DOCUMENT SYSTEMS FOR SITE STEWARDSHIP
AT THE U.S. DEPARTMENT OF ENERGY GRAND JUNCTION OFFICE

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ABSTRACT

As government and private industry embark on the stewardship of radioactive waste disposal sites and any associated contaminated soil and groundwater, they are faced with creating, maintaining, and accessing the documents necessary to carry on the stewardship mission ad infinitum. The stewardship mission includes not only long-term site care but also timely resolution of issues that could result from cover failure, sign deterioration, access restrictions, litigation, transfer of ownership to the public, or even disputed grazing rights. Because these types of issues ultimately involve protection of human health and the environment, their resolution is urgent. This urgency places a high demand on timely access and retrieval of information.

To meet the demands and responsibilities of long-term stewardship, the U.S. Department of Energy Grand Junction Office (DOE-GJO) has developed a document management strategy and system based on experience with such projects as the Uranium Mill Tailing Remedial Action (UMTRA) Ground Water Project (22 sites); Monticello Remedial Action Project in Monticello, Utah; Pinellas (STAR Center) Environmental Restoration Program in Largo, Florida; and Long-Term Surveillance and Monitoring Program (27 transferred and transitional sites). The system, which includes management processes and an electronic database, was structured for flexibility to permit easy integration of new and existing document collections (records and references). Key to the overall success of the system is the ability of all users to access the system from any computer work station, whether located in Grand Junction, Colorado, or Monticello, Utah.

PREPARING FOR LONG-TERM STEWARDSHIP
Site stewardship is not just routine maintenance of a site. During the life of a remediated site or disposal cell, stewardship will require monitoring of various hazards; maintaining protective barriers; responding to spills or natural disasters, such as floods, tornadoes, or earthquakes; and ensuring that all site closure agreements are met and that protection of human health and the environment is adequate and continuous. Stewards may also be called upon to manage site resources and to ensure that finances are available for continued protective activities. In some instances where the site may be released or conveyed to public or private ownership, redevelopment and planning activities will need to be supported.

To date, GJO as a site steward has dealt with unexpected issues on bank erosion, unprecedented seasonal flooding, grazing rights, groundwater contamination, invasive vegetation, cover failure, radon barrier failures, cell leakage, vandalism, access, and even fill degradation. At time of site closure, none of these issues could be anticipated, nor can any other emergent issues that could result from resource management, damages from earthquakes or tornados, transfers of ownership, or change in use during the next 50, 100, 200, or 1,000 years.

INFORMATION ROADBLOCKS TO SUCCESSFUL STEWARDSHIP

Required Data--In preparation for any number of scenarios during the stewardship life cycle, stewards need to define, acquire, and protect those types of information that will allow them and future stewards to respond to unexpected issues effectively and in a timely manner. To be prepared for unanticipated issues, we must assemble documents containing the following types of information and data:

·   Present and historical chemical, radioactive, and physical hazards, both natural and man-made.
·   Present and historical releases of contaminants.
·   Active and passive devices for preventing exposure to both humans and the environment.
·   Current (including postclosure) and historical site processes.
·   Current (including postclosure) and historical infrastructure, such as buildings, utilities, pipelines, tanks, and wells.
·   Current and historical agreements, regulations, permits, and other legal requirements associated with stewardship.
·   Property records related to the site, easements, and other on-site access rights.
·   Off-site access rights through public and private property for monitor wells and active or passive control systems.
·   Mineral, water, and other natural resources rights.
·   Locations and descriptions of cultural resources.
·   Habitats and species of concern.
·   Relationship of site, resources, and access to Native American Tribes or special interest groups.
·   Site topography, hydrogeology, and geology.
·   Site and surrounding property land use.
·   Public exposure data.
·   Current and historical concerns expressed by the public.

Key Documents--During its stewardship role to date, staff members at GJO have determined that the following types of documents (both past and present in most instances) contain key data for resolving emergent issues:

·   Site completion report.
·   Access agreement.
·   Site legal description.
·   Permits (e.g., land use, well, right-of-way, and U.S. Army Corps of Engineers 404/dredge and fill).

