

**U.S. Army Corps of Engineers**

**GUIDELINES AND STANDARDS  
FOR IMPLEMENTATION OF  
ELECTRONIC DOCUMENT MANAGEMENT SYSTEMS**

Web Site:

<http://www.usace.army.mil/ci/recmgmt/>

## Forward

These comments are intended to provide insight and a current awareness of ongoing activities that can affect creating a local electronic document management system (EDMS).

The major system components of an EDMS are (1) document management, (2) records management, and (3) workflow. Of these three, records management is a well understood area and has knowledge/expertise abundantly available for all aspects of managing records. Records management tends to be static with little change in its use, procedures, or application. Under these conditions, standards provided for records management (as given in this paper) can be generally expected to have long-term value.

Stability is not the case, however, for the EDMS components of document management and workflow. Advances in these two areas are dynamic, resulting in constant and continuous changes required to sustain state-of-the-art capabilities. For this reason it is difficult, if not impracticable, to publish current standards for an EDMS.

Other considerations to be taken into account before establishing a local EDMS are the significant changes currently being initiated for implementation of the Army Records Information Management System (ARIMS) Program.

The ARIMS will replace the Modern Army Recordkeeping System (MARKS) under AR 25-400-2, to be published in February 2003. The ARIMS will include a web-based set of applications and tools, new disposition standards, and Army consolidated records holding areas (RHAs) to help in the management of hardcopy and electronic records (See [www.arims.army.mil](http://www.arims.army.mil)). In addition, ARIMS web-based components will also include the Army Electronic Archives (AEA), a large-scale facility that provides for long-term, secure storage of electronic records, such as e-mail. ARIMS, programmed and Army funded through the FY2009 POM, will be available without charge to the Corps as part of the Army Records Management Program.

Under the ARIMS Program, the Army is providing consolidated RHAs for hardcopy records. A contractor operated RHA system, with storage sites at (1) Lee's Summit, MO (for unclassified records) and (2) Suitland, MD (classified records), will perform records management inventories, disposition, access, and transfer. Aforesaid RHA system services (to include records shipping and storage) are also programmed and funded through the FY2009 POM with contractor payment to be made by the Army's executor, the Records Management and Declassification Agency (RMDA). Use of the no-cost Army consolidated RHA system will be optional and is being provided gratis to discourage use of local RHAs and National Archives and Records Administration (NARA) Federal Record Centers (FRCs). Failure of the Corps to take advantage of the Army's non-cost consolidated RHAs will result in NARA FRC storage charges to be directed to USACE.

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**U.S. ARMY CORPS OF ENGINEERS  
GUIDELINES AND STANDARDS FOR IMPLEMENTATION OF  
ELECTRONIC DOCUMENT MANAGEMENT SYSTEMS (EDMS)**

## **1. INTRODUCTION.**

Why have an EDMS? Personal computers have been generating millions of documents throughout the Corps for the last 15-17 years. Documents are currently stored in a variety of recordkeeping systems on variety of media - everything from personal hard drives, to directories on servers, to paper to film, etc. While there are statutory reasons to protect and preserve Corps documentation, over and above the legal requirements is the need to differentiate among the various sources of information and their importance to the organization. Without an organized system to enable the performance of such activities, the Corps has no way of determining that information it has, when, where and how it can be accessed, and how one can discern the important from the unimportant. An EDMS allows retrieval, storage, management, and disposition of documents of all types more efficiently. Implementing EDMS will enable that Corps to meet both the legal and practical business requirements for all its documents.

**Purpose.** This document has been prepared taking into account current Corps architecture, hardware, software, and information technology practices and provides considerations/requirements that must be used for establishment of Electronic Document Management Systems (EDMS) implemented throughout the Corps.

## **2. BACKGROUND/DEFINITIONS.**

EDMS, what they are and why we need/want them: EDMSs capture documents at the beginning phase of their life cycles and display, route, store, retrieve, and disseminate those documents through the end-phase of their life cycles: destruction or transfer (archive). EDMSs are comprised of three modules working together to provide a seamless flow from one phase of the life cycle to the next. The three modules are: Document Management, Records Management, and Workflow Management.

a. Document Management (DM). Allows user to initially create a document (unstructured data), either within the EDMS, or in a different application, and save to the EDMS document repository. Documents may be input to the EDMS in different ways, usually: created and saved in the document repository originally, imported to the repository from another application, or scanned into the repository. The documents may then be checked into and out of the repository to be copied or edited. Typically, version-control mechanisms are activated to track different versions (major and minor) of the document.

b. Records Management (RM). Allows user to declare document a record and/or have tools built into the EDMS to automatically declare records, and move to a restricted repository or otherwise protect the document from alteration. Once the document is declared a record, it is

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unavailable for any changes (for legal reasons). The record may be copied, but no longer changed. (If changes need to be made, then the record is copied, changes are made, and the result is a new record.)

c. Workflow (WF) management. Once a document is created, through either structured or through use of ad-hoc processes, the document may be routed through the applicable processing required during different phases of the document's life cycle (working, collaboration, coordination, review, approval, etc.).

### **3. REFERENCES AND DIRECTIVES.**

- a. DOD Directive 5015.2, Records Management Program, 6 Mar 00.
- b. DOD 5015.2-STD, Design Criteria Standard for Electronic Records Management Software Applications, 19 Jun 02. (<http://jrtc.fhu.disa.mil/recmgt/standards.htm>)
- c. AR 25-1, The Army Information Resources Management Program, 31 May 02.
- d. AR 25-400-2, The Modern Army Recordkeeping System (MARKS) with Appendices, 1 Oct 01. (Soon to be replaced by the Army Records Information Management System (ARIMS)).
- e. ER 5-1-11, The Corps of Engineers Project Management Business Process, 17 Aug 01.
- f. ER 25-1-2, Life Cycle Management of Information Systems (LCMIS), 31 Aug 99.
- g. Functional Baseline Requirements and Data Elements for Records Management Application Software; Prescott, Kindl, and Underwood; published by Army Research Laboratory, Atlanta, GA, 28 Aug 95. ([http://jrtc.Fhu.disa.mil/recmgt/func\\_req.doc](http://jrtc.Fhu.disa.mil/recmgt/func_req.doc))
- h. Technical Report CADD-98-XX, Tri-Services Guidelines for Electronic Document Management Systems (EDMS) for Facility Management, December 1998. <http://tsc.wes.army.mil/products/edms/>
- i. Association of Information and Image Management (AIIM) ARP1-2001, Implementation Guidelines and Standards Associated with Web-Based Document Management Technologies. (<http://www.aiim.org/standards.asp?id=24488>)
- j. AIIM Standards: Integrated EDM/ERM Functional Requirements, 2003. (<http://www.aiim.org/standards.asp?id=24488>)

