

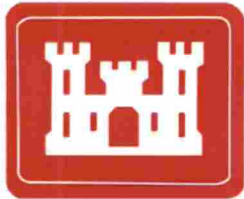
**VERSION 1.0**

**ENVIRONMENTAL INFORMATION  
MANAGEMENT PLAN**

**FOR THE**

**FORT WINGATE DEPOT ACTIVITY  
FORT WINGATE, NEW MEXICO**

*Prepared for*



**US Army Corps  
of Engineers®**

**U.S. Army Corps of Engineers  
Fort Worth District  
Contract No. FA4890-04-D-0004  
Delivery Order DY16**

**October 30, 2009**



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**Prepared for**

**U.S. Army Corps of Engineers  
Fort Worth District  
CESWF-PER-DD  
Fort Worth, TX 76102-0300**

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## ACRONYMS

AOC	area of concern
BCT	BRAC Cleanup Team
BEC	BRAC Environmental Coordinator
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BRAC	Base Realignment and Closure
COR	Contracting Officer's Representative
DENIX	Defense Environmental Network and Information Exchange
DoD	U. S. Department of Defense
DOI	U. S. Department of the Interior
EDD	electronic data deliverable
EIMP	Environmental Information Management Plan
EIMS	Environmental Information Management System
EPA	U. S. Environmental Protection Agency
ERIS	Environmental Restoration Information System
ESRI	Environmental Systems Research Institute, Inc.
FTP	file transfer protocol
FWDA	Fort Wingate Depot Activity
GB	gigabyte
GIS	geographic information system
ID	identification
MB	megabyte
Mbps	million bits per second
MDA	Missile Defense Agency
NAD83	North American Datum of 1983
NMED	New Mexico Environment Department
ODBC	Open Database Connectivity
PC	personal computer
PDF	portable document format
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act of 1976
READ	Repository of Environmental Army Documents
RFI	RCRA facility investigation
SAIC	Science Applications International Corporation
SDSFIE	Spatial Data Standard for Facilities, Infrastructure, and Environment
SEIMS	SAIC's Environmental Information Management System
SWMU	solid waste management unit
USACE	U. S. Army Corps of Engineers
USAEC	U. S. Army Environmental Command
UTM	Universal Transverse Mercator
UXO	unexploded ordnance

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## 1.0 INTRODUCTION

The Fort Wingate Depot Activity (FWDA) Environmental Information Management System (EIMS) is a system of computer hardware, software, procedures, and people designed to make information readily available to fulfill the needs of the environmental cleanup activities at FWDA. This Environmental Information Management Plan (EIMP) describes the reasons for implementing an EIMS, specifications for each component of the EIMS, the procedures to be followed, and the roles and responsibilities of the EIMS users.

FWDA is the site of a former Army ammunition depot and demolition facility located in McKinley County in western New Mexico on U. S. Highway 66, 7 miles east of Gallup on the south side of Interstate 40. Approximately one-third of the facility's 21,131 acres is under current re-use by the Missile Defense Agency (MDA). Another 967 acres have been returned to the Bureau of Land Management (BLM), which holds those lands for the future beneficial use of the Navajo and Zuni tribes. The remaining lands also are planned to go to BLM for tribal use following their cleanup.

The facility was established in 1918 around an old cavalry post. From 1918 until its closure under the Base Realignment and Closure (BRAC) Program in January 1993, the facility stored and demolished ammunition. MDA occasionally uses a portion of the facility to launch missiles to White Sands Missile Range, which is about 150 miles to the southeast. A private company, TPL, Inc., has operated facilities that demilitarized conventional munitions at the site. The TPL, Inc., facility closed in 2007.

Environmental investigation and cleanup efforts, including munitions clearance, have been made on a nearly continuous basis since 1994. Major environmental concerns at this site include munitions hazards and groundwater contamination by explosives and nitrates. On December 31, 2005, the New Mexico Environment Department (NMED) approved the FWDA Post-closure Permit [Resource Conservation and Recovery Act of 1976 (RCRA) Permit No. NM 6213820974, hereafter called the Permit], establishing a basis for a more-scheduled cleanup of the facility. Past practices deposited ordnance-related waste on and off the facility. The Permit identifies nearly 100 solid waste management units (SWMUs) or areas of concern (AOCs). The Permit has prioritized the restoration efforts. The first efforts are focused on identifying and fencing off lands affected by unexploded ordnance (UXO). Other efforts of high priority include the development of a groundwater corrective action program and assessing the contamination at Parcel 21 where the trinitrotoluene leaching beds were located.

In 1995, a BRAC Cleanup Team (BCT) was formed at FWDA. BCTs are formed to enhance environmental decision-making at BRAC Installations where property will become available for transfer to the community. This team approach is intended to foster partnering; accelerate the environmental cleanup process; and expedite timely, cost-effective, and environmentally responsible disposal and re-use decisions. The BCT is comprised of representatives from the U. S. Department of Defense (DoD), the state, and the U. S. Environmental Protection Agency (EPA). At FWDA, the stakeholders to whom the land will eventually be transferred also participate in BCT. These additional stakeholders represent the Navajo Nation, Pueblo of Zuni, Bureau of Indian Affairs (BIA), and BLM.

A Restoration Advisory Board (RAB) represents the interests of the surrounding communities in the cleanup process at FWDA. The RAB gives all neighbors, including those who are not represented by the Zuni and Navajo members of the BCT, a forum to learn about the cleanup progress at FWDA, to ask questions about the process, and to voice concerns. The RAB is currently inactive pending an annual public interest survey.

Fort Wingate contains sites rich in cultural heritage and historical significance. The cleanup program has been designed to avoid disturbing these sites. Representatives of both the Navajo Nation and Pueblo of Zuni participate in all field activities that might potentially disturb significant sites. Representatives identify areas to be avoided.

As environmental protection activities at FWDA move into the actual remediation of contaminated areas, the access to pre-existing information about the site is essential for safe, efficient, and effective remediation. Information produced during the early construction and demolition years at FWDA, such as as-built plans, construction specifications, operational standard operating procedures, and operational records, can provide many benefits to the environmental program if it is readily available. Access to historical information allows workers to

- more efficiently identify the areas of potential contamination and the types of contamination that might be encountered,
- better identify potential hazards and obstacles to the remediation process, and
- estimate the types and amounts of materials that must be remediated to aid in planning the allocation of remediation resources.

Information generated since the 1970s includes Installation environmental assessments, facility groundwater studies, RCRA permit applications, asbestos surveys and abatement reports, environmental impact statements, underground storage tank closure plans, UXO surveys, ordnance and explosives removal reports, stormwater pollution prevention plans, cultural resources inventories, remedial investigations, feasibility studies, RCRA closure plans, polychlorinated biphenyl investigations, work plans, health and safety plans, pilot studies, release assessments, removal actions, explosives safety submissions, and other Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and RCRA documents. Access to these documents through the FWDA EIMS

- helps to avoid the costly re-evaluation of areas that have already been investigated;
- fulfills legal requirements for documenting compliance with regulations;
- provides information that may be used to evaluate the effectiveness of remediation;
- allows decisions to be made quickly, without collection of additional field data; and
- allows the integration of information from multiple areas to assess larger-scale or facility-wide questions.

Over the 10 years that the Permit will be in effect, and likely beyond, various government entities and contractors will write reports detailing the condition, need for remediation, and status of each of the AOCs and SWMUs identified in the Permit. There is a large amount of environmental information that has already been developed and much new environmental information that will be generated within the next few years.



There are multiple stakeholders at FWDA who need access to information and who produce information that is relevant to the environmental program at FWDA. These stakeholders include the following:

- DoD;
- U. S. Army;
- FWDA BRAC Environmental Coordinator (BEC);
- U. S. Army Environmental Command (USAEC);
- U. S. Army Corps of Engineers (USACE);
- U. S. Army Center for Health Promotion and Preventive Medicine;
- DoD MDA;
- NMED;
- EPA;
- U. S. Department of the Interior (DOI), BIA;
- DOI, BLM;
- Navajo Nation;
- Pueblo of Zuni;
- RAB;
- general public; and
- contractors/subcontractors.

The large amount of available information, the large volumes of information that will be produced as work at FWDA continues, and the number of stakeholders who need ready access to the information are just a few of the reasons for operating the EIMS at FWDA.

The EIMS is a system of computer hardware, software, procedures, and people that facilitates the rapid, secure, and reliable flow of information among users. The EIMS provides a variety of users access to information of different types (such as maps, documents, and environmental characterization and monitoring data) from different sources. The EIMS:

- provides a systematic means of accessing existing information,
- reduces the time needed to find information,
- provides an efficient means to add new information,
- prevents loss of information,
- provides varying levels of secure access to this information to different data users, and
- presents information in ways (such as maps and tables) that make data analysis and decision-making more efficient.

By making data exchange and recordkeeping more efficient, the EIMS saves time and money for the Army and other stakeholders at FWDA.

This plan summarizes the information management needs of the stakeholders listed above and provides specifications for the FWDA EIMS designed to fulfill those needs.

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## 2.0 NEEDS ASSESSMENT SUMMARY

To begin the process of developing an EIMS, the *Fort Wingate Depot Activity Environmental Information Management Needs Assessment* was prepared (SAIC 2006). The Needs Assessment report presented the results of a survey of stakeholders that identified the information flow to and from the stakeholders as well as the current infrastructure and procedures for managing this information. An overview of the EIMS requirements is presented below.

### 2.1 INFORMATION NEEDS AND FLOW

The information needs of the FWDA stakeholders centered around four types of information: documents, spatial information, data from laboratory analytical and field measurements, and data concerning the nature and location of UXO.

Documents are the primary source of information for most stakeholders. All stakeholders need access to the document deliverables specified in the Permit. These documents include the Community Relations Plan, closure plans, closure reports, monitoring plans, monitoring reports, work plans, RCRA facility investigation (RFI) reports, interim measures work plans, interim measures operation and maintenance plans, corrective measures studies reports, construction completion reports, corrective measure completion reports, site safety and health plans, and others. Besides reports, the Army is required by the Permit (Section I.K.1) to keep photographs, maps, figures, drawings, tables, attachments, enclosures, and appendices relating to previous activities that may have resulted in the generation, management, or potential release of solid waste or hazardous material. The Army must maintain a written Operating Record, all submittals related to the Permit, personnel training documents, and emergency contact information (Permit Section II.I).

Documents submitted to fulfill requirements of the Permit are public information and have no restrictions on distribution. Restricted distribution is required for draft pre-submittal documents that have not completed the review process. Restrictions are required for documents that identify locations of cultural sites. Army documents that include budget and financial information require restricted distribution.