- Lists of stakeholders and points of contact.
- Baseline risk assessment (BLRA).
- Site observational work plan (SOWP).
- Water sampling and analysis plan (SAP).
- Health and safety plan.
- Remedial action plan (RAP).
- Work plan.
- Record of Decision (ROD).
- Categorical exclusion (CX).
- Environmental assessment (EA).
- Environmental impact statement (EIS).
- Finding of no significant impact (FONSI).
- Compliance action plan (CAP)/groundwater compliance action plan (GCAP).
- Management plans (e.g., waste management plan, operating plan, and environmental compliance plan).
- Calculations (e.g., erosion cover thickness and contaminated groundwater plume), analytical data, and groundwater models.
- Groundwater alternate concentration limits (ACLs) and applications (and support documents).
- Site, design, and construction drawings (including final topographical maps).
- Construction specifications.
- Monitor well completion logs, data, and reports.
- Photographs and 35-mm slides.
- Related technical correspondence.

Access--Even if data and documents can be obtained, how will efficient access to the information be established and then maintained for the life of the stewardship activities? How will new documents created during stewardship be retained for future access? Two of the greatest roadblocks we, as long-term stewards, face today are gaining and maintaining *efficient* access to needed information and data.

BREAKING INFORMATION ROADBLOCKS
While many discussions are under way on standardization of data and document types, format, and media for sites undergoing cleanup, GJO is already faced with groundwater and long-term stewardship responsibilities for roughly 27 different sites. Access to the various documents and data was needed immediately to resolve groundwater contamination, cover failure, and erosion issues. To minimize reliance on the previous staffs' site expertise, which was inefficient and costly, key site documentation (containing the types of data and information mentioned previously) was indexed, boxed, and transferred to GJO rather than to a Federal Records Center with the rest of the site collection. This acquisition of documents should have provided GJO personnel with all the needed information, but variations in format, indexing terminology, older documentation requirements, and overall recordkeeping practices created an information maze. The search process was time consuming and frequently lead to a complete roadblock. In addition, only a handful of the staff had access to the limited search tools (e.g., inaccurate catalogs, outdated document data, and indices with insufficient detail).

To overcome the roadblocks and more effectively navigate through the documents, GJO developed a user friendly document system to provide search, retrieval, and control of site-specific documents. In addition, a pilot study on integration of acquired UMTRA site records is under way. To improve the overall effectiveness of data and document inquiries, technical references were integrated into the document system for maximum access to data and a graded approach to control and retention. This integration of project documents with references equips the technical staff with a single tool for locating site-specific information.

FUNCTIONAL ELEMENTS OF THE GJO DOCUMENT SYSTEM

The GJO document system (GJO Record Log System) is an in-house multiuser Visual Foxpro application that currently runs under Windows 3.1, Windows 95, and Windows NT operating systems. The minimum and recommended system requirements are

- IBM PC or compatible 486-66 (Pentium 150 or greater recommended) 16 MB RAM (32 to 64 RAM recommended).
- Windows 3.11/Windows 95/Windows NT (Windows 95 or Windows NT recommended).
- 5 MB disk space for application.
- 1 to 50 MB disk space for data, depending on number of records (48,000 records equal approximately 34 MB).
- No software requirements (Visual Foxpro not required to run the application).

The system currently manages records for nine discrete projects, DOE-GJO, and the selected documents in the GJO Technical Library. The nine projects include more than 30 different sites. Approximately 50,000 active and inactive records and references (documents) are in the system, with an expectation that the number of entries will double in the next 2 years. Roughly 20 of the 150 GJO staff personnel with access to the database perform data entry.

Bar-Code Technology--Bar-code labels are used to assign unique identifiers to each record. These labels provide the capability to transfer, identify, check in and check out, and locate documents quickly and accurately by either scanning or keying the unique document identifier into the database. With project identifiers printed on the labels, misfiled records are minimized.

Data and Access Security--Nightly system backups prevent inadvertent loss of data. In addition, the system administrator can scan data as they are entered to detect any data corruption or errors. Access security is maintained at four levels: "view only," "edit only" for those documents an individual has added, "transmit" for indexing and sending documents to inactive storage, and "edit all" to modify any entry and transmit for storage. These rights are assigned by individual projects and are based on an individual's needs, responsibilities, and training.