### **4. REQUIREMENTS FOR SYSTEM CAPABILITIES/OPERATIONS.**

a. The following requirements shall be met by any EDMS deployed within the Corps of Engineers. These are *in addition to* those listed in DoD 5015.2-STD, reference 3.b.

(1) EDMS shall include an electronic records management applications (ERMA) certified by the DoD in accordance with DoD 5015.2-STD, Design Criteria Standard for Electronic Records Management Software Applications (see Para 3.b.). This directive assumes that an organization's business processes are already defined; tacitly assumes that EDMS will be used in conjunction with ERMA's; and consequently, lists many of the functional requirements that would be standard in an EDMS. It is strongly recommended that this directive be thoroughly reviewed prior to embarking on discussions with vendors.

(2) EDMS shall be able to interface with CADD systems (including CADD EDMS) for the purpose of indexing CADD documents and, eventually, registering outputs as records (e.g., 30, 60, 90 percent reviews; bid plans; as-builts; etc.). If CADD EDMS are not used, then EDMS shall be able to accept CADD outputs, track versions, allow check-in/out of CADD documents, allow redlining, support CADD reference (or x-ref) files, be able to assign workflow(s) (broadcast, sequential, and ad-hoc), view MicroStation and AutoCAD outputs at a minimum. A thorough review of references 3.g. and 3.h. is strongly recommended.

(3) EDMS shall have capability to change fields within a database record when a change to that field within a controlling table is changed. For example, if a Project\_Number is changed within the PROJECT table, that change will populate to all data records within the system.

(4) EDMS shall use Oracle as the database engine. Oracle is the Corps standard for database development. The EDMS may need to pull or view data from existing Oracle sources and will need to utilize the standard tools available for such purposes.

(5) EDMS shall smoothly integrate and interoperate with Microsoft (MS) office suites as well as other Microsoft Windows-based programs such that documents may flow from the EDMS document repository to the MS application and vice versa; additional EDMS commands may be easily inserted to MS application menu bars; EDMS user prompts are easily set up in MS applications; toggling back and forth between EDMS and MS applications is virtually seamless; etc. Minimum platform MS Windows 2000 w/Office 97.

(6) EDMS shall interface with graphics programs, desktop publishing programs, Lotus, WordPerfect, etc.

(7) EDMS shall run on MS Windows 2000 server and PC platform (and later versions). The Corps is currently standardized on Windows 2000.

(8) EDMS shall support viewing, versioning, revisioning, and storage of compound documents, both embedded and linked. For example, a Word document with an embedded Excel spreadsheet and/or Visio drawing; or an HTML or XML document linked to an MS-Project schedule and/or an Excel spreadsheet; etc.

(9) EDMS shall be open-architecture to support a variety of applications or provide API for linking to/with various applications. While running in a Windows 2000 environment, EDMS

shall provide capability to accept, access, read, store, etc., documents/objects from other applications, e.g., scientific, engineering, construction, etc., GOTS and COTS.

(10) Storage Availability. This requirement shall be carefully negotiated with the specific Corps activity implementing an EDMS. Each activity shall inventory and specify the amount of storage space required for storing its documents, indexing metadata, and associated audit files and shall identify these needs to the vendor. At a *minimum*, system should provide for approximately 100GB of document storage and 50MB of metadata storage, over and above the space taken up by the EDMS application(s). Storage availability for both documents and metadata shall be scalable such that additional storage may be easily added as the system grows.

(11) Documentation. EDMS vendors/integrators shall provide, at a minimum, detailed step-by-step user manuals, technical manuals, and detailed documentation on all customization done, and installation and recovery procedures.

(12) Vendor/integrator shall provide USACE with all code and accompanying documentation for any customizations written for any Corps activity/organization.

(13) Training. EDMS vendor/integrator shall provide a minimum of 2-hour user training, 16-hour system-administration training (to include customizations developed or configured, data recovery, and setup), and 8-hour data manager training (to include Records Management) sessions. Corps activities may add requirements to this. If agreeable between vendor/integrator and Corps activity, a train-the-trainer approach may be used for the user training sessions. Additionally, vendor/integrator personnel shall allow Corps technical personnel to “shadow” them during the installation/setup phase(s).

(14) EDMS shall interface and work w/MS-Exchange and Outlook.

(15) EDMS shall accommodate and make use of dates and date logic as specified in Para C2.1.2., DoD 5015.2-STD (reference 3.b., above).

(16) EDMS shall be able to implement standard data (as defined in DoD 8320.1-M, Data Administration Procedures) per Para C2.1.3., DoD 5015.2-STD (reference 3.b., above). EDMS shall implement, as a minimum, data elements included in Appendix A to this document.

(17) EDMS shall be backward compatible to previous versions per Para C2.1.4, DoD 5015.2-STD (reference 3.b., above).

(18) EDMS shall meet accessibility requirements specified in Para C2.1.5, DoD 5015.2-STD (reference 3.b., above).

(19) EDMS shall provide capability for initial, mandatory document indexing data elements (see appendix A), as well as additional data elements for different categories or types of documents and when a document is declared a record. To illustrate: when a working document is initially checked into the document repository, a minimum number of data fields must be completed so document may be subsequently retrieved. If the document were a certain type of

document, for example, a regulatory permit, some additional fields would appear; if the document were immediately declared a record, yet additional fields would appear.