The Permit requires that all reports be submitted in hard-copy and electronic format. Documents that were used in preparation of the Permit and are in the Information Repository have been scanned into electronic portable document format (PDF) files. Thus most relevant documents are already in some electronic format. The stakeholders need a way to locate and retrieve relevant documents. The Permit requires that the Information Repository include a searchable database that contains an index of all documents stored in the repository (Permit Section I.K.1). New documents must be added to the repository within 30 days of submittal to NMED or placement in the Operating Record.

Spatial information is critical to the cleanup process at FWDA. FWDA extends across over 20,000 acres of property. Stakeholders need to know where Parcels, AOCs, and SWMUs are located relative to other man-made and natural features on the map and relative to neighboring properties. Stakeholders must be able to identify and obtain documents and laboratory analytical and field measurement data related to specified locations on the map. The EIMS must allow stakeholders to view the spatial distribution of information, compare the spatial distribution of different types of information, and retrieve information based on its location.



Currently, there is much spatial information available in electronic format compatible with Environmental Systems Research Institute, Inc. (ESRI) ArcView™ software. There is a need to standardize this information so that all stakeholders are working with the most up-to-date information.

Hundreds of thousands of individual measurements have been collected, and will be collected, to characterize the facility. These measurements are critical for making sound decisions about which areas require cleanup and the adequacy of the cleanup operations conducted. These data represent a large investment in time and money, and must be preserved from loss or corruption and be available for summary, assessments, and modeling. While much of these data are in an electronic database, they are not readily available to all stakeholders. A systematic procedure is needed for adding and maintaining the data.

Numerous studies have been conducted to characterize the nature and physical distribution of UXO. Information from these studies must be combined to obtain a comprehensive map of where UXO has been found and removed and where known UXO remains.

## **2.2 INFRASTRUCTURE**

Most members of the BCT have access to computers with Pentium or better processors, at least 500 MB of memory, Windows 2000® or XP® operating systems, and Microsoft Office™ applications. Most members have high-speed Internet access. Most organizations on the cleanup team have a Geographic Information System (GIS) Department that uses ArcView™ or ArcInfo™ software. Most team members do not have training in the use of GIS software.

Much of the community surrounding FWDA is rural and would most likely have Internet access through dialup modem. The Octavia Fellin Public Library in Gallup has 22 public access computers with high-speed Internet access.

The Army, the state of New Mexico, the tribes, DOI, and EPA all have large computer systems that are capable of supporting an EIMS for FWDA. Most would prefer not to host an EIMS because of the security issues that would need to be addressed to allow users from different organizations and the public to access computers within their respective networks. Hosting an EIMS would require time, effort, and expense to obtain required approvals, configure hardware and software, and maintain the system. Currently a contractor, Science Applications International Corporation (SAIC), has been selected to host the FWDA EIMS on its servers.

## **2.3 INFORMATION RESTRICTIONS**

Nearly all of the information related to the Permit is public information that is required by the Permit to be available for public inspection in the Information Repository. Drafts of reports require review by the Army before they are submitted to the state or released to the public. The distribution of information that identifies the locations of cultural and archaeological sites is restricted to only those on a need-to-know basis. The Army budget and financial information will not be included in the EIMS. The EIMS shall not include any classified or 'Official Use Only' information.

Nearly all organizations had restrictions on software that could be installed on their computers. Most required that any new software be reviewed and approved by Information Technology personnel before installation. Many organizations limit the size of email attachments to 5 or 10 MB.

## 2.4 ENVIRONMENTAL INFORMATION MANAGEMENT SYSTEM PREFERENCES

Most stakeholders preferred an EIMS that could be accessed across the Internet. They preferred a computer system that was simple and required menu selections to find and obtain the information that they needed. Stakeholders wanted documents, maps, schedules, and data available for access. They did not want to have to learn new computer programs. They want to be able to quickly find documents and data related to specific locations on the map.

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### 3.0 ENVIRONMENTAL INFORMATION MANAGEMENT SYSTEM OVERVIEW

#### 3.1 INFORMATION FLOW

The Needs Assessment report identified two user groups with significant differences in needs: (1) the public and (2) the FWDA cleanup team. The information flow in the EIMS has been designed to accommodate these two user groups (Figure 3-1).

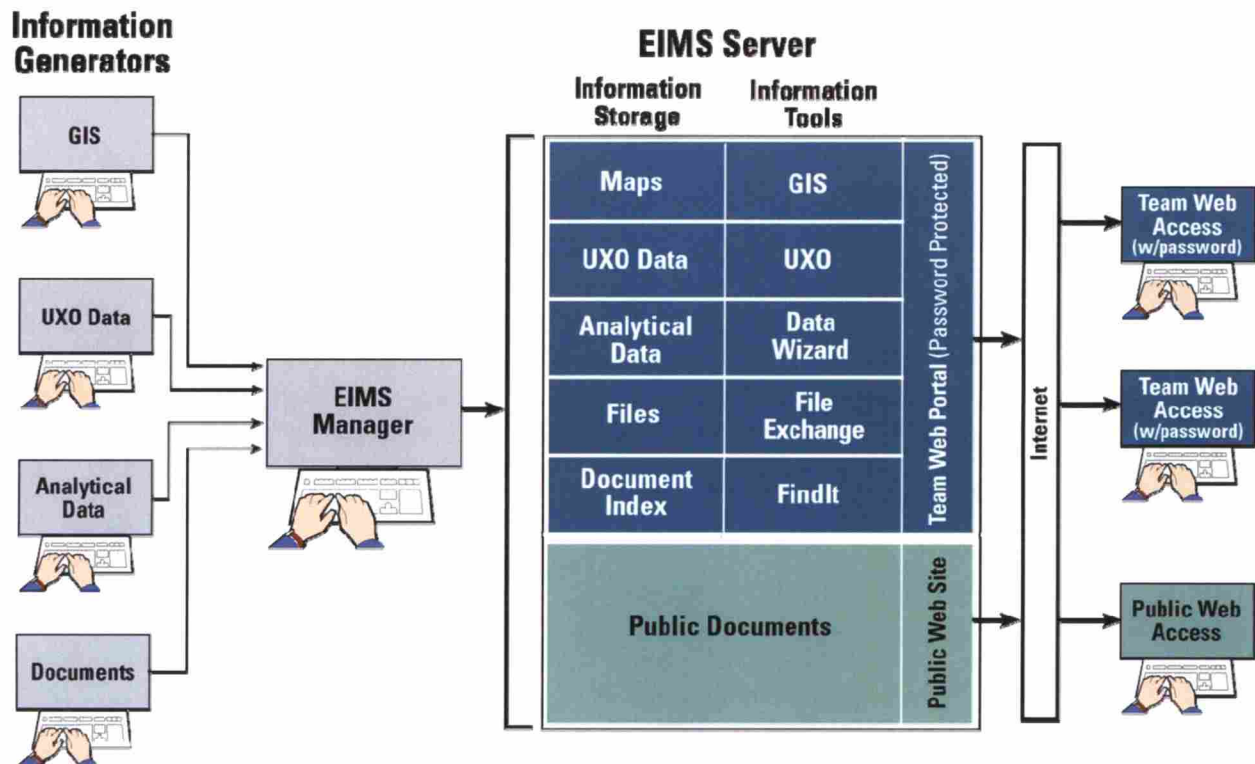


Figure 3-1. Information Flow for the EIMS

The public requires access to information that has been reviewed and approved for release. Documents and information must be made readily available to the public in a timely manner to facilitate public comment on proposed cleanup actions at FWDA. The public needs to know whom to contact when they have questions or comments on the activities at FWDA. A public website has been developed to fill these needs. The public requires only a computer with a Web browser to find and view information across the Internet. The public website has been designed to be simple to use and have intuitive functionality.

The FWDA environmental working team (made up of management, support, contractors, and regulators) requires access to information as soon as it is available. Immediate access allows the FWDA team to make rapid decisions and to recognize and correct errors. The FWDA team may need to access large amounts of information, including laboratory analytical results and field measurements for each environmental characterization sample taken; location and nature of UXO; maps of sampling locations, roads, buildings, water bodies, and other topographic features; and all documents related to the cleanup



process at FWDA. Its members need an interface that can provide a rapid response, even for large information requests.

A separate website called the Team Web Portal has been designed as the doorway for team members to access the FWDA information. The Team Web Portal is a password-protected website that allows access only to registered team members. The Team Web Portal serves as a bulletin board for FWDA team members providing announcements of new information, a file transfer protocol (FTP) exchange site, a project contact list, a schedule of cleanup activities, and a user's guide. The Team Web Portal provides links to Web applications that allow users to search for and retrieve documents, maps, and UXO and analytical data related to FWDA. The team members require only a computer with a Web browser to find and view information across the Internet. The Team Web Portal has been designed to be simple to use and have intuitive functionality.

The EIMS has been designed to process the four primary types of information required by the stakeholders at FWDA: documents, maps, UXO information, and environmental laboratory analyses and field data. Each type of information is the focus of a separate component of the EIMS because each type of information has some unique storage and management requirements. Pre-existing documents are electronically scanned with optical character recognition and formatted into PDF files using Adobe Acrobat™. New documents are created in Microsoft Word™ and formatted into PDF files using Adobe Acrobat™. Documents are indexed, located, and retrieved using a Web-based document management program called FindIt. Maps are created in ESRI geodatabase format and displayed from the team website using ESRI ArcIMS™ software. The Web GIS application serves to integrate the information by relating data to locations on the map. UXO information can be queried and displayed in tabular format or as a map layer. Laboratory analytical data and associated field measurements and information are stored in a SQL-Server database on the Web server. Users can retrieve data through the 'Data Wizard' Web interface or through the GIS Web application.

### 3.2 SYSTEM COMPONENTS

This EIMP describes each of the EIMS components in detail. It describes the roles and responsibilities of the people who use the EIMS, the computer hardware and software, and each functional component of the EIMS including: Public Website, Team Web Portal, Document Management Module, Data Management Module, GIS Module, and UXO Module.

People are the key component of the EIMS. People generate the information used in the EIMS, maintain the EIMS hardware and software, keep the information secure, and rely on accurate up-to-date information to perform their jobs. Information will flow smoothly through the system only when users fulfill their assigned roles. Chapter 4 describes the roles and responsibilities of the people who use the EIMS.

Computer servers provide a place to store large amounts of information and a platform for software for retrieving and analyzing information. The servers shall be properly maintained to keep the information secure and to provide rapid, reliable access. Chapter 5 describes the system hardware, operating system specifications, and current system configuration. This section also describes system backup and security procedures.

The FWDA Public Website shall include only information approved for public release and be protected from unauthorized changes. Chapter 6 describes the content of the public website and how information is submitted and posted to the site.

The Team Web Portal serves as a bulletin board for the BCT and as a gateway to software tools for retrieving and analyzing information. Chapter 7 describes the features of the portal and how to post and retrieve information to the portal.

