Resource Conservation and Recovery Act (RCRA)
E-Permitting Functional Requirements
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1.0 INTRODUCTION

The U.S. EPA's RCRA Hazardous Waste Program is investigating the feasibility of electronic permitting (e-permitting) to better assist states in improving their RCRA permitting programs. The RCRA E-Permitting System envisioned by EPA is an electronic system that will improve the effectiveness and efficiency of the RCRA permitting program. Goals of a RCRA E-Permitting System include:

- Improving the timeliness and efficiency for processing and issuing permits;
- Expanding public participation opportunities by providing the public with easy access to permitting documents, such as via websites;
- Facilitating data sharing among federal and state agencies; and
- Moving towards a paperless system by reducing the amount of paper submitted in an application, hence saving resources.

This document presents requirements for a RCRA E-Permitting system that:

- Allows facilities to prepare and submit applications on line;
- Receives and uploads RCRA-related information from facilities located anywhere in the USA;
- Monitors and facilitates the RCRA permitting process for State environmental staff;
- Assists in the drafting of permits based on the data submitted by the facilities;
- Links to other environmental data regulatory systems (allowing facilities to move towards "one-stop shopping" in applying for the permits they need); and,
- Can be implemented by individual States one piece at a time.

These requirements are based upon an analysis of e-permitting systems at the Mississippi Department of Environmental Quality (MDEQ), New York State Department of Environmental Conservation (NYSDEC), and Texas Council of Environmental Quality (TCEQ). Additional information was obtained through consultations with EPA, states, industry, and NGO representatives. The *E-Permitting System Capability and Implementation Issues Report*, MNG Center, SRA International, February 12, 2003, (E-Permitting Report) is the basis for the requirements described in this document. More specifically, the approach for developing the requirements included:

- Developing a diagram depicting the RCRA business process (see Section 2 for detailed discussion); and
- Defining technological best practices used by state e-permitting systems (through the state visits) to enhance the RCRA permitting business process (hereafter the *business process*).

Given the need of some states to design and build e-permitting systems incrementally, this requirements document has been developed in a modular fashion. For example, if a state's short-term objective was to facilitate on-line permit application completion and submittal and if another sought a means for tracking permitting status activities, both could build the modules appropriate to their needs. Such a flexible approach enables states to build additional modules as appropriate, and acknowledges the reality that while some states are interested in designing free

standing RCRA systems; the prevailing trend is to add new functionality (e.g., RCRA modules) to their existing multi-media systems to foster a facility-wide approach.

This requirements document is organized into the following sections:

- Section 2, Description of Business Process
- Section 3, Requirements
- Section 4, Entity Relationship Diagram
- Appendix A, Business Process for RCRA Permitting
- Appendix B, RCRA Permitting Process: Functions, Sub-functions, and Best Practices
- Appendix C, Summary of Requirement Types
- Appendix D, Entity Relationship Diagram

2.0 Description of Business Process – RCRA

Appendix A presents the business process for RCRA permitting. This process is based on EPA and state requirements for notification of intent by an applicant to apply for a permit through issuance of a final permit by the agency. The process reflects how an agency conducts its RCRA permitting activities and summarizes the steps an applicant must take to receive a final permit. Renewals typically follow the same process as new applications. Seven major functions represent the business process. Each function is a major action that occurs within the permitting process. Functions for the business process are as follows:

- Notification (1.0) – The applicant notifies the agency of its intent to apply for a permit, or to modify or renew an existing permit. After the agency receives notification, the agency checks the facility's compliance history to determine whether the facility has any violations or other relevant issues.

- Pre-Application Meeting (2.0) – The applicant has a pre-application meeting with the public and provides the agency with a meeting summary, list of attendees, and comments. The agency prepares a public mailing list to support public participation during the RCRA permitting process.

- Preparation of Application (3.0) – The applicant prepares its application either electronically or in paper copy and submits it to the agency.

- Receiving Application (4.0) – Receipt of the application officially starts the agency's role in the permitting process. Activities include:
  - Issuing the applicant a letter acknowledging receipt of the application;
  - Notification of the public via newspaper public notice and agency website;
  - Reviewing the application for completeness and technical accuracy;
  - Resolving all application deficiencies; and
  - Issuing the applicant a notice of completeness letter.