(20) EDMS shall provide capability to allow certain indexing elements to appear to different users based on user-ID, office symbol, document security restrictions, etc. For example, ABC office might need to see only the minimum indexing data elements or might need to see specific pull-down menus to select certain descriptive/indexing criteria. The user-ID coupled with the office symbol should trigger the proper fields to appear.

(21) EDMS shall be able to interface with and accept documents or objects from virtual-office and other collaborative-work type software applications.

(22) Input. EDMS shall be able to accept input from a minimum of sources; i.e., scanned images (raster, OCR, ICR, etc.), direct electronic import, and within or from the actual EDMS application, and shall be able to support any of these using a batch or bulk-load capability.

(23) EDMS shall accept any input, including GIS maps, CADD drawings, etc., because it must accept all authorized input as objects.

(24) EDMS shall be able to accommodate barcode technology. At a minimum, it shall be able to work with standard barcode labels used for document identification and tracking.

(25) EDMS shall have full-text search capability for electronic documents and documents that have had some form of character-recognition applied to them.

(26) EDMS shall be capable of interfacing with a variety of document imaging and workflow tools, if these are not provided from within the EDMS itself.

(27) EDMS shall provide search utilities capable of creating, modifying, or importing additional thesauri.

(28) EDMS shall have the capability to manage documents in sequential, broadcast, and ad-hoc workflows. (See also Para 4.b., above.)

(29) EDMS shall track versions and revisions of documents. Capability shall exist to determine major changes (resulting in new version number) and minor changes (resulting in a sub-decimal version number). For example, a rough draft of an environmental impact statement (EIS) might be version 1.0; subsequent changes to move chapters or correct typos, etc., might result in a minor revision, version 1.1. The Draft EIS sent out for comment to the public might be version 2.0; the final EIS incorporating all comments might be version 3.0.

(30) EDMS shall provide capability for user to immediately designate any document a "record" upon selecting "Save As" (for most Windows applications) or Send in the case of e-mail. For example, when saving a draft memo, user selects Save As and a prompt appears asking the user whether he/she wants to make this a Record (meaning, the document might require additional indexing data or not be available for changes due to being moved to the Records

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Management Module) or Working Draft (meaning, the document may still be changed, altered, re-formatted, deleted, etc.); when Sending created e-mail or closing received e-mail, the same prompt would appear requiring the user to designate the message a record or working document.

(31) In addition to other training documentation specified above, EDMS and ERMA shall have on-line help capability for user operational information. Help shall be context-sensitive to the screen from which query was launched. Global help shall be available from a hot key or menu button.

(32) Within EDMS and ERMA, shall have capability for authorized personnel (as defined by the activity) to make global changes to all fields, except those naturally restricted for security or database integrity reasons (e.g., Doc\_ID). This capability shall extend to supporting tables as well as data elements visible on-screen.

(33) EDMS and ERMA shall provide viewers such that each document may be viewed in its stored format or other human-readable rendition.

(34) Within the ERMA, records retention schedules shall be able not only to be bulk-loaded automatically, but also to automatically attach disposition instruction rules and calculate scheduled life-cycle dates. For example, when the MARKS (or ARIMS) number is assigned to the record, the disposition rule is activated and dates such as SCHEDULED DESTROY DATE, REVIEW DATE, TRANSFER TO NARA DATE, etc., are automatically calculated from those disposition rules. Neither the user nor the Records Manager should have to manually calculate and populate these date fields unless disposition rules change or records are placed under specific moratoria.

(35) Within the ERMA, when disposition rules and/or life-cycle dates are changed or need to be overwritten, Records Manager shall have access to tables to make such changes. When the disposition rule is changed, all records maintained under that rule will have their appropriate disposition dates changed automatically when the rule is updated in the table.

(36) Within ERMA, when a series of records needs to have dates edited (e.g., certain records are placed under a destruction moratorium, placed on indefinite disposition due to litigation, etc.), capability shall exist for Records Manager to identify all such records and edit the life-cycle date(s) globally, rather than record-by-record.

(37) ERMA shall have capability for authorized users to bulk-load the pre-existing records retention schedule (MARKS or ARIMS); electronic records; and document/record metadata.

(38) ERMA shall be able to accommodate barcode technology to the same extent as EDMS, but shall also accommodate indexing criteria for barcode identification and tracking of files and boxes.

(39) Based on specific criteria (e.g., user-ID and office symbol, or document-type, etc.), ERMA shall provide priority-ordered lists or directed searches of file plan components, such as

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MARKS or ARIMS numbers used by that user or office, MARKS or ARIMS numbers based on a certain document type (e.g., regulatory permit), or other such criteria to be assigned to a document or record.

(40) ERMA shall provide capability to produce hard-copy codes or identifiers in the form of labels for hard-copy documents, for labeling media, etc.

(41) ERMA shall provide capability to support records maintained in/on other media:

(a) Ability to manage boxes of records in records holding areas.

(b) Ability to manage other off-line archives, regardless of media.

(c) Ability to index and locate hard copy or other-media documents/records/objects, including any additional data elements needed for identification and management.

(42) EDMS shall run in the Corps standard Common Operating Environment.

(43) EDMS shall include report-writer capability, for example, Crystal Reports.

(44) EDMS shall interface with/through a web browser.

(45) EDMS and ERMA shall meet Corps, Army, and --as appropriate--other federal agency requirements for information privacy/assurance/security, and also be compliant with the Corps' enterprise architecture.

## 5. MANAGEMENT.

a. **General.** Planning for and implementing an EDMS is an enormous undertaking. When implemented, it will completely change the way users conduct business. Any project of this magnitude, cost, and scope requires careful, detailed planning and project management. Statutory and regulatory directives must be complied with, as well as accommodating Corps business processes and the people involved in those processes. The requirements mentioned earlier are the *minimum* that must be met to reach a successful implementation. Activities are expected to expand on these minimum requirements. As with any system deployed within the Corps, a key criterion to success is *planning*.

(1) In addition to assuring the right players are members of the planning team and the appropriate processes are followed, it's also very important that the team educate itself. One of the best methods of doing this is to conduct research: read trade journals, academic journals, etc., and talk to vendors.