Almost all of the FWDA cleanup information is reported in the form of documents. Chapter 8 describes how documents shall be formatted, indexed, and uploaded to the server.

Many laboratory analytical data and field measurements are collected to characterize the environmental conditions at FWDA, including information from field technicians, geologists, laboratory technicians, chemists, data quality assessors, and GIS analysts. Chapter 9 describes how this information can be uploaded to the EIMS and how it can be retrieved.

Nearly all of the environmental characterization data can be related to a spatial location. Chapter 10 describes the capabilities of the GIS component of the EIMS and describes how GIS information is uploaded and retrieved from the system.

The uploading and retrieval of UXO information is described in Chapter 11.

Chapter 12 contains the supporting references used in this report.

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## 4.0 ROLES AND RESPONSIBILITIES

While software tools are essential for the functioning of the EIMS, people make the system run. The roles and responsibilities of each FWDA cleanup team member must be defined.

### 4.1 FWDA EIMS CONTRACTING OFFICER'S REPRESENTATIVE

The FWDA EIMS Contracting Officer's Representative (COR) is the Army representative with direct responsibility for oversight of the EIMS. The COR has the following responsibilities:

- to verify that the EIMS Contractor has produced an EIMS that works as specified in this EIMP,
- to approve changes to the structure and function of the EIMS,
- to approve information such as documents and data for public access, and
- to approve information for addition to the EIMS.

The COR may delegate any or all of these responsibilities to another person when needed.

### 4.2 BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL COORDINATOR

The FWDA BEC is the Army representative with direct responsibility for identification of project-specific needs for the function and content of the EIMS. The BEC has the following responsibilities

- to identify functional requirements of the EIMS to the COR,
- to request changes to the structure and function of the EIMS to the COR,
- to request information such as documents and data for public access, and
- to identify and request information for addition to the EIMS.

The BEC may delegate any or all of these responsibilities to another person when needed.

### 4.3 ENVIRONMENTAL INFORMATION MANAGEMENT SYSTEM CONTRACTOR

The EIMS Contractor is the company responsible for assembling and maintaining the EIMS. The responsibilities on the EIMS Contractor include

- providing hardware that meets the system server requirements;
- providing software that meets the system requirements; and
- providing personnel to configure, manage, and maintain the EIMS.

### 4.4 ENVIRONMENTAL INFORMATION MANAGEMENT SYSTEM MANAGER

The EIMS Manager is the representative of the EIMS Contractor with overall responsibility for the establishment and functioning of the EIMS. The responsibilities of the EIMS Manager include

- meeting the implementation schedule for the EIMS,
- monitoring functioning of the EIMS,



- responding to questions concerning the functioning of the EIMS,
- documenting EIMS problems through the use of non-conformance reports,
- overseeing implementation of changes in the EIMS as specified by the BEC and approved by the COR, and
- assigning EIMS user names and initial passwords.

#### **4.5 NETWORK ADMINISTRATOR**

The Network Administrator manages the hardware and software required to provide the EIMS network service. The Network Administrator

- installs, configures, and maintains server hardware;
- installs, configures, and maintains server software;
- backs up data at specified intervals; and
- monitors the server for unauthorized access.

#### **4.6 DATABASE MANAGER**

The Database Manager is employed by the EIMS Contractor to assess and load data into the EIMS database. The Database Manager

- identifies and resolves problems with data before loading,
- loads data into the EIMS, and
- issues change notices to inform users when data have been changed.

#### **4.7 WEBMASTER**

The Webmaster is employed by the EIMS Contractor to design and make modifications to the EIMS websites. The Webmaster

- designs the EIMS websites based on specifications of the EIMP,
- updates the websites as requested by the EIMS Manager and as specified by the BEC and authorized by the COR, and
- identifies and resolves problems with the websites.

#### **4.8 GIS DATA MANAGER**

The GIS Data Manager is employed by the EIMS Contractor to manage map information. The GIS Data Manager

- converts pre-existing spatial information into the ArcSDE™ format,
- adds new information to the EIMS, and
- identifies and resolves problems with the GIS.

#### **4.9 DOCUMENT COORDINATOR**

The Document Coordinator manages the FWDA Information Repository. The Document Coordinator

- develops a classification and indexing scheme for FWDA documents in coordination with the BEC,
- catalogs and indexes documents when received,
- checks documents for compliance with the formatting guidelines,
- requests COR approval for public release, and
- forwards documents to the EIMS Manager for posting to websites.

#### **4.10 INFORMATION GENERATOR**

Information generators are contractors or government agencies that produce data as part of their tasks performed for the environmental program at FWDA. Information generators submit documents to the Document Coordinator and data or maps to the EIMS Manager in standard electronic deliverable format as specified for each type of information.

#### **4.11 EIMS USERS**

EIMS users are any of the FWDA stakeholders who use the EIMS. EIMS users are responsible for

- reporting any problems with information access, input, or retrieval to the EIMS Manager; and
- protecting user names and passwords if applicable.

The members of the FWDA EIMS team together provide for the rapid and reliable exchange of information among all of the information users.

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## 5.0 COMPUTER HARDWARE AND OPERATING SYSTEM CONFIGURATION, SETUP, AND MAINTENANCE

### 5.1 OVERVIEW

Computer servers and operating systems are needed to host the websites, data, and documents that are part of the EIMS. The system provides security to prevent unauthorized access and manipulation of the information. It is reliable and includes components that reduce the potential for time-out-of-service. The system has data backup capabilities that allow the restoration of data in the event of a system failure. The system is expandable to accept increasing amounts of data and usage in the future. The server is connected to the Internet. The information and functions of the EIMS may be supported by one or several servers. The exact configuration depends on system capabilities, user demand, and reliability and security considerations. The configuration may change in response to changes in technology, demand, or security concerns. This section provides a general overview of the system requirements.

The server that holds the data and software for the functioning EIMS is called the production server. In addition to this server, the EIMS Contractor maintains a separate server, called a development server, which is used for testing any changes or upgrades to the EIMS software, hardware, or the server operating system. New components and software are tested on the development server so that testing and changes do not interfere with the day-to-day function of the EIMS.

The EIMS has been designed for access using a personal computer (PC) with a Microsoft Windows 2000® or XP® operating system and Internet Explorer™ Version 6 or later Web browser. EIMS users may be able to access the EIMS using other Web browsers with other operating systems and hardware, but performance is not guaranteed. Specifications for PCs are also included below.

### 5.2 SYSTEM REQUIREMENTS

The configuration and maintenance of the server must meet the following requirements:

1. The server shall have sufficient disk storage space to contain the operating system; data management; networking and application software; and anticipated data, maps, and documents (estimated as 150 GB) plus space for temporary files. The server disk storage space shall be expandable. Storage requirements are estimated to increase 5 GB/year over the life of the Permit. The system shall be designed to expand to at least 200 GB.
2. The server shall have connection to the Internet sufficient that average requests can be processed in less than 1 minute (at least 1 Mbps).
3. The server shall have a device capable of making a backup copy of the entire database and software.
4. Data backup shall be scheduled so that, at most, 1 day's work would be lost in the event of equipment failure. (Backup is temporary data storage that allows restoration in the event of a mechanical or software failure or inadvertent deletion through human error.)
5. Monthly backups of all system information, including data, Web pages, and programs, shall be sent to FWDA (or its designee) to provide off-site storage for disaster recovery.

6. The server shall have an uninterruptible power supply sufficient to allow safe shutdown in the event of a power outage.
7. The operating system shall be capable of supporting data management and websites.
8. The EIMS shall be in continual operation, with downtime for maintenance or repairs not to exceed 10%.
9. The EIMS shall be capable of handling up to ten concurrent users.
10. The EIMS Operator shall use a separate server with software configuration equivalent to the production server for testing that software and hardware upgrades do not interfere with the function of the EIMS.
11. The EIMS Operator shall document the version of each computer program in use and inform users when a new version of software is installed.
12. The EIMS Operator shall maintain a list that describes the specifications of server system hardware and software required for system operation. The list shall include version numbers, patches, upgrades, and non-default settings required. The list shall be available for viewing from the Team Web Portal. (Access the FWDA EIMS Infrastructure Design Document from the EIMP link on the menu bar at <https://team.ftwingate.org>.)
13. The server shall have security provisions such as user names and passwords so that only authorized users have access to the programs and information.
14. The server firewall shall allow for access to the server by those authorized to view data and those authorized to make additions and changes.
15. It is recommended that users accessing the public website use a PC with sufficient capacity to run a Web browser (such as Internet Explorer™ Version 6 or later) and Adobe Acrobat™ 6.0 (or later) Reader. Website access requires a connection to the Internet. The higher the Internet access speed, the more quickly Web pages and documents can be viewed.
16. It is recommended that users accessing the Team Web Portal have a PC with a Pentium® 4/AMD 3000 or higher CPU, 1,024 MB or more RAM, and 40 GB or more disk space and use a Windows 2000 or XP operating system. Team Web Portal users should use Internet Explorer™ Version 6 or later as their Web browser. Team Web Portal users will need Adobe Acrobat™ 6.0 (or later) Reader to view PDF files and Microsoft Word 2000® (or later) to view documents and Microsoft Excel 2000® (or later) to view spreadsheets. High speed Internet access is recommended.

### 5.3 SYSTEM DESIGN

The EIMS Contractor is providing server capacity to house the FWDA Public Website; Team Web Portal; and associated documents, data, and applications. A T-1 line provides the connection between the servers and the Internet with 1 Mbps access speed. Microsoft SQL-Server® is operating on one server to support the EIMS databases for the document index, analytical data, UXO, and the ArcSDE™. All EIMS documents that are in PDF format are also stored on a server. Details of the EIMS hardware and software configuration may be found in the FWDA EIMS Infrastructure Design Document (accessed from the EIMP link on the menu bar at <https://team.ftwingate.org>). Because the FWDA EIMS Infrastructure Design Document contains information that is sensitive with respect to the security of the system, it will be provided only to those who have a specific need for that information.



## 5.4 PROCEDURES

EIMS data and software are backed up on a regular schedule. New and revised items are backed up daily. The entire system is backed up weekly. An archive DVD is sent monthly to the USACE, Fort Worth District for storage. Backup tapes are kept temporarily. Daily tapes are recycled after 1 week. Weekly tapes are recycled after 1 month.

The EIMS Manager assigns user identification names and passwords to all users of the EIMS. A user identification name and password are required for accessing the EIMS data through the Team Web Portal. The public website does not require a user name or password.

The EIMS is protected from unauthorized changes of information on the websites and database through the use of firewalls. Firewalls restrict the types of operations that may be performed on the server from other computers. Only the EIMS Manager, Network Administrator, Database Manager, Webmaster, GIS Data Manager, and Document Coordinator are authorized to make changes to the EIMS software and data. The system is checked at least weekly for attempts at unauthorized access to the servers. Attempted unauthorized access will be reported to the EIMS Manager and BEC.

