The team also identified variations in the way in which the keywords might appear in the titles or documents identified in the databases. Combining the keywords into meaningful logical expressions resulted in identifying several hundred queries/combinations of queries to be run on each of the various databases.

Each specific query was assigned a unique identification number (Paducah Search List or PSL number) and was logged into a Project database along with:

- Keywords and logic used in the search
- Name of the database searched
- Date of the search
- Name of the researcher
- Number of documents matching the search criteria (or "hits")
- Date the search results were provided to the Technical Review Team

The above information was reflected on a database generated cover sheet that was then attached to the search results printout. The printout identified the documents or boxes of records that satisfied the search criteria. The cover sheet and printout were then delivered to the Technical Review Team for review.

If the number of hits on a particular query exceeded 200, only the first two pages of the results were printed and provided for review. The problem of a high number of hits was generally caused by of one of two things:

1) The search criterion was too general.

2) In some databases documents have been scanned and digitized and full text searches using optical character recognition (OCR) software is available; however both the lack of quality of the original documents and the numerous different fonts used in them caused the OCR software to register many false hits.

In those cases, a Technical Review Team member would evaluate the first two pages of hits and determine whether to ask for the rest of the results or to narrow the search criteria and have the search performed again.

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Table E-1 Keywords Used in Searching Databases

Type	Primary Keyword	Variations of Keyword
Hanford Facilities	T-PLANT	T PLANT, 221-T, 221 T, 221T
	B-PLANT	B PLANT, 221-B, 221 B, 221B
	U-PLANT	TBP PLANT, TBP-PLANT, 221-U, 221 U, 221U
	REDOX	S-PLANT, S PLANT, 202S, 202-S, 202 S
	PUREX	A-PLANT, A PLANT, 202A, 202-A, 202 A
	UO_3 PLANT	UO3-PLANT, U03 PLANT, U03-PLANT, UD3 PLANT, UD3-PLANT, 224-U, 224 U, 224U, 224-UA, 224 UA, 224UA
	FUEL FABRICATION	307, 308, 313, 333
Materials	URANIUM	U3O8, U308, DEPLETED URANIUM, DU, D.U., D. U., ENRICHED URANIUM, EU, E.U., E. U., URANIUM SCRAP, URANIUM WASTE; URANIUM TRIOXIDE, UO3, U03, UD3
	NEPTUNIUM	NP-237, NP237, NP 237
	URANYL NITRATE HEXAHYDRATE	UNH, U.N.H., U. N. H.
Activities/ Documents	MAT* BALANCE	
	SEP* FACTOR	
	FLOW SHEET	FLOW-SHEET, FLOWSHEET
	DECON* FACTOR	
	SPEC*	PRODUCT, UO3, U03, UD3, URANIUM, ENRICHED URANIUM, URANIUM SCRAP
	ANALYTICAL REPORT	
	SHIP*	
	RECEI*	
	REPORT	WEEKLY, MONTHLY, QUARTERLY, SEMI
Other Facilities & Sites	K-25	K25, K 25
	Y-12	Y12, Y 12
	FERNALD	NATL LEAD OF OHIO, NATIONAL LEAD, NAT'L LEAD, NATL LEAD, NLO, N.L.O., N. L. O.
	RMI	R.M.I., R. M. I.
	GASEOUS DIFFUSION	
	UNION CARBIDE	
	PORTSMOUTH	
	PADUCAH	

* Indicates use of a wildcard

E.3 Technical Review of Keyword Search Results

Upon receipt of the Key Word search results, one or more Technical Review Team members reviewed the computer printout associated with each PSL and, based on the

titles of the documents listed, determined whether copies of any of the documents should be obtained for Team review. Where appropriate, document titles were flagged to indicate that they were being requested for review. In the case of the RHA-MIS database, the computer printouts provided box numbers, storage locations, and a general description of the types of documents in each box. Again, one or more Review Team members reviewed the list of boxes and flagged those that might contain records related to the Project. The reviewer(s) completed the PSL cover sheet to include the reviewer's name, date of review, whether any documents or boxes were selected and, if so, the number of documents or boxes selected, along with any comments the reviewer wished to make.

E.4 Obtaining Documents and Boxes of Records

After review by the Technical Review Team the PSL cover sheet and its associated list were used to update the Project database with the information provided from the reviewers. For each document requested by the Technical Review Team, the following information was entered into the Project database:

- A unique document tracking number (for the request)
- The unique PSL number that resulted in the request
- Document identification number (if any)
- Document revision
- Document alias number(s) (if any)
- Document date
- Document Title
- Document source
- Box number
- File folder title (if any)
- Name of requestor

The requested document was then either printed out the document (if it was available online) or a copy was ordered from the appropriate source. When the document became available, the database generated a Document Review/Production Order containing the above information as well as the date the document was delivered to the requestor and the number of pages in the document. In those cases where the requests were for entire boxes of records, arrangements were made to retrieve the boxes from offsite storage if necessary and made available for review in the RL Records Holding Area (RL-RHA). Once the boxes were available in the RL-RHA, the Technical Review Team members who had requested them were notified via Box Review Tracking forms which identified the box number, the box owner, security classification of the box content, and whether the box had been completely scanned. The form also provided the box tracking history.

E.5 Additional Document Searches

Because of their previous work experience at Hanford, many of the Technical Review Team members were aware of the existence and location of specific documents that would be relevant to the Team's efforts. In such cases the Team member would obtain a copy of a document. A Document Review/Production Order form was initiated for each document obtained in this manner and it was entered into and tracked in the Project database.

E.6 Technical Review of Documents

One or more members of the Technical Review Team reviewed each document requested to determine whether it contained information relevant to the Team's efforts. If a document contained no relevant information, the reviewer marked the Document Review/Production Order form to indicate that the document was not relevant and then signed and dated the form and returned both to to be used to update the Project database. If a document did contain relevant information, the reviewer also indicated the security classification status, and whether declassification in whole or part was needed. The reviewer also marked the form to identify keywords to be associated with the document in the Project database to assist in future searches by the Project Team or others.

In the case of boxes of records, a Review Team member (normally, the requestor, but not always) examined the contents of a box and flagged any relevant documents for copying. The RL-RHA staff made copies upon request and a Document Review/Production Order was initiated for each document copied. The information was then entered into the previously described Project database.

E.7 Project Records

The Project records for this project include:

- Documentation (completed Paducah Search List or PSL) for each query run on each database and the marked up computer printouts indicating the documents requested.

- A completed Document Review/Production Order for each of the documents requested showing the results of the Teams review.

- A completed Box Review Tracking form for each box requested showing the results of the box review.

- A computer database that cross-links the queries to the PSLs, the PSLs to the document requests, and the keywords assigned to a document by the Technical Review Team.

In preparing its report, the Technical Review Team cited references to the sources of information used in the report. Copies of the source documents will be retained by RL until it is determined they are no longer needed. It is the Project's intent to scan these documents onto CD-ROMs and catalog them in a database to minimize future search and duplicating time and expense.

E.8 References

Glauthier 1999
Memorandum, T. J. Glauthier, Deputy Secretary of Energy, to All Departmental Elements, *Paducah Gaseous Diffusion Plant – Follow-Up Activities,* U.S. Department of Energy, Washington, DC, September 15, 1999