(2) EDMS development shall be in accordance with ER 25-1-2, Life Cycle Management of Information Systems (LCIMS) requirements.

(3) When the planning process is completed (which must include identifying and defining the local functional/process and data requirements), it is critical that *any* vendor is carefully and exhaustively questioned about the extent of customization required to make the system work for the Corps and the *cost* of such customization. *No system on the market today will meet all Corps requirements without customization.* In other words, there is no out-of-the-box solution that will meet Corps requirements. Vendors typically recommend a company to serve as an integrator, who will customize the vendor's software perform to Corps specifications. Be aware an integrator can make or break the project. Even though the vendor may recommend a certain company, that recommendation cannot be adopted without independent research on the part of the Corps. A fully attributed and defined data or object model is critical as a starting point for allowing the vendor to understand Corps needs and how the software is expected to perform when deployed (see Appendix A for an example of this data model).

**b. How-To Planning Considerations for Implementing an EDMS.**

The following how-to considerations are provided as an adjunct to generic planning guidance. Processes may vary from activity to activity, division to division. Most divisions have a Regional Management Board and the processes already laid out by those boards need to be interpolated into these guidelines. These guidelines are by no means exhaustive, but are provided as a starting point, intended to be supplemented according to the specific needs of each activity.

(1) Prior to the beginning of any EDMS effort, interested parties should read and conduct research. The references listed in paragraph 2 should be the beginning of this research. More may easily be found on the web by keying in simple searches such as, "Content Management," "Document Management," "Enterprise Document Management," "Electronic Document Management Systems," etc.

(2) The next step is to prepare initial LCIMS documentation. (Life cycle management will be a continuous activity throughout development, start-up, and operation/maintenance of the EDMS.)

(3) Once Command approval has been obtained, a Project Manager (PM) must be assigned. The PM would normally come from either Programs and Project Management or Engineering/Construction Divisions. The PM should be experienced in all aspects of Corps project management and have the skills and clout necessary to manage a project of the scope, cost, and overall magnitude of an EDMS. It is not necessarily recommended that the PM have a technical computer or Records Management background, although he/she should be familiar with computer technology and records and terms. The EDMS project should be handled as would any other project brought into the activity (district, division, lab, etc.). The PM is critical to the success of the project.

(4) The PM, in consultation with the Chief/Director, Information Management and other senior staff, will choose a team to accomplish the project. Permanent members of the team shall be: the Records Manager, a database or other programmer from Information Management, the

CADD Manager or designated representative, and an attorney from the Office/Directorate of Counsel. Advisable to add to the team are the Electronic Bid Set (EBS) proponent and the GIS Manager. Other team members will “float” as their business processes are discussed and planned for.<sup>1</sup> It is recommended that the process proponents include higher-level knowledgeable workers as well as knowledgeable support and administrative workers. Additionally, if the process involves a field construction, HTRW, regulatory, civil works project, or other type of off-site office, key staff from those field offices should be included. Not only will this assure a complete picture of the process, but allow for staff at all levels to buy into the project.

(5) Project Delivery Team (PDT).

(a) The PDT will then draft the Project Management Plan (PMP) for presentation and final approval to the organization’s senior leadership team (see ER 5-1-11 for further information and guidance on PMPs). *Note:* may need to interpolate appropriate processes here; e.g., present to Regional Management Board. This plan will outline a detailed approach to the project. This approach can follow the phases of a project, i.e., planning, pilot, and production,<sup>2</sup> but will break down each phase into sub-phases with costs, resources, and timeframes identified.

(b) Additionally, the PDT may be part of a larger, Division-wide or regionalized EDMS project. This will enable sharing resources and ideas and result in a compatible solution for the entire division or region. Regardless, each district or activity involved shall have its own PM and PDT to assure any differences among district/activity operating principles and/or procedures are defined and considered.

(6) Suggestions for “How to Get Started.”

(a) Because of the magnitude of the project, it is strongly recommended that the team choose a single process (perhaps with some sub-processes) to map and study. The methodology used for this process should be exportable to additional processes as the project proceeds. The purpose of “starting small” is to assure that the project is on track and that all aspects of this one process have been considered and streamlined *prior* to purchasing any software or hardware to implement the new process. It is imperative that all team members and senior leadership understand that implementing an EDMS is not simply converting paper processes (many of them outdated and unnecessary) to an automated system. Existing processes must be looked at and redesigned, if necessary, to assure the implementation of the EDMS is successful and cost-effective and to assure the organization can effectively evaluate software and clearly articulate its requirements to a vendor. It is recommended that the capabilities of ARMIS be leveraged if viable.

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<sup>1</sup> The primary purpose of implementing an EDMS is to streamline and otherwise eliminate awkward or outdated processes and to define requirements based on those processes. We can then assure that the system will meet our processes rather than forcing processes to fit an ill suited automated system.

<sup>2</sup> Technical Report CADD-98-XX, Tri-Services Guidelines for Electronic Document Management Systems (EDMS) for Facility Management, p.60ff.

(b) In addition to choosing a small process or project, it's important to think about implementing in a phased approach, such as following the elements of the EDMS. These are Document Management (DM), Records Management (RM), and Workflow (WF). In addition to extensive planning, the most successful implementations of EDMS implement only one phase at a time; e.g., DM. The thought behind this type of implementation is that by implementing only one aspect of an EDMS, all the quirks can be worked out before moving to another, perhaps more complicated aspect. Again, it boils down to "starting small" (although this one aspect of EDMS is *not* considered "small") to assure the success of the overall project.

(c) As the business processes are defined and revised, documents produced during these processes shall be identified. Some will no doubt be eliminated, but some will be retained as necessary to document our business, the process workflow, or required by higher authority. As those are marked for retention, they will need to be identified as to which system or office application produces them (e.g., Travel Orders are produced by CEFMS; ENG Form 3013 by FormFlow; EISs by MS-Word/Excel/GIS (compound documents); drawings by MicroStation or AutoCAD; Purchase Orders by SPS, etc.).