After any significant system modifications, the EIMS Manager will test the system and document that the system meets all specifications listed in the system requirements.

## 5.5 RESPONSIBILITIES

The EIMS Contractor shall be responsible for managing server hardware and software so that it meets the system requirements.

The EIMS Manager shall be responsible for issuing user names and passwords, verifying that the system requirements have been met, and that the system is operated as specified in this EIMP.

The Network Administrator shall be responsible for installing, configuring, operating, and maintaining the hardware and software. The Network Administrator shall also be responsible for performing system backup as specified, archiving information when requested, and checking for unauthorized access to the EIMS.

## 5.6 SCHEDULE

Servers will be incrementally backed up daily and completely backed up weekly. Monthly archived DVDs will be sent to USACE. Data will be archived when requested by the EIMS Manager.

Within 1 month of any significant system modifications, the EIMS Manager will revise the FWDA EIMS Infrastructure Design Document and make it accessible through the Team Web Portal.

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## 6.0 PUBLIC WEBSITE

### 6.1 OVERVIEW

The EIMS includes a public website designed to inform interested readers, both the public and cleanup team members, of the activities and decisions related to the restoration of FWDA. This website provides authorized information in a simple, easy-to-use format that allows the reader to work from general site information to specific areas of investigation and then to actual scientific reports and summaries. Links to other relevant Web pages (such as EPA and NMED) are included and may be added/updated as necessary.

The EIMS Webmaster designs and maintains the FWDA Public Website. The information on the Web pages is updated approximately monthly with information supplied by the FWDA BCT and approved by the BEC (or his designee). New documents are posted to the website within 30 days of receipt by the Information Repository. The FWDA Public Website includes a search engine that allows users to find and retrieve documents based on key words or phrases supplied by the user. The information flow for the FWDA Public Website is diagrammed in Figure 6-1.

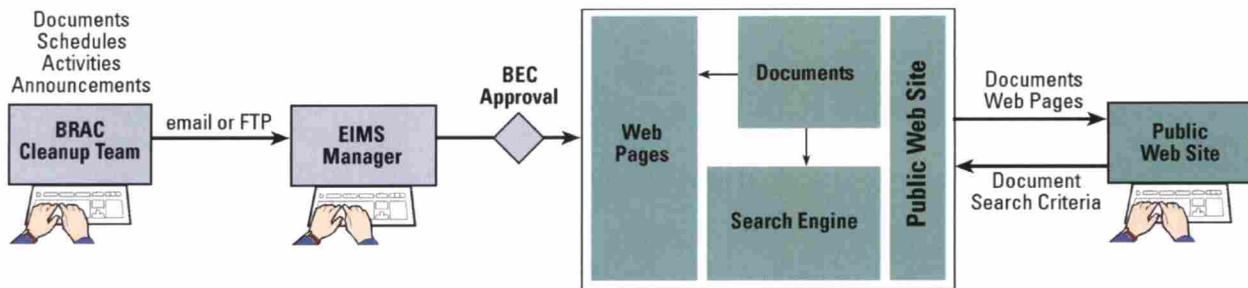


Figure 6-1. Information Flow for the Public Website

### 6.2 SYSTEM REQUIREMENTS

Following are the system requirements for the public website component of the EIMS:

1. The public website shall be accessible to anyone with Internet access and Web-browser software with capabilities equivalent to those of Internet Explorer™ Version 6.
2. Information for the public website shall be approved by the BEC before it is posted on the website.
3. The public website shall include at least the following information:
  - a. summary of the mission of, and activities at, FWDA;
  - b. history of FWDA;
  - c. description of the cleanup process;

- d. description of the areas to be cleaned up at FWDA;
  - e. map of FWDA that shows the location of cleanup parcels;
  - f. schedule of FWDA cleanup activities;
  - g. final reports and documents for public review;
  - h. capability to search for documents with user-supplied search criteria and retrieve electronic documents;
  - i. index to information in the Information Repository;
  - j. links to all Information Repository documents available in electronic format;
  - k. links to relevant websites [USACE, EPA, NMED, Defense Environmental Network and Information Exchange (DENIX), and USAEC];
  - l. description of opportunities for public involvement at FWDA; and
  - m. schedule of activities at FWDA that are open to the public.
4. The public website information shall be secured so that only authorized persons may make changes or additions to the content.
  5. The Web pages shall be designed to follow the guidelines supplied by the Army for compliance with Section 508 of the Rehabilitation Act.
  6. Web pages written to manage the public website shall be delivered to the Army upon completion of the task. The Army shall retain the right to use all such Web pages indefinitely.

### 6.3 SYSTEM DESIGN

The website home page describes what FWDA is and provides links to topics of interest. The topics include the following:

- *About FWDA,*
- *Ft. Wingate History,*
- *Today's Mission,*
- *Cleanup Program,*
- *Land Parcels,*
- *FWDA Documents,*
- *Related Links,*
- *Public Participation,*
- *Schedule of Events, and*
- *Search Documents.*

Each of these topics leads the reader to the next level of information. Each page of the website includes the panel with links to the other Web pages.



At the bottom of the home page are links to current information that is frequently updated. A 'What's New' panel summarizes any new issues of public interest. 'Current Cleanup Activities' summarizes the cleanup activities occurring at the current time. 'Cleanup/Closure Schedule' lists the time table for all scheduled cleanup activities into the future.

The *About FWDA* page displays a map showing the location of FWDA in New Mexico and describes the communities and landmarks which surround it.

The *Ft. Wingate History* page briefly describes activities at Fort Wingate from 1868 to the present and provides links to more detailed historical summaries.

The *Today's Mission* page explains that all ammunition storage and demilitarization at FWDA has ceased. FWDA's current mission is cleanup of contamination from past activities.

The *Cleanup Program* page describes the process followed for environmental studies and provides links to EPA websites with more detailed information.

The *Land Parcels* page explains that FWDA had been divided into parcels for cleanup and land transfer and presents a map of FWDA with each area parcel identified by number. Each area on the map is linked to the section of the Installation Action Plan that describes the area.

The *FWDA Documents* page provides the location of the FWDA Information Repository. The documents page links to other pages that list documents available for viewing in PDF format. The document lists include documents listed by date of publication, documents by study area, and documents for public review and comment.

The *Related Links* page includes links to websites of the stakeholders at FWDA including the following:

- Cibola National Forest;
- City of Gallup, New Mexico;
- DENIX;
- DoD Explosives Safety Board;
- National Association of Tribal Historic Preservation Officers;
- Navajo Nation;
- Navajo Nation Environmental Protection Agency;
- NMED;
- New Mexico State Historic Preservation Office;
- Pueblo of Zuni;
- U. S. Army Center for Health Promotion and Preventive Medicine;
- USACE, Albuquerque District;
- USACE, Fort Worth District;
- USAEC;
- U. S. Army Installation Management Agency;
- DOI;
- DOI, BIA;
- DOI, BLM;
- EPA; and
- EPA, Region 6.



The *Public Participation* page provides a description of the purpose of the RAB and lists other opportunities for public input to the cleanup process at FWDA.

The *Schedule of Events* page will list dates of activities of public interest including RAB meetings, public information meetings and tours, and deadlines for comments on documents.

The *Search Documents* page allows users to search for documents that contain a user-supplied key word or phrase.

#### **6.4 PROCEDURES**

BCT members submit documents and information for addition to the FWDA Public Website to the EIMS Manager via email or file exchange utility on the Team Web Portal. The EIMS Manager requests approval for new information from the BEC via email. The BEC notifies the EIMS Manager whether material should be posted. The EIMS Manager forwards approved website update requests to the Webmaster. The Webmaster updates the FWDA Public Website monthly.

#### **6.5 RESPONSIBILITIES**

BCT members shall be familiar with the content of the FWDA Public Website and notify the EIMS Manager when information is inaccurate or needs to be updated and when new information should be made available to the public.

The EIMS Manager shall be responsible for making all approved materials available for access from the website within 1 week of approval.

The Webmaster shall post only approved material to the website.

The BEC shall be responsible for approving all material that is available on the FDWA Public Website.

#### **6.6 SCHEDULE**

Within 1 week after approval by the BEC, the Webmaster shall delete, add, or revise material on the FDWA Public Website as directed by the EIMS Manager.

The FWDA Public Website will be updated monthly.

## 7.0 TEAM WEB PORTAL

### 7.1 OVERVIEW

A website has been created to serve as a portal to all of the FWDA environmental information. It is a password-protected website that gives those stakeholders working on the FWDA cleanup access to announcements of new information; a project contact list; a schedule of cleanup activities; an FTP site for exchanging files; a user's guide; and Web applications that allow users to search for and retrieve documents, maps, and analytical data related to FWDA. The stakeholders at FWDA need information to make decisions that affect the cleanup process. They want rapid access to the information without needing to know how to program or in what database the required information resides. Information flow for the Team Web Portal is diagrammed in Figure 7-1.

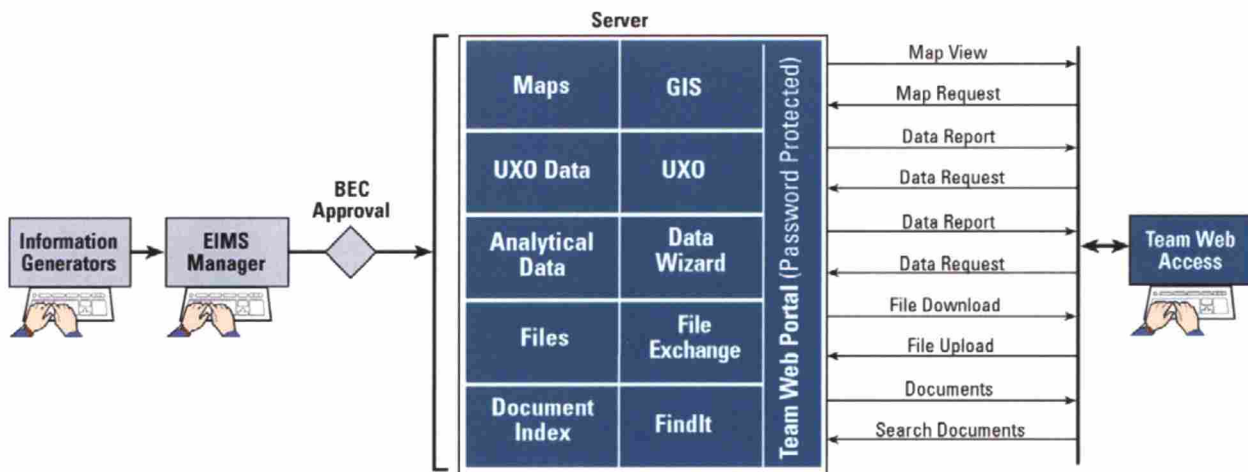


Figure 7-1. Information Flow for the Team Web Portal

Increasingly, cleanup team members need to exchange large documents, databases, and maps in electronic format. These files are sometimes too large to send via email or cause problems when multiple emails with large attachments fill up the recipient's mailbox storage capacity. By including an FTP exchange site in the team website, the EIMS facilitates the exchange of information among team members. Files can be in any format, allowing team members to make comments on the same document file, add information to the same spreadsheet, or exchange GIS map layers.