Discrete Data Fields--The use of discrete data fields is integral to the search capabilities. Key information concerning the content of the document is captured, along with document date, author, and recipient. The format for entry is established on the basis of the technical staff data needs, records coordinators' retrieval experience, and input by the system administrator. This team approach to data format ensures that the information is retrievable by all users and system search capabilities are maximized (see Fig. 1).

Fig. 1. Data Fields

Project-Specific Working File Index--The development of a working file index for each project provides not only a roadmap to the records and references but also the guidance required to control and protect these documents. The working file index contains unique file numbers and titles, the current custodian, the exact location of each file, any internal transfer requirements, the retention schedule for each file, and any special handling requirements (e.g., Privacy Act, quality, or epidemiological records). All index data are entered into the document system so that the current location and requirements for each document are applied when the file number is entered (i.e., these index data fields are not keyed for each document). This indexing process not only expedites data entry, but also minimizes errors.

Control--Control is maintained for the life cycle of the document with an integrated check-in and check-out process (i.e., regardless of status [active or inactive] or location, one system provides accountability for the documents). The system has the unique capability to manage and identify documents in multiple locations with multiple custodians (see check-in/check-out data in Fig. 1).

Reports--Reports are easily generated with the system. The reports have been designed to manage access and control, maintain data consistency and accuracy, generate transfer documentation, and provide system-generated validation reports for both active and inactive

documents. Plus new reports are easily added. The use and development of various reports has saved numerous administrative work hours that would normally have been expended to validate files and to identify and correct anomalies from assimilated project data (see Fig. 2).
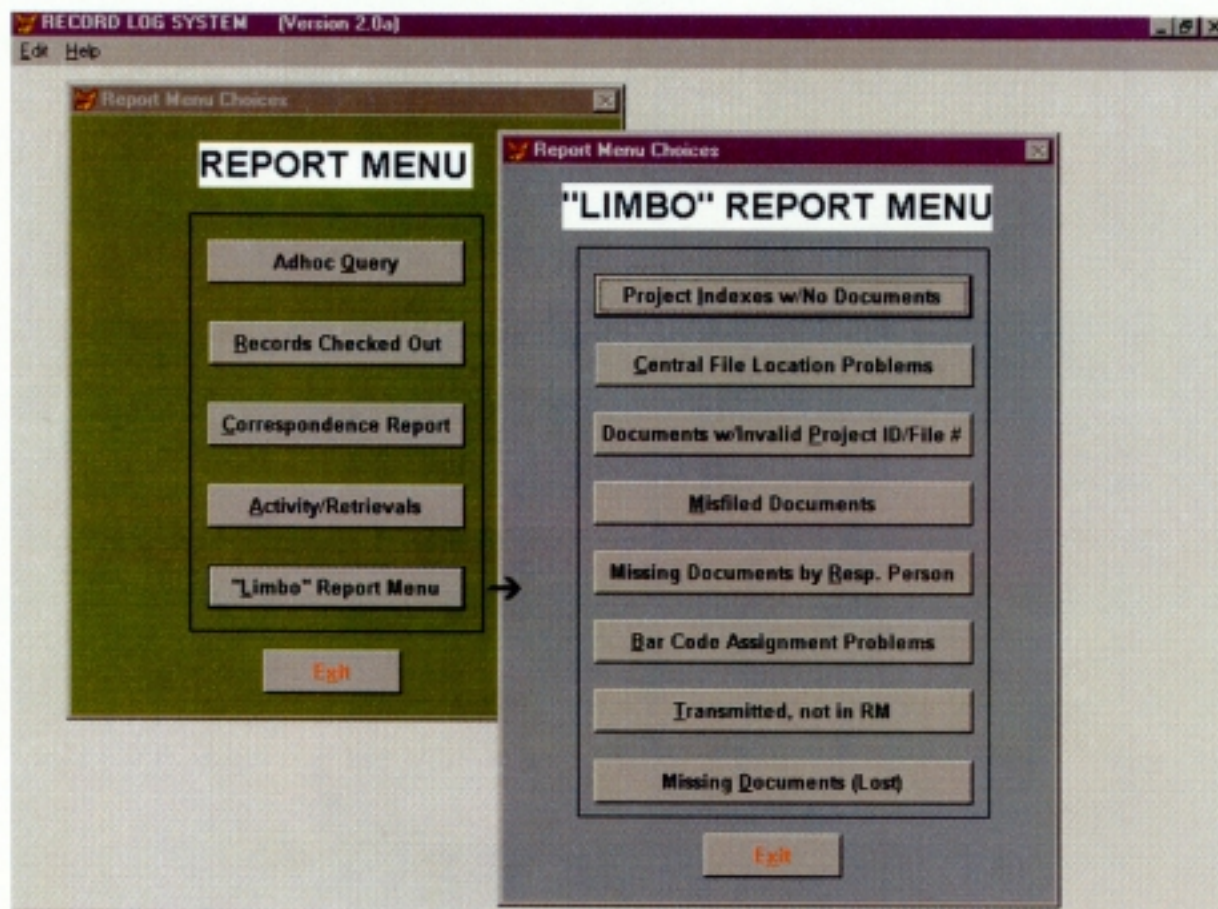