(d) As these documents are identified it is advisable at the same time to conduct an inventory of existing documents. Choices must be made as to what to put into – or keep out of – the system; what records should be retained on paper and shipped to off-site records storage; and what documents and records may be purged, i.e., destroyed, outright. Conducting both efforts concurrently will allow one to influence the other and assure all possible documents are identified and planned for.

(7) Regionalized/Shared Resources Approach. Within each Division are districts or activities that are relatively small, may have experienced reduced workloads, etc. These activities will undoubtedly not be able to fund any or all of the stages necessary to achieve a successful implementation of EDMS. These activities, coupled with their Division POCs, should work with the Division to share resources. In some cases, this may involve all stages of the project; in others, they may be able to fund internal activities such as planning, but may not be able to fund consultants, hardware/software upgrades and purchases, integrators/customization; or they may not be able to afford any aspect of EDMS. In these cases, consideration should be given to sharing resources among districts/activities within the Division.

#### (8) Planning and Execution.

(a) *An important aspect of the EDMS project is the planning process.* In Congressionally authorized projects, we know this to be a fact and would not consider overlooking this aspect of the project. While the Corps is experienced in planning physical infrastructure, it has less experience planning for the more abstract infrastructure required to carry our information. It is therefore imperative that EDMS be properly planned for, including staff from all functional and business process arenas, taking the *time* needed to assure successful buy-in and deployment. When planning for physical infrastructure, the Corps must take into account the displacement of people. The same is true for the planning of internal automated infrastructure. The cultural changes are enormous in a project of this nature and must be planned

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for. EDMS will affect every employee's life in a way that no system presently used or in the planning stages has or will.

(b) Once the right players are on the team (understanding that functional/process proponents will rotate in and out as their functions/processes are discussed), it is strongly recommended that a facilitator be hired to help the activity graphically document the function/process being studied. This facilitator should be familiar with multi-level process and object oriented modeling, strategic analysis and design techniques, and have the ability to produce models and documentation based on teams discussions.

(c) The end result of the planning process should be a document containing document flow-charts, business process models for those processes studied, data or object models, and complete definitions for the above. Additionally, the document should detail the methodology used and the functional and technical requirements for any system to be selected.

(d) At this point, the team can put out a Request for Information (RFI) or Request for Proposal (RFP) (depending on contracting rules) and begin talking to vendors and researching their products in earnest. Until the functional and technical requirements are correctly identified, and define/refined, the team will not be able to determine if the vendor can truly meet the requirements or in making false assumptions and/or assurances. Without the final requirements, both the vendor community and the Corps are hurt in any discussions.

(9) If the project is well planned and executed to meet and support the EDMS's requirements, the system is likely to meet the needs of the activity. Most EDMS fail due to not determining system requirements at the outset and/or management shortfalls in business processes (includes preparation, planning, and follow-through).

c. **Implementation.** Implementation would be the Construction phase of a Congressionally authorized project or military project. The work of the PM and the PDT is not completed until the EDMS is actually running smoothly.

(1) The same team(s) used for planning should be used for piloting/testing the EDMS. The PDT will need to work very cooperatively with the vendor/integrator, as the customizations are developed to assure each one works as planned. As in a construction project, constant monitoring, testing, and evaluating are part of the process. Recommend only the PDT perform alpha testing. If alpha test is expanded at all, recommend only to selected individuals in the Information Management organization, as these users are accustomed to testing software and can provide valuable feedback. (Note that at least one IM person is a permanent member of the team in any case.)

(2) The beta testing teams may be expanded. Recommend that users testing the system be computer literate and have bought into the concept already. In addition to testing in just the process or functional area, suggest system also be beta tested in the Information Management organization.

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(3) The PDT and vendor should develop the testing criteria, together.

(4) Once tests are successfully completed, PMP should be expanded to cover an implementation scheme and schedule and make provisions for ongoing maintenance and upgrading of the system.

## **APPENDIX A**

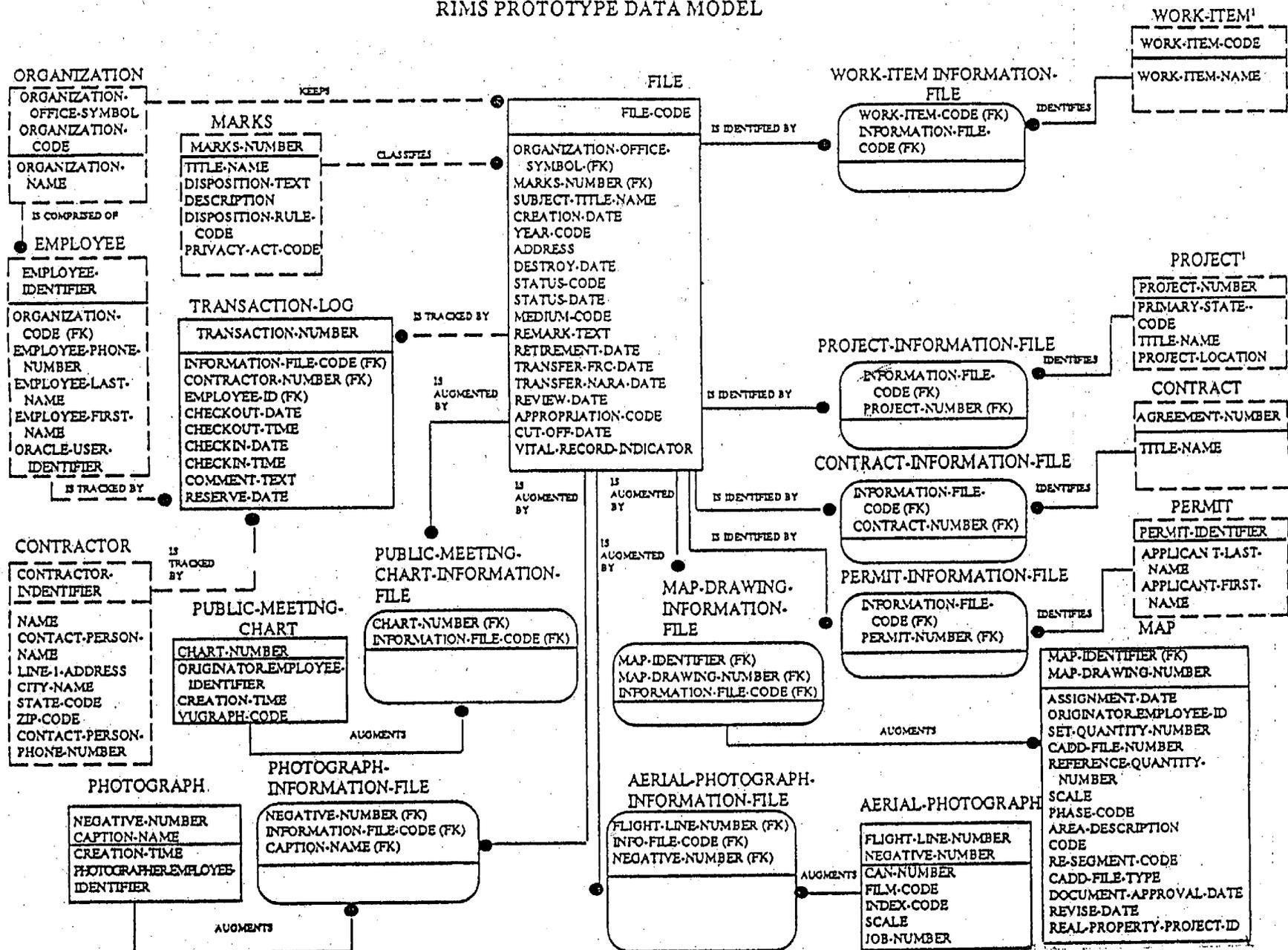
**Example of a fully attributed and defined EDMS Conceptual  
(not physical) Data/Object Model**  
(Used to show relationships within database entities)