### 7.2 SYSTEM REQUIREMENTS

Following are the system requirements for the Team Web Portal:

1. The team website shall require a user identifier (ID) and password to gain access to information.
2. The team website shall provide access to a schedule of FWDA environmental activities.
3. The team website shall provide access to a contact list of FWDA stakeholders.

4. The team website shall provide an FTP site that allows FWDA stakeholders to upload and download files in any format.
5. The team website shall be capable of retrieving information from the EIMS server across the Internet to the user's PC.
6. The team website shall provide a link to an application for finding and retrieving FWDA cleanup documents.
7. The team website shall provide a link to an application for finding and retrieving FWDA cleanup analytical data.
8. The team website shall provide a link to an application for finding and retrieving FWDA UXO data.
9. The team website shall provide a link to an application for viewing FWDA map layers and retrieving information based on location.
10. Web pages configured or written for the EIMS team website shall be delivered to FWDA upon completion of the task. FWDA shall retain the right to use all such Web pages indefinitely.

### 7.3 SYSTEM DESIGN

The Team Web Portal is hosted through a secure sockets website. The portal requires the user to login with a user ID and password. Secure sockets technology encrypts the information that is transmitted across the Internet to provide additional security against intercepting or tampering with information.

The home page of the Team Web Portal displays system announcements and links to the system modules and documents. The following links are included on the home page:

1. **FDWA Public Website** – links to the [www.ftwingate.org](http://www.ftwingate.org) website, which provides general information about the cleanup program at Fort Wingate and links to stakeholders' websites.
2. **Login** – opens the EIMS Login page. This would be used to allow a different user to login to the EIMS.
3. **Home** – returns to the EIMS home page from the other EIMS modules.
4. **Documents** – provides access to the FindIt document index and allows the user to identify documents that fit user-supplied search criteria and then identify the location of the physical document or download an electronic version if available. This module also provides full text search capability for documents in electronic format. The Document Management Module will be further described in Chapter 8 of this plan.
5. **Data Wiz** – opens the Data Wizard, a module for selecting, viewing, and downloading analytical data and field measurements of environmental characterization samples from the EIMS database. The Data Management Module will be further described in Chapter 9 of this plan.
6. **GIS** – opens a module for selecting, viewing, and downloading spatial information from the EIMS database. The GIS Module will be further described in Chapter 10 of this plan.



7. **UXO** – opens a module for selecting, viewing, and downloading UXO information from the EIMS database. The UXO Module will be further described in Chapter 11 of this plan.
8. **User Manual** – allows the user to view the most recent EIMS User’s Guide or download an electronic version.
9. **Schedule** – displays the most recent schedule of cleanup activities at FWDA.
10. **Contacts** – displays a list of FWDA Project team members including their project roles and contact information.
11. **Share Files** – allows team members to upload files to the server to share with other team members.
12. **Download Shared Files** – allows one to download files that other team members have placed on the server.
13. **EIMP** – displays a Web page with links to the latest versions of the FWDA EIMP, the FWDA EIMS Infrastructure Design Document, the FWDA Deliverable Document Format Guidelines, the FWDA EIMS Electronic Data Deliverable File Specifications, and the FWDA UXO Data Deliverable Specifications.

#### 7.4 PROCEDURES

BCT members request access to the FWDA Team Web Portal from the BEC.

The BEC notifies the EIMS Manager concerning whom he has approved to access the Team Web Portal.

The EIMS Manager supplies a user ID and password to each EIMS user via email.

Each EIMS user changes his password the first time that he logs in to the Team Web Portal and agrees to follow the security guidelines.

EIMS users may access the Team Web Portal 24 hr a day 7 days a week. The portal may be unavailable for short periods of time for system maintenance.

The EIMS Manager notifies EIMS users via email in advance of any planned system unavailability.

The EIMS Manager notifies EIMS users via email when there are significant changes or additions to the information in the EIMS.

The BEC (or his designee) supplies updated announcements and schedules related to cleanup activities to the EIMS Manager.

The EIMS Manager posts updated information on the Team Web Portal.

#### 7.5 RESPONSIBILITIES

The EIMS Contractor shall develop, install, test, and maintain the software required by the FWDA Team Web Portal.

The BEC (or his designee) shall be responsible for supplying updated announcements and schedules related to cleanup team activities.

All EIMS users shall follow the following security guidelines:

1. Use secure passwords. Secure passwords are at least eight characters in length and include a mixture of upper and lower case letters, numbers, and special characters (!@#%&^\*).
2. Protect your password. Do not tell other people your password. If you write down your password, keep it in a secure place.
3. Do not upload any restricted use or classified data, documents, or maps to EIMS.
4. Use a password-protected screen saver if you leave your computer unattended.
5. Close your Web browser when you are finished working with the FWDA EIMS.

EIMS users shall report any problems that they have with the Team Web Portal to the EIMS Manager.

## **7.6 SCHEDULE**

The EIMS Manager will add new users to the EIMS within 24 hr after approval by the BEC.

The EIMS Manager will update announcements on the Team Web Portal within 24 hr after receipt from the BEC.

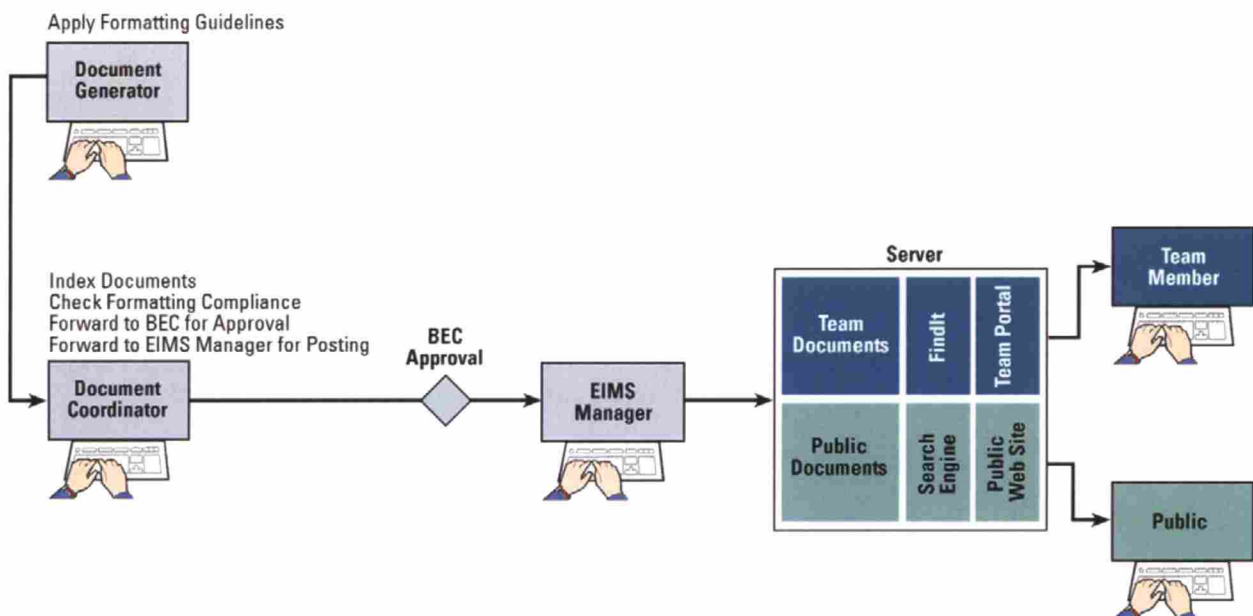
Update of other information in the EIMS will follow the schedule for the module in which it is loaded as described in the subsequent sections of this plan.



## 8.0 DOCUMENT MANAGEMENT

### 8.1 OVERVIEW

All of the FWDA stakeholders use and produce documents. Document generators are required to produce documents following standardized formatting guidelines. (Access the FWDA Deliverable Document Format Guidelines from the EIMP link on the menu bar at <https://team.ftwingate.org>.) The Document Coordinator assigned by the BEC will receive all documents, check them for compliance with the formatting guidelines, enter them in the document management index, notify the BEC of their availability, and forward them to the EIMS Manager for uploading to appropriate servers and websites (Figure 8-1).



**Figure 8-1. Information Flow for Document Management**

Most of the documents included in the FWDA Information Repository are available in electronic PDF files. The Permit requires that all new document submittals be in electronic format. The FWDA formatting guidelines have been designed to standardize the paper copy and electronic documents so that bibliographic information is readily available for easy indexing of documents and so that the electronic versions meet the accessibility guidelines required under Section 508 of the Disability Act.

The Documents Module accessible from the FWDA Team Web Portal allows the users to search for documents of interest using title, author, publication date, key words, parcels, SWMUs, AOCs, or other specified document attributes. The system identifies the names of the documents that meet the user's search criteria. The user can then view or print the document if it was available in standard electronic format. If the document is not available electronically, the system indicates the physical location of the document. The Permit requires that the Information Repository have a searchable document index.

Periodically, final documents will be uploaded to the USAEC Repository of Environmental Army Documents (READ) system on the USAEC server for permanent archive.

## 8.2 REQUIREMENTS

Following are the system requirements for the document management component of the EIMS:

1. The EIMS shall include a computer application that builds a classification index of the FWDA documents.
2. A classification scheme shall be developed for the documents. Each document shall be assigned a unique number. The following classification criteria will be used:
  - a. Title,
  - b. Author,
  - c. Receiver,
  - d. Date Issued,
  - e. Accession Number,
  - f. Document Type (report, photograph, map, etc.),
  - g. Classification (RFI Work Plan, RFI Report, Corrective Measures Work Plan, etc.),
  - h. Publication Data (internal tracking number, etc.),
  - i. Key Words (Parcel, SWMU, AOC, etc.),
  - j. Status (Draft, Final, etc.),
  - k. Public Use (Y/N),
  - l. Comment, and
  - m. Location (Building).
3. The document index database shall be maintained in an Open Database Connectivity (ODBC)-compliant format on a server accessible from the Internet.
4. The Web application shall allow the Document Coordinator to add or change document records.
5. The document database shall record the user ID of the last person who changed a document record in the database and when the change was made.
6. The document management software shall also have the option of downloading a local copy of the index database so that document searches may be performed without Internet access.
7. The document management software shall
  - a. allow the user to search for documents based on criteria for any of the fields listed in item 2 above,
  - b. return a list of documents that match the search criteria,
  - c. allow printing of the list of selected documents,
  - d. allow printing of the selection criteria, and
  - e. allow the user to view a selected document if the document is available electronically.
8. The Web interface shall require users to supply a user ID and password to add or change information or view restricted information.