Fig. 2. Reporting Features

Search Engines--The system includes both large and small search engines. Neither of the search engines is case sensitive (i.e., RADON, Radon, RaDon, and radon used as a key word for a search will identify the same documents). This flexibility permits more readable text to be used when preparing document descriptions.

The small search engine is associated with individual entries (i.e., only one document entry can be viewed at a time). Only one set of project documents can be searched at a time. The small search engine provides search capabilities on document number, file number, date, and key words in the author, recipient, and title/description data fields. No reports can be generated, only a screen print.

The larger search engine (Ad Hoc Query) provides search capabilities on almost all data fields, with range searches on document numbers and document date (see Fig. 3). Key word searches are possible in all text fields. Wildcard characters can be used in all but the numerical data fields. All projects or a single project can be searched for information. Plus, the results of the search can be displayed by document number, date or file number. A hard copy printout is available to capture the results of all searches generated by the large search engine.

Fig. 3. Search Parameters for Large Search Engine (Ad Hoc Query)

On-Line Help File--An on-line help file supports system use at all levels and ensures that all system maintenance is not single-contributor dependent. The file contains step-by-step instructions for all operations (e.g., logging in, data entry, performing a search, transferring documents, running reports, and even using acronyms) in the system (see Fig. 4).
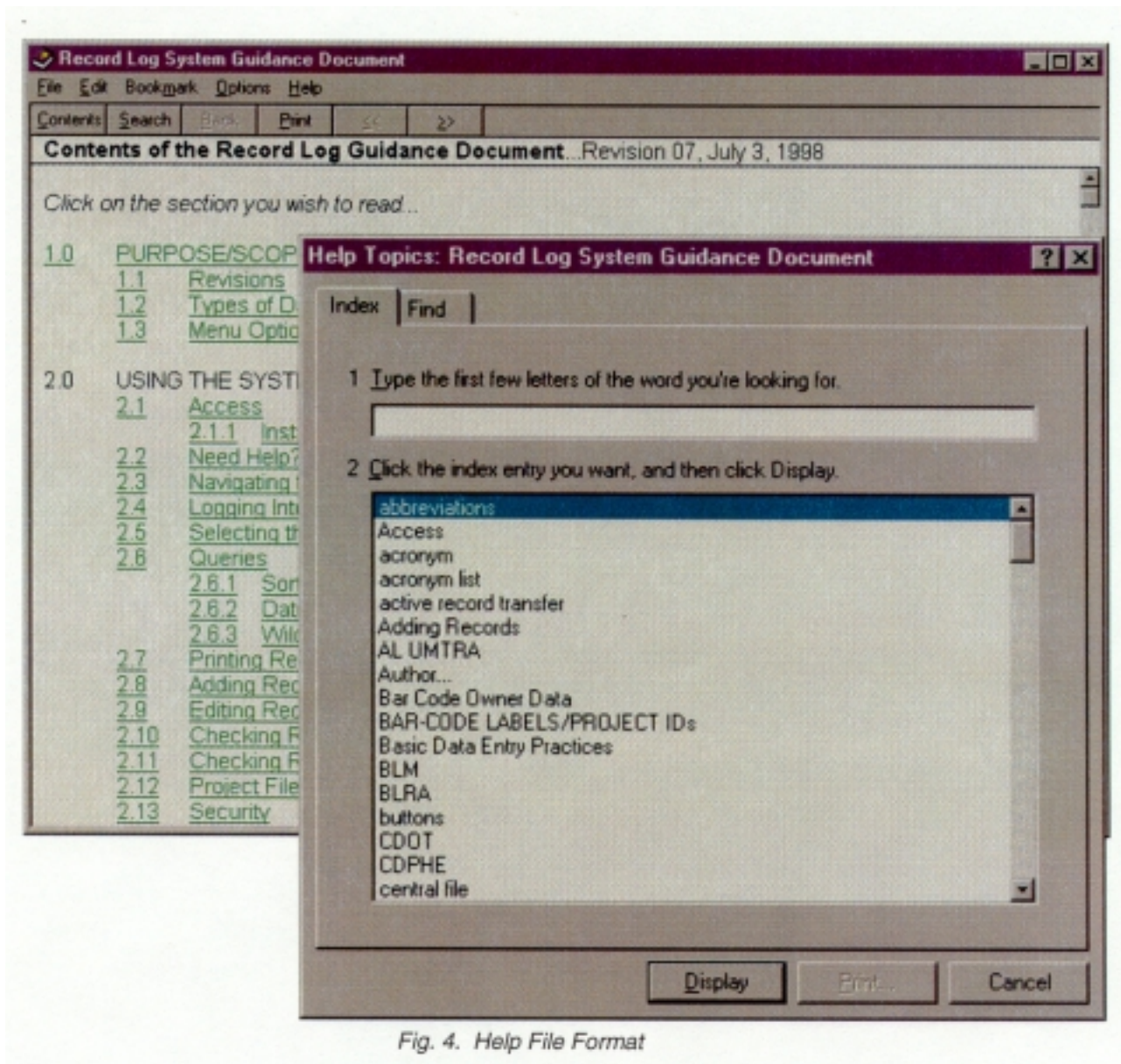
Fig. 4. Help File Format

WHY DOES THIS DOCUMENT SYSTEM WORK?

The success of the GJO document system is based on the system's functional attributes, flexibility, and data quality and on buy-in by management and users. These attributes include

· Format and functions are easy and comprehensive for all staffing levels (from scientist to data entry staff). The system can be navigated with only rudimentary computer skills.