(Next Page)

***Records Information Management System (RIMS)***

Prototype Data Model  
of  
USACE Seattle District

**USACE DISTRICT, SEATTLE  
RIMS PROTOTYPE DATA MODEL**



## APPENDIX B

### Minimum Mandatory Indexing of Data Elements for Electronic Document Management Systems and Electronic Records Management Applications

1. **Indexer-Completed.** When document is first saved into the document repository of the EDMS, the following minimum data elements (fields) shall be completed. Data elements that must be completed by the user and those which are system-generated are indicated following each data element. As much as possible, draw data from or link to existing sources and use views of the data, e.g., organization table, employee table, contract table, etc.

a. **Doc\_ID.** This is the unique identifier within the database for each document entered into the document repository (EDMS). System-generated; unique; unalterable.

b. **Doc\_Subject\_or\_Title.** If the document has a title, that would be entered or captured here. If the document were untitled, user would enter subject of document (e.g., Hydraulic data for Red River Basin). User-generated or system-captured; pick list of recently used or departmentally used (based on user\_ID and/or office-symbol) subjects or titles.

c. **Doc\_Author.** If the document's author is known, enter here. Defaults to indexer's user-ID. If author is not indexer, show pick list of employee names with ability to type in first few letters, then auto-select. If author outside organization, key in author's name. If author is unknown, select Unknown. System-generated; editable; pick list.

d. **Doc\_MARKS\_or\_ARIMS\_Number.** Select this file number from the office file plan (the office file plan will be uploaded into the ERMA). If the file number does not exist in the office's file plan, allow capability to browse through all file numbers and make selection. System-generated pick list; editable by authorized users only (e.g., Records Coordinator or Records Manager).

e. **Doc\_Date.** Date of the actual document. Defaults to current date, but indexer may change (for example, many older documents will be entered into system). System-generated; editable.

f. **Doc\_Type.** The type of document, e.g., map, drawing, specification, correspondence, etc. Users cautioned to keep list short and limit, as much as possible, to documents requiring the entering of additional data elements. For example, when user selects Correspondence, a secondary window pops up requiring user to enter in such data as Addressee, Received\_From, Received\_Date, etc. (If this is NOT e-mail. If e-mail, addressee fields will be automatically completed, per DoD 5015.2-STD.) Suggest central control of this table (i.e., users must come to the Records Manager to add a doc-type). (Some systems (e.g., *Documentum*<sup>TM</sup>) reserve the term, "document\_type." In this case, another term might be, "document\_class.") User-generated table; pick list.

g. **Doc\_Office\_Symbol.** Defaults to indexer's user-ID office symbol. If that office symbol is not correct, select from system-generated pick list. System-generated default w/pick list.

h. Doc\_Medium Identifies the medium on which the document or record is maintained, e.g., electronic (within the EDMS/ERMA), offline (tape, paper, film, etc.) or near online (on CD, DVD, etc.). Defaults to Electronic with pick list available for other media. If offline or near-online selected, prompt appears for Doc\_Storage Container\_ID.

i. Doc\_Storage\_Container\_ID. When certain medium codes are selected, this data element will appear. This allows the user to uniquely identify the near-online or offline container in which the document is stored. Barcodes, or any other technology that will allow unique identifiers to be generated, may be used. Because near online and offline storage indicates the document is not kept within the EDMS, this data element will trigger the Doc\_Location\_ID.

j. Doc\_Location\_ID. If the document/record is maintained outside of the EDMS or ERMA, physical location of the document will be entered here. This will be a pick list of locations, maintained locally, defaulting to the last-location-used. Note: since field will be triggered by Storage\_Container\_ID, this data element need not appear on indexing screen.

k. Doc\_Vital\_Record\_Indicator. Logical field that indicates whether or not document is a record needed to operate during or immediately after an emergency, and/or if the document protects the rights and interests of the Government or the public at large. Default=No. User must select Yes if document is vital. Business rules must be established to assure Vital Records are sent off-site and appropriately maintained. User-generated.

l. Doc\_Project\_No. If the document is generated as part of a project, user will select from list of office projects, i.e., project list will be limited to a user's office initially (based on user-ID); system should default to the last-project-number-used by the user; if this is a new project or outside user's organization, pick list provided of all project numbers in the table. System-generated default w/pick list.

m. Doc\_Contract\_No. If the document is related to a contract, user will select from list of office contracts, i.e., contract list will be limited to a user's office initially (based on user-ID); system should default to the last-contract-number-used by the user; if this is a new contract or outside user's organization, pick list provided of all contract numbers in the table. System-generated default w/pick list.

n. Doc\_Regulatory\_Permit\_No. If the document is related to a regulatory permit, user will select from list of regulatory permits; system should default to the last-permit-number-used by the user; if this is a new permit, authorized user shall enter in new permit number to table so data may be viewed or linked to and selected by user. System-generated default w/pick list.

o. Table 1, below lists the minimum indexing data elements with data types, whether or not field is mandatory, and suggested field sizes.