9. The Web interface shall allow the user to search for documents based on text contained within the documents. Documents that are scanned as PDF images are not searchable.
10. A set of document formatting guidelines shall be developed to let document generators know what formatting is required for FWDA documents.
11. A user's guide that describes how to enter and query document information shall available on the team website.

### **8.3 SYSTEM DESIGN**

The FWDA uses the SAIC's FindIt document management software. FindIt builds an index database that can be queried to identify documents that meet the user-supplied search criteria. If the documents identified by the search are in electronic format, the query returns a link that allows the user to view or download the documents. FindIt has a Web-based application that allows searches across the Internet. It also has an access-based client application that allows the document index to be downloaded to a workstation so that the index could be searched when there is no Internet access. The FindIt is linked to the FWDA Team Web Portal.

The Document Management Module also uses the Microsoft Indexing Service to provide full text searching capabilities for documents that are available in an electronic searchable text format. The user enters a search word or phrase and the search engine returns a link to each document that contains that word or phrase. Because this search tool is a very simple and intuitive to use, it has been included on both the Team Web Portal and the FWDA Public Website. The search engine on the FDWA Public Website can access only documents that have been released to the public. The search engine on the Team Web Portal can search all documents including those not yet released to the public.

### **8.4 PROCEDURES**

#### **8.4.1 Document Generation**

Document generators prepare electronic (and paper copy when required) documents following the FWDA Deliverable Document Format Guidelines and submit them to the FWDA Document Coordinator via email or file exchange on the FWDA Team Web Portal. The Document Coordinator checks the document for compliance with the formatting guidelines and returns it to the document generator for correction if needed. If the document formatting is acceptable, the Document Coordinator enters the bibliographic information in the FindIt index and forwards the document to the BEC for review and release approval. The BEC notifies the EIMS Manager to release documents for public use or to make them available for team use only.

#### **8.4.2 Document Retrieval**

The public may access documents by following links on the FWDA Public Website to the document of interest. Clicking on the document link will open the document in Adobe Acrobat<sup>TM</sup> Reader. The public may also search for a document by entering a word or phrase on the *Search Documents* page. The search will return a list of documents that contain the word or phrase. The user can click on the document link to view the document.



FWDA team members may click on the 'Documents' link on the Team Web Portal to access the Index Search' or the 'Full Text Search.' The 'Full Text Search' functions as described for the FDWA Public Website. The 'Index Search' allows the user to search by any combination of criteria found in the FindIt bibliographic index.

#### **8.4.3 Document Archival**

The EIMS Manager will be responsible for upload of all 'Final' status documents to the USAEC READ system on the USAEC server for permanent archive at least annually.

### **8.5 RESPONSIBILITIES**

The EIMS Contractor shall develop, install, test, and maintain the software required for storing and retrieving the documents and document index information.

The FWDA BEC (or his designee) shall appoint an FWDA Document Coordinator and approving documents for inclusion in the Information Repository and for release to the public.

The Document Coordinator shall be responsible for

- developing a classification and indexing scheme for FWDA documents in coordination with the FWDA BEC (or his designee),
- checking documents for compliance with formatting guidelines,
- classifying and indexing pre-existing documents,
- classifying and indexing new documents,
- notifying the FWDA BEC (or his designee) when documents need approval for system entry and public release, and
- adding approved documents to the FWDA document index database.

The document generator shall be responsible for supplying new documents to the Document Coordinator as PDF files. PDF files shall be formatted as described in the FWDA Document Format Guidelines.

### **8.6 SCHEDULE**

The Document Coordinator shall check documents for formatting compliance, enter the bibliographic information in the FindIt index, and forward the document to the BEC for review within 1 week of receiving the document.

The EIMS Manager shall have documents posted to the appropriate website within 1 week of approval by the BEC.

The EIMS Manager shall upload all 'Final' status documents to the USAEC READ system at the end of each calendar year.

## 9.0 ENVIRONMENTAL DATA MANAGEMENT

### 9.1 OVERVIEW

The environmental data management component of the EIMS must manage several data processes. Pre-existing data must be maintained in a standardized and consolidated database. Acquisition of new data must be managed to allow sample tracking and verification and validation of results. Users must be able to view results, query desired data, and extract the results electronically for use with other analysis tools.

The FWDA EIMS uses a data management program called SEIMS (SAIC’s Environmental Information Management System). SEIMS has Web-based modules for loading and maintaining the laboratory analytical and field measurements in a SQL-Server database. Projects generating analytical data could manage it using the SEIMS modules or use another system of their choice and submit the data to the EIMS Manager in the format specified in the FWDA EIMS Electronic Data Deliverable File Specifications (accessed from the EIMP link on the menu bar at <https://team.ftwingate.org>). The BEC will approve data for public release after it has received sufficient data quality review. SEIMS has a Data Query Module called Data Wizard, which team members may access through the FWDA Team Web Portal. The Data Wizard allows users to select and view or download data. The analytical data will also be accessible through the GIS Module of the Team Web Portal. The information flow for environmental data management is diagrammed in Figure 9-1.

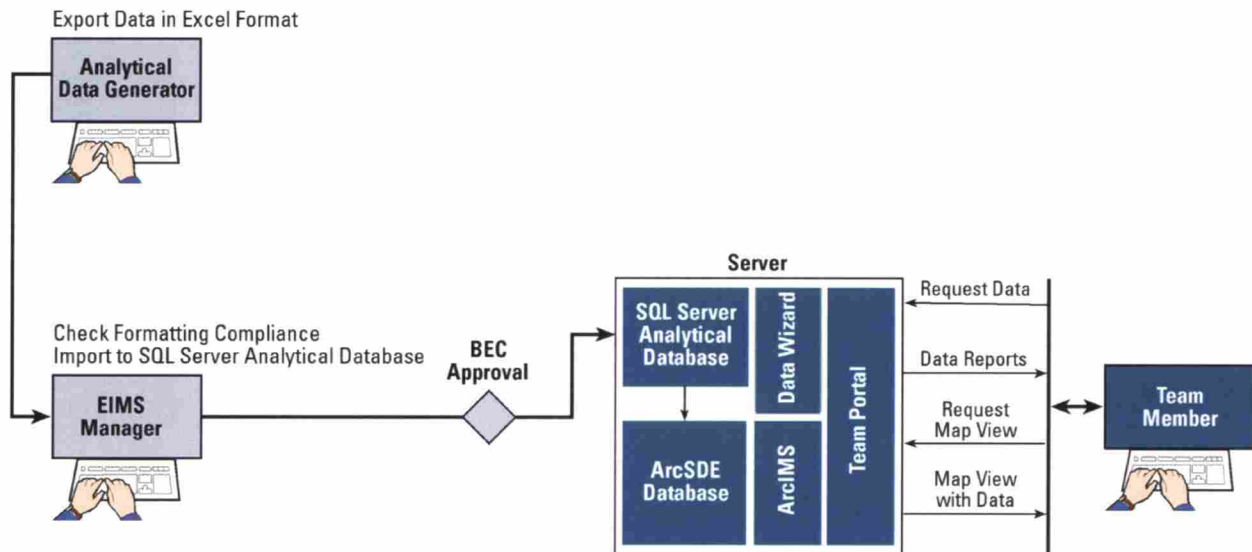


Figure 9-1. Information Flow for Analytical Data Management

Much of the historical data for FWDA is in the USAEC Environmental Restoration Information System (ERIS) database. While submitting data to ERIS is not an Army requirement for FWDA, it does provide a permanent archive for the information collected. Any analytical data not currently in ERIS may be submitted to ERIS by the Database Manager as determined by the COR and BEC.



## 9.2 SYSTEM REQUIREMENTS

The following are the system requirements for the environmental data management component of the EIMS:

1. The EIMS shall be capable of storing all of the information listed below in a database format:

### Data About Field Samples

- Sample ID,
- Date the sample was collected,
- Date the record was modified,
- Starting depth of the sample,
- Ending depth of the sample,
- Unit for depth measurements,
- Field sample type (e.g., grab or field duplicate),
- Medium from which the sample was collected,
- Project ID,
- Code for the sampling method, and
- Sampling location.

### Data About Laboratory Chemical Results

- Analysis type (e.g., volatile or semivolatiles);
- Chemical name;
- Data validator's qualifier;
- Detection limit;
- Dilution factor;
- Error associated with the measurement;
- Code indicating if the result is from a filtered sample;
- Sample ID;
- Key used to identify each sample record;
- Qualifier assigned by the laboratory;
- Code for the parameter, usually the Chemical Abstracts Service number;
- Chemical result value; and
- Units for the analytical results.

### Laboratory Analysis Information

- Sample ID;
- Analysis type (e.g., volatile or semivolatiles);
- EPA analysis level;
- ID of the associated blank;
- Date the sample was analyzed;
- Date the sample was extracted;
- Date the laboratory received the sample for analysis;
- Dilution factor;
- Sample ID assigned by the laboratory;
- Matrix of the sample analyzed, typically soil or water;
- Analytical method;
- Percent solids;
- Result type (e.g., regular, dilution, matrix spike, etc.);

Sample delivery group number; and  
Units for the analytical results.

**Spatial Information**

Name of the station,  
Station type (e.g., well, boring),  
Station's northing coordinate, and  
Station's easting coordinate.

**Project Information**

Project name,  
Contractor performing the sample collection,  
Project number, and  
Name where the site is located.

**Well Construction Data**

Name of station,  
Boring depth,  
Liner material,  
Screen type,  
Screen start depth,  
Screen end depth,  
Top of casing elevation,  
Screen material, and  
Date constructed.

**Field Measurements**

Sample ID,  
Station ID,  
Date measured,  
Parameter,  
Result, and  
Result qualifier.

2. The database shall include information to distinguish between information that has been reviewed and cleared for public release and information that has not been cleared for public release.
3. The EIMS database shall be capable of storing up to 100 million analytical or field results.
4. The EIMS shall have the capability of performing the data management functions listed below:
  - Load historical analytical data from electronic format,
  - Load field data from the electronic file,
  - Load analytical data from the laboratory electronic data deliverable (EDD),
  - Load analytical data by hand,
  - Load field measurements by hand,
  - Enter data validation flags,
  - Enter spatial information about sampling locations,
  - Print report to verify data entry,

View and print report on sampling status,  
View and print report of summary statistics, and  
Subset and extract data electronically for use with other software.