· A step-by step help file is available on line for all management processes, reports, and system maintenance functions.
· All personnel have access to view and search document data.
· Access to the system is from an individual's personal computer and can be run concurrent with other software (e.g., WordPerfect, MSWord, Lotus, and CCMail).
· With established guidance for data entry, the data format is consistent and document descriptions are complete and accurate. These combine to make searches productive.

· The large search engine is flexible and user friendly.
· Check-in and check-out functions make tracking documents easy and accurate.
· One page brochures are available for casual users, with hands-on training for those who would be performing data entry or file maintenance.
· The use of the working file index reduces data entry time and promotes accuracy.
· The flexible format permits adaptation of historical project filing systems and subsequent integration of document data into a unified system.
· Each unique document always has its current location (even if checked out) displayed so that retrieval requires only one call or visit.
· Project documents and selected technical references can be searched simultaneously with the same search parameter.

Perhaps most importantly, the system permits work to proceed and issues to be resolved in a timely manner and ensures access to data during the stewardship life cycle.

USABILITY AND LONGEVITY

Rapidly changing technology increases the risk of subscribing to an obsolete document system and medium. Although many media may appear more efficient, we do not have confirmed results on the life of these media (e.g., compact disks [CDS]). In addition, the National Archives and Records Administration will not accept most electronic media as federal records.

As site stewards, we must ensure that the documents we manage and create to support long-term stewardship will be as accessible tomorrow as they are today. GJO has addressed this challenge by creating an electronic document management system to access hard copy records that can be incorporated into other systems when a universal electronic technology and media have been established.

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