TABLE 1 – INDEXING DATA ELEMENTS

<i>Data Element Name</i>	<i>Data Type</i>	<i>Mandatory</i>	<i>Field Size</i>
DOC_AUTHOR	Alpha	Y	50
DOC_CONTRACT_NO	Alpha-Numeric	N	25
DOC_DATE	Date (4-digit yr)	Y	11
DOC_ID	Alpha-Numeric	Y	25
DOC_LOCATION_ID	Alpha-Numeric	N	5
DOC_MARKS_OR_ARIMS_NO	Alpha-Numeric	Y	25
DOC_MEDIUM	Alpha-Numeric	Y	20
DOC_OFC_SYMBOL	Alpha	Y	20
DOC_PROJECT_NO	Alpha-Numeric	N	20
DOC_REGULATORY_PERMIT_NO	Alpha-Numeric	N	25
DOC_STORAGE_CONTAINER_ID	Alpha-Numeric	N	20
DOC_SUBJECT_OR_TITLE	Alpha-Numeric	Y	255
DOC_TYPE	Alpha	N	25
DOC_VITAL_RECORD_INDICATOR	Logical	Y	1

**2. Non-Indexer Completed (either system-generated or completed by other authorized user).**

a. Doc\_Format. Identification of the originating application and version (e.g., MS-Word 97, Visio-Pro 2000, etc.). System-generated; stored in ERMA; does not need to appear on indexing screen.

b. TABLES. Several tables were identified in paragraph 1, above. As stated, strongly suggested these be views of or links to existing data as much as possible. This not only creates less work for implementers, but assures correct data entry as well. Additionally, they may be updated by other offices and simply downloaded to the EDMS/ERMA. Business rules must be in place to allow either automatic updating of these views/links, or scheduled periodic checks with the office that maintains the tables to assure the most current information is stored in or linked to the EDMS/ERMA. Below are suggestions for data elements to be maintained within or viewed by such tables. Searching the tables should be an option for users via web interface.

(1) PROJECT. An authorized project of the Corps of Engineers. Note that this will be a cumulative table. Many project files are permanent, therefore the project metadata must remain in the EDMS for search-and-retrieval purposes.

(a) Project\_No. The number assigned to a project.

(b) Project Title. The official title of a project.

(c) Project Location. The physical location of the project (e.g., Ft. Bragg, Atchafalaya River, John Day Dam, etc.).

(d) Project State. The state within which the project is located.

(2) CONTRACT. An official contract of the Corps of Engineers. Business rules must be in place to assure that the contract numbers and titles are removed at the time the contracts are actually destroyed. Note that some contracts go into litigation, prolonging the life of the contract beyond its scheduled disposition of 6 years and 3 months after final payment.

(a) Contract\_No. The number assigned to an awarded contract.

(b) Contract\_Title. The official title of the contract

(c) Contractor\_Name. The name of the contractor to whom the contract was awarded.

(3) MARKS/ARIMS. This table will be downloaded from the website and updated and maintained locally by the Records Manager (RM) from within the ERMA. Each office shall determine the numbers used by their office and forward these to the RM. The RM shall then work with the System Administrator (SA) to assure the proper numbers are assigned to the appropriate office, which will assure the pick lists in each office are correct. The RM and SA will work with the vendor/integrator to assure the proper disposition codes are applied to each MARKS/ARIMS number used within the entire activity.

(a) MARKS/ARIMS\_Number. The file number within the MARKS/ARIMS system that identifies a series of records or files.

(b) MARKS/ARIMS\_Title. The title of the file/record series, e.g., Civil Works Project Files.

(c) MARKS/ARIMS\_Disposition\_Rule. The disposition rule assigned to a MARKS/ARIMS number, e.g., K6=Keep in CFA for up to 6 years; KE6=Keep in CFA for up to 6 years following an event; T10=Transfer to RHA at any time, destroy after 10 years; etc.

(d) MARKS/ARIMS\_Disposition\_Code. Corps of Engineers business rules dictate that the disposition rules be further refined into codes, e.g., the rule K6 may be assigned a code of R2 by the Records Manager in the EDMS, indicating that the office should review the records/files after 2 years to determine whether the business process allows them to destroy these files earlier than 6 years (K6). These rules are assigned and updated by the RM only.

(4) EMPLOYEE. Lists employees assigned to the organization.

(a) Employee\_LName. Last name of the employee.

- (b) Employee\_FName. First name of the employee. (May want to concatenate within the table into an Employee\_Name field sorted by Employee\_LName.)
- (c) Employee\_Organization\_Office\_Symbol. The office symbol of the employing organization. This would probably be imported as a foreign key from the Organization table.
- (d) Employee\_User\_ID. UPASS Administrator would maintain this information and provide to SA to import.

(5) ORGANIZATION. Lists organizations within the activity. This table would be similar to the Project table in that organization names and office symbols vary over time, so all names and office symbols must be retained in order to reconstruct document ownership over time.

- (a) Organization\_Name. The official name of the organization, e.g., Environmental Resources Section.
- (b) Organization\_Office\_Symbol. A unique code assigned by the Records Manager to identify each organization hierarchically within the activity. For example, organization above might look like CENWS-PM-PL-ER.

(6) MEDIUM. The medium on which the document is stored.