5. The EIMS shall have the capability of extracting data from the database using the following criteria:
  - Sampling project,
  - Sampling location,
  - Parcel,
  - SWMU,
  - AOC,
  - Media,
  - Collection date,
  - Sample type,
  - Analysis group, and
  - Chemical name.
6. The database must be ODBC compliant. ODBC compliance allows for the easy access of data by many types of standard commercial, off-the-shelf software database software.
7. A user ID and password must be supplied to access the data.

### 9.3 SYSTEM DESIGN

The FWDA EIMS uses the SEIMS Web pages to manage laboratory analytical data and field measurements. SEIMS includes on-line documentation to describe its structure and function.

#### 9.3.1 Database Structure

SEIMS uses a Microsoft SQL-Server database. This database system provides good security, functionality, low cost of operation and maintenance, and excellent accessibility and integration with other applications and software through ODBC. The on-line SEIMS Data Dictionary contains the structure for the environmental database system. This structure can accommodate all of the pieces of information specified in the system requirements.

The database resides on the production server at the site of the EIMS Contractor. All of the EIMS users may access the data across the Internet from different sites.

#### 9.3.2 Database Access

The use of SQL-Server software makes the database accessible to any ODBC-compliant software application. The EIMS provides two ways to access the analytical database. The Data Wizard on the Team Web Portal allows users to select data using pick lists of various data attributes and then to view or download tables of the selected data. The GIS Module allows users to select sampling locations spatially and then use the Data Wizard to further subset and download data for the selected locations.

The database has two levels of access: cleared and uncleared. A user with 'cleared' access may only view data that has gone through peer review and been cleared for public release. A user with 'uncleared' access may view all data, even data that are currently under review and subject to change.



The Team Web Portal access to the database consists of two integrated components: (1) a data query component, Data Wizard; and (2) a data management component, SEIMS. The data management component provides all functions required for data entry and field sampling. It is available only to authorized data managers. The data query is used for viewing or extracting data from the system and is available to all EIMS users.

## **9.4 PROCEDURES**

### **9.4.1 Data Management with SEIMS**

The data for a project may be managed using SEIMS from planning through reporting. To manage the data in SEIMS, the Project Data Manager requests access to the SEIMS modules from the EIMS Manager. Documentation on the SEIMS Web pages describes how to enter information into SEIMS. First, the database is pre-populated with information about the project, analyses, containers, sampling locations, and field samples. Information from the database may be used to print container labels or chain-of-custody forms. Samples are collected and sent to a laboratory for analysis. Field information and measurements are entered into SEIMS data entry screens. The laboratory returns an EDD as specified in the SEIMS on-line documentation. The Project Data Manager uploads the EDD using a SEIMS Data Loading Module. The Project Chemist validates the data and the Project Data Manager uploads the validation flags to SEIMS. The Project Data Manager notifies the EIMS Manager when the data are ready for use. The EIMS Manager requests release approval from the BEC.

### **9.4.2 Data Management with Other Systems**

The Project Data Manager may already use a data management system and not need or want to use SEIMS. In that case, the Project Data Manager collects samples and manages the data in whatever system he desires. When the data are complete, he exports the data from his system in the format specified in the FWDA EIMS Electronic Data Deliverable File Specifications, and sends it to the EIMS Manager via email or the Team Web Portal file exchange. The EIMS Manager has the data loaded into SEIMS by the SEIMS Database Manager. The EIMS Manager requests release approval from the BEC.

### **9.4.3 Loading of Pre-existing Data**

Pre-existing data, often called historical data, will need to be added to the EIMS database. The BEC requests that the EIMS Manager load data for specific projects. The EIMS Database Manager assembles the data in the format specified in the FWDA EIMS Electronic Data Deliverable File Specifications and uploads it into SEIMS. The EIMS Manager notifies the BEC when the data are available for team use.

The EIMS Operator is responsible for loading the historical data. Historical data sets are provided by the collecting contractor to FWDA in a standardized electronic deliverable format. The standard electronic deliverable format is a set of data tables that includes all of the spatial, well construction, sample, field, and analytical information for each result. The data-loading function of the environmental data management component loads these standardized files into the database.

### **9.4.4 Data and System Changes**

Suspected errors in the database shall be reported to the EIMS Database Manager, who shall contact the data generator. Database change notices shall be used to document any changes or additions to the database after the data have been validated. An electronic file of database change notices shall be



maintained and accessible as part of the system. The system shall track when records have been changed and who changed them.

Requests for changes to the structure and functioning of the EIMS database shall be made to the EIMS Database Manager. Requests shall be forwarded the BEC for review and approval. Changes to the system structure or function shall be made only after approval by the BEC. Changes shall be tested and successfully verified on a development server before being applied to the production server.

#### **9.4.5 Accessing Data via the Data Wizard**

The 'Data Wiz' link on the Team Web Portal menu bar launches the Data Wizard component of SEIMS. The Data Wizard allows BCT members to select and download analytical data and field measurements. Users select criteria from pick lists on the selection tabs and then choose a report format for downloading the information.

#### **9.4.6 Accessing Data via the GIS**

The 'GIS' link on the Team Web Portal menu bar takes BCT members to the ArcIMS™ map display panel. Users select sampling locations of interest and then use the Data Wizard to download the information.

#### **9.4.7 Archiving Data**

The EIMS Database Manager may upload the analytical data from SEIMS to ERIS after it has been approved for public release as determined by the COR and BEC.

### **9.5 RESPONSIBILITIES**

The EIMS Contractor shall develop, install, test, and maintain the software required for storing and retrieving the environmental data.

The FWDA BEC (or his designee) shall be responsible for approving data for inclusion into the EIMS.

The EIMS Database Manager shall

- convert pre-existing electronic data into the EIMS format,
- load into the EIMS standard electronic deliverables produced by data generators, and
- generate database change notices to indicate that validated data have been changed.

The data generator (contractor or support agency) collecting environmental characterization data shall

- submit electronic data in standard electronic deliverable format to the EIMS Database Manager, and
- verify and validate data collected.

**9.6 SCHEDULE**

Data collected by contractors and support agencies shall be submitted to the EIMS Database Manager as soon as possible, but no later than the submittal date of the first draft of the report associated with the data collected or as defined in the statement of work for the task.

The EIMS Database Manager shall load data into the EIMS within 1 week of the date received.

Annually, the EIMS Database Manager shall upload ERIS data that have been released for public use.

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## 10.0 SPATIAL DATA MANAGEMENT/GEOGRAPHIC INFORMATION SYSTEM

### 10.1 OVERVIEW

Spatial information is data that are most easily illustrated with a map. Spatial information includes natural and man-made features such as topography, water bodies, geologic features, buildings, roads, land use, and boundaries of political and functional areas. Spatial information may also be presented as aerial photographs. Spatial information is essential for the FWDA cleanup program for identifying areas that require remediation.

FWDA map layers are prepared in geodatabase format and imported into an ArcSDE™ database on the EIMS server when approved by the BEC. The FWDA EIMS uses ESRI ArcIMS™ for its GIS functions. EIMS users access these GIS capabilities through the Team Web Portal. The ArcIMS™ application allows EIMS users to select, view, and manipulate map layers from their Web browser. The information flow for the GIS is diagrammed in Figure 10-1.

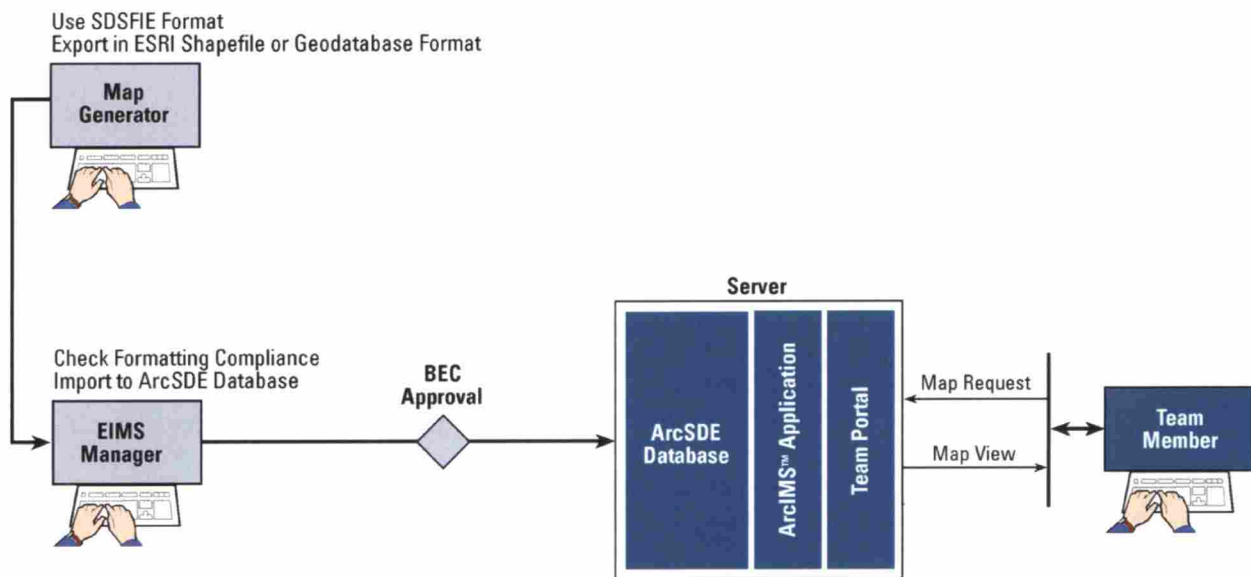


Figure 10-1. Information Flow for Spatial Data Management/GIS

### 10.2 SYSTEM REQUIREMENTS

Following are the system requirements for the spatial data management component of the EIMS:

1. The EIMS shall use ESRI ArcView™-compatible Shapefile format for storing spatial information.
2. The EIMS shall include map layers with the spatial information listed below:
  - a. site boundary;
  - b. survey monuments;
  - c. AOCs/SWMUs;



- d. parcels;
  - e. 20-ft elevation contours topography;
  - f. habitats;
  - g. wetlands;
  - h. floodplains;
  - i. vegetation;
  - j. tree line;
  - k. geology;
  - l. soil type;
  - m. seismic lines;
  - n. utilities (electric, gas, water, sanitary sewer, storm sewer, etc.);
  - o. storage tanks;
  - p. fences;
  - q. streams, creeks, and water bodies;
  - r. soils;
  - s. buildings;
  - t. railroads;
  - u. roads;
  - v. aerial photos from 1935, 1948, 1952, 1959, 1962, 1966, 1973, 1978, 1991, and 1993;
  - w. wells;
  - x. sampling locations; and
  - y. UXO locations.
3. The EIMS shall be capable of adding and modifying spatial information.
  4. Where applicable, spatial information in the EIMS shall be standardized to the Spatial Data Standard for Facilities, Infrastructure, and Environment (SDSFIE).
  5. All files shall use the Universal Transverse Mercator (UTM) North American Datum of 1983 (NAD83) Zone 12 coordinate system with units of meters.
  6. The EIMS shall include the capability for users to view spatial information, including the ability to
    - a. select the map attribute feature (layer) to view,
    - b. overlay and view multiple map layers,
    - c. prioritize layers (determine which layer is "on top of" other layers),
    - d. auto zoom to original extent,
    - e. zoom in/out,
    - f. zoom to full extent,
    - g. zoom to active layer,
    - h. zoom to last extent,
    - i. pan view, and
    - j. select view by rectangle.
  7. The EIMS shall include the capability for users to select and view data from the environmental database. Data may be selected on the map layers by
    - a. rectangle,
    - b. radius, or
    - c. polygon.