- (a) Medium\_Code. The code for the type of medium below.
  - (i) E=Electronic. Document is stored within the EDMS/ERMA or in an electronic application.
  - (ii) N=Near-online. Document is stored on a disk of some sort: CD, DVD, hard disk, etc. Triggers Storage\_Container\_ID (identify disk number, shelf code, etc., see below).
  - (iii) O=Offline. Document is stored on any type of medium, but is physically located off-site. Examples: Paper, film (aerial photos, flat photos, slides, microfilm), tape (audio, video, backup), etc. Triggers Storage\_Container\_ID (identify box number, bin number, etc., see below).

(7) STORAGE\_CONTAINER. The container for any kind of near-online or offline document.

- (a) Storage\_Container\_ID. A unique identifier for each storage container. May be a barcode number or any other easily generated unique identifier. Entering this ID triggers Location\_ID.
- (b) Storage\_Container\_Type. The type of document storage container, such as jewel box, jukebox, bin, shelf, map box, records box, etc.

(8) LOCATION. Where the document is physically located, if not electronic and/or retained within the EDMS/ERMA. Triggered by Storage\_Container\_ID. Maintained by RM and SA.

- (a) Location\_ID. A unique identifier for each different location where documents are stored. For example, an off-site commercial or Government vault, a commercial records center, the Army Regional Records Center, the Federal Records Center, the National Archives, etc.
- (b) Street\_Address1. The street address of the location where the document is physically located.
- (c) Street\_Address2. Additional space for a street address.
- (d) PO\_Box. Mailing address of the location where the document is physically located (use only if different from the street address).
- (e) City. The name of the city of the location where the document is physically located.
- (f) State. The name of the state of the city of the location where the document is physically located.
- (g) Zip-Code1. The 9-digit postal zip code of the street address of the location where the document is physically located.
- (h) Zip\_Code2. The 9-digit postal zip code of the mailing address of the location where the document is physically located (use only if different from the street address).

(9) REGULATORY\_PERMIT.

- (a) Permit\_No. The unique tracking number assigned to a permit application.
- (b) Permit\_Applicant\_Name. The name of the applicant(s) – may be an individual citizen(s) or organization(s).
- (c) Permit\_Waterway\_Name. The body of water or geographic location of a wetland or other geographic locator associated with the permit application.

c. Table 2, below, shows all the non-indexer data elements (not including those which should already exist within the EDMS, per DoD 5015.2-STD) and, if a data element belongs to a specific table, whether it is mandatory within the table or not. Additionally, the Data Element Name indicates with “(K)” when the data element is a key element within the database table. Note: these are suggested tables provided only to assure all non-DoD, non-indexer data elements are included. There may be more efficient ways to actually program the system than creating tables, views, or even links to these data.

TABLE 2 – NON-INDEXING AND TABLE DATA ELEMENTS

<i>Data Element Name</i>	<i>Table Name</i>	<i>Data Type</i>	<i>Mandatory</i>	<i>Field Size</i>
CONTRACT_NO (K)	CONTRACT	Alpha-Numeric	Y	20
CONTRACT_TITLE	CONTRACT	Alpha	Y	255
CONTRACTOR_NAME	CONTRACT	Alpha	Y	150
DOC_FORMAT	DOCUMENT	Alpha-Numeric	Y	25
EMPLOYEE_FNAME	EMPLOYEE	Alpha	Y	25
EMPLOYEE_LNAME	EMPLOYEE	Alpha	Y	25
EMPLOYEE_ORGANIZATION_ OFC_SYMBOL	EMPLOYEE (FK)	Alpha-Numeric	Y	20
EMPLOYEE_USER_ID (K)	EMPLOYEE	Alpha-Numeric	Y	10
LOCATION_CITY	LOCATION	Alpha	Y	20
LOCATION_ID (K)	LOCATION	Alpha-Numeric	Y	5
LOCATION_PO_BOX	LOCATION	Alpha-Numeric	N	10
LOCATION_STATE	LOCATION	Alpha	Y	2
LOCATION_STREET_ADDRESS_1	LOCATION	Alpha-Numeric	Y	25
LOCATION_STREET_ADDRESS_2	LOCATION	Alpha-Numeric	N	25
LOCATION_ZIP_CODE_1	LOCATION	Alpha-Numeric	Y	10
LOCATION_ZIP_CODE_2	LOCATION	Alpha-Numeric	N	10
MARKS_ARIMS_ DISPOSITION_CODE (K)	MARKS_ARIMS_ DISPOSITION	Alpha-Numeric	Y	5
MARKS_ARIMS_ DISPOSITION_RULE	MARKS_ARIMS_ DISPOSITION	Alpha-Numeric	Y	50
MARKS_ARIMS_NO (K)	MARKS_ARIMS	Alpha-Numeric	Y	25
MARKS_ARIMS_TITLE	MARKS_ARIMS	Alpha	Y	80
MEDIUM_CODE (K)	MEDIUM	Alpha-Numeric	Y	5
MEDIUM_TYPE	MEDIUM	Alpha	Y	20
ORGANIZATION_NAME	ORGANIZATION	Alpha-Numeric	Y	35

<i>Data Element Name</i>	<i>Table Name</i>	<i>Data Type</i>	<i>Mandatory</i>	<i>Field Size</i>
ORGANIZATION_ OFC_SYMBOL (K)	ORGANIZATION	Alpha- Numeric	Y	20
PROJECT_LOCATION	PROJECT	Alpha	Y	50
PROJECT_NO (K)	PROJECT	Alpha- Numeric	Y	20
PROJECT_STATE	PROJECT	Alpha	N	2
PROJECT_TITLE	PROJECT	Alpha	Y	255
REGULATORY_PERMIT_ APPLICANT_NAME	REGULATORY_ PERMIT	Alpha	Y	50
REGULATORY_PERMIT_NO (K)	REGULATORY_ PERMIT	Alpha- Numeric	Y	25
REGULATORY_PERMIT_ WATERWAY_NAME	REGULATORY_ PERMIT	Alpha- Numeric	Y	35
STORAGE_CONTAINER_ID (K)	STORAGE_ CONTAINER	Alpha- Numeric	Y	20
STORAGE_CONTAINER_TYPE	STORAGE_ CONTAINER	Alpha- Numeric	Y	20