8. Data output options shall include the ability to
  - a. view or download selected data in American Standard Code for Information Interchange format,
  - b. download a GIS file of sampling points,
  - c. download a GIS file of base map,
  - d. download a graphics file of screen display, and
  - e. download a graphics file of map image onscreen.

### 10.3 SYSTEM DESIGN

The GIS information is stored in ESRI geodatabase format. The federal standard for the data fields and names of the data fields in geodatabases is the SDSFIE. FWDA map layers are standardized to this standard to make them compatible with software designed for that standard and to make it easier for GIS staff from different organizations to use these layers. ESRI Shapefiles™ may also be used to exchange map layer information.

Several different coordinate systems are used by the FWDA stakeholders. The map layers shall be projected in the UTM Zone 12 NAD83 meters coordinate system for the FWDA GIS. This is the system used by NMED. For convenience, the database may also contain coordinates in New Mexico State Plane West NAD83 feet.

Spatial information is not useful unless Metadata are available. Metadata are data that describe when, how, and why information was collected. Metadata shall be documented as part of the standardization of the spatial information.

An ArcIMS™ Web application is used to display the map layers from the Team Web Portal. ArcIMS™ allows users to view map layers while requiring only Web browser software on their workstations. The Web-based GIS allows team members to download the most up-to-date map layers to use on their GIS applications like ArcView™. The ArcIMS™ application accesses spatial information stored in an ArcSDE™ database on the server.

Map layers that identify locations of archaeological sites or include other sensitive information as determined by the COR or BEC shall have restricted distribution. Such layers shall be omitted from the Web GIS interface. Layers that include archaeological information may be distributed only to those who require that information as determined by the COR or BEC.

### 10.4 PROCEDURES

#### 10.4.1 Spatial Database Management

Spatial data are acquired from the Army and its contractors. Where appropriate, previous and ongoing projects provide spatial data files. Spatial data files shall be standardized for efficient processing of information. The GISData Manager shall check each layer received to be sure that the following processes have been performed:

- Map files shall be standardized according to the SDSFIE if applicable. This shall include, but not be limited to, the standardization of file organization and naming, colors and pen width, attribute entities, and establishment of common grid and projections.

- Metadata for all files shall be produced and maintained according to Federal Geographic Data Committee metadata standards.
- All files shall be made topologically correct.
- Files shall be converted to and stored in UTM NAD83 Zone 12 coordinate system in meters.
- BEC's approval shall be requested for addition of map layer to the EIMS.

#### **10.4.2 Data and System Changes**

Suspected errors in the map layers shall be reported to the EIMS GIS Data Manager, who shall contact the data generator. Database change notices shall be used to document any changes or additions to the database after the map layers have been approved for use in the EIMS by the BEC. An electronic file of database change notices shall be maintained and accessible as part of the system. The system shall track when records have been changed and who changed them.

Requests for changes to the structure and functioning of the GIS shall be made to the EIMS GIS Data Manager. Requests shall be forwarded the BEC for review and approval. Changes to the system structure or function shall be made only after approval by the BEC. Changes shall be tested and successfully verified on a development server before being applied to the production server.

#### **10.4.3 Accessing the GIS**

EIMS users access the map layers through the 'GIS' link on the Team Web Portal. The GIS Module allows users to

- display maps and selected environmental data,
- select both spatial and environmental data based on spatial and tabular criteria,
- use map-navigation and layer-selection tools to refine the display and to identify and locate features, and
- select spatial and tabular data for downloading.

### **10.5 RESPONSIBILITIES**

The EIMS Contractor shall develop, install, test, and maintain the software required for storing and retrieving the spatial data.

The FWDA BEC (or his designee) shall be responsible for approving map layers for inclusion into the EIMS.

The GIS Data Manager shall be responsible for

- converting pre-existing spatial data into the EIMS format,
- updating map layers when new information becomes available, and
- adding new map layers and information as requested by the BEC.

The data generators (contractors or support agencies) shall be responsible for supplying new spatial data in the specified standard format.

#### **10.6 SCHEDULE**

Pre-existing spatial layers will be distributed with the production version of the FWDA EIMS. New spatial layers will be available on the FWDA Team Web Portal within 1 month of receipt from the generating contractor.



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## 11.0 UNEXPLODED ORDNANCE DATA MANAGEMENT

### 11.1 OVERVIEW

UXO is a major concern at FWDA. Several surveys have been conducted at FWDA to locate and identify UXO. UXO may also be discovered inadvertently during fieldwork for other activities at the site. It is important to know where UXO has been found, the type found, and status of the UXO (whether it has been removed, detonated, or left in-place).

UXO is identified in the field during UXO surveys and during site safety inspections during fieldwork. UXO information is recorded in spreadsheets as specified in the FWDA UXO Data Deliverable File Specifications (accessed from the EIMP link on the menu bar at <https://team.ftwingate.org>) and is uploaded to the EIMS database. Other UXO-related information such as geophysical surveys may be recorded on map layers and incorporated into the GIS. Users may access this information through the 'UXO' link on the Team Web Portal. The information flow for the UXO data is diagrammed in Figure 11-1.

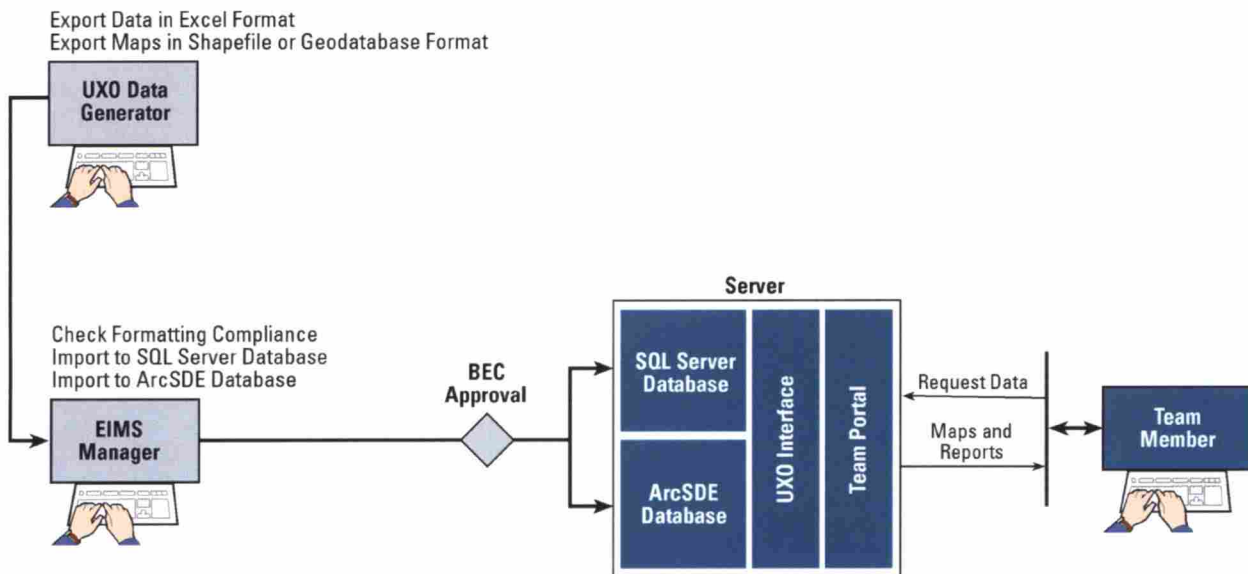


Figure 11-1. Information Flow for UXO Data Management

### 11.2 SYSTEM REQUIREMENTS

The UXO module shall have the following capabilities:

1. Store data on the location, identity, and status of UXO located in FWDA site surveys.
2. Import data of UXO characteristics from an electronic format as specified in the FWDA UXO Data Deliverable File Specifications.
3. Display UXO types and locations in the GIS layers.
4. Display mapped geophysical survey results received in ESRI ShapeFile or geodatabase format.

### **11.3 SYSTEM DESIGN**

The FWDA EIMS stores UXO information in a SQL-Server database. Web pages accessed through the 'UXO' link on the Team Web Portal allow users to select information by location and type and to view or download reports.

The GIS application allows users to display UXO locations and to download the information related to the UXO located in specific areas.

### **11.4 PROCEDURES**

UXO data generators submit data to the EIMS Manager in the format specified in the FWDA UXO Data Deliverable File Specifications. Mapped UXO information is submitted to the EIMS Manager in ESRI ShapeFile or geodatabase format using SDSFIE conventions. The EIMS Manager requests the BEC's approval for loading the UXO information to the EIMS. After approval, the EIMS Manager has the information loaded to the EIMS.

EIMS users access the UXO data by clicking on the 'UXO' link on the Team Web Portal.

### **11.5 RESPONSIBILITIES**

The EIMS Contractor shall develop, install, test, and maintain the software required for storing and retrieving the UXO data.

The FWDA BEC (or his designee) shall be responsible for approving UXO data for inclusion into the EIMS.

The EIMS Manager shall be responsible for having UXO information uploaded to the EIMS database.

The data generators (contractors or support agencies) shall be responsible for supplying UXO data in the specified standard format.

### **11.6 SCHEDULE**

New UXO information shall be available on the FWDA Team Web Portal within 1 month of receipt from the generating contractor.

## 12.0 REFERENCES

SAIC (Science Applications International Corporation) 2006. *Fort Wingate Depot Activity Environmental Information Management Needs Assessment*.

Fort Wingate Depot Activity Deliverable Document Format Guidelines, accessed at <https://team.ftwingate.org>.

Fort Wingate Depot Activity Environmental Information Management System Electronic Data Deliverable File Specifications, accessed at <https://team.ftwingate.org>.

Fort Wingate Depot Activity Environmental Information Management System Infrastructure Design Document, accessed at <https://team.ftwingate.org>.

Fort Wingate Depot Activity Unexploded Ordnance Data Deliverable Specifications, accessed at <https://team.ftwingate.org>.



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