- Draft Permit (5.0) – The agency decides whether or not to draft the permit. If the agency decides to draft the permit, the permit writer does so based on the application and applicable regulations. When the permit writer completes the permit and it has been reviewed internally, it is sent as a preliminary permit to the facility for comments.

- Public Participation (6.0) – Public participation begins when the agency receives the application. The agency makes the application available to the public for review. The agency invites the public to review and comment on the draft permit through the public notice. Based on the public comments, the agency may determine to hold a public hearing.

- Final Permit Decision (7.0) – The agency prepares the final permit based on all relevant information obtained during the permitting process. The appropriate agency official signs the permit and the final permit is transmitted to the facility. After issuance of the final permit, the agency allows a 30-day permit appeal period.

Appendix B presents a list of the functions, sub-functions, and best practices. The functions and sub functions provide a description of each process box found in the business process diagram. The best practices were identified during the visits to the MDEQ, NYSDEC, and the TCEQ. The majority of the practices are aided by electronic technology; however, there are at least two that are conducted solely by individuals. These two practices are submitting an application with confidential business information (CBI) and technical review of the permit application. Typically, an application containing CBI is submitted as a paper copy, and there are common policies for handling CBI material. Once the application is deemed complete, (i.e., all appropriate sections were responded to by the applicant) the permit writer will conduct a technical evaluation of the application. The type and volume of hazardous waste determines the type and volume of containment needed, the waste handling and management practices to be followed for storage, treatment, or disposal, and requirements for inspections, contingency planning, and closure.

3.0 REQUIREMENTS

This section introduces the requirements for an e-permitting system and includes the following:

- Types of Requirements (3.1) - The e-permitting system will need specific ways to input, validate and store data, provide access to stored data, generate formalized output and messages, and ensure security. This section describes what each type of requirement entails.

- Functional Requirements (3.2) - For each function and sub-function in the business process, this table--at the heart of the document--shows which data elements and requirement types will be needed.

- Defining RCRA E-Permitting Data (3.3) - This subsection presents a list of data standards that have been established by the EPA.

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3.1 Types of Requirements

A requirement type is an entity that does a given, finite, and defined piece of work. The requirements are organized for data collection and dissemination purposes. That is:

- Each requirement type must stand alone and be of use in defining one part of the job to be done to provide the functionality needed for a particular numbered work process phase; and,
- Each requirement type may be of use for more than one such phase.

Nine different requirement types have been established. Requirement types are the same across functional requirements. For example, the Facility Status Report, Mailing List, and Permit are all "Reports" although they each serve a different functional purpose. A description of the nine types of requirements follow:

Functional Requirement Type	Description	Comment
Access	Provides an interface with simultaneous Boolean search capabilities on several fields, a screen to view and sort results, and the ability to print out results to paper save to an electronic file. May include ad-hoc report generation.	Web-enabled or system-wide
Alert	System-generated message	Pop-up or email
Data Upload	System uploads data electronically, pulling from data entry forms ▪ Performs virus check on the incoming data file ▪ Runs clean-up macros to eliminate any stray codes and places data in a format for loading into the system ▪ Loads data into the database when the form data is free from errors ▪ May include daily replication of the database to provide a layer of security between live updates and proven data (data is transferred from a user input holding file to the main data storage facility nightly.) ▪ OR System uploads from paper copy ▪ Scans the application ▪ Converts the form data to a format that can be directly loaded into the system ▪ Runs clean-up macros on the data ▪ Loads the data directly into the system	
Interactive Form	Data entry form with menu-driven fields (i.e., pick lists available as drop-downs to limit responses to valid answers), with built-in validation logic to compare answers across fields (e.g., restricting volume measurements to those appropriate to substance type), ▪ Downloads fill-in forms. Form may be saved on a PC for completion at a later time, and then uploaded or emailed ▪ Submits electronically, via paper copy, CD, or diskette	Web-enabled or system-wide Data from the forms must meet incorporated validation standards

	▪ Optionally, an extra step comprising affirmation by the user that data as entered is correct and/or authorized. This step requires an additional password or electronic signature. ▪ Feedback to the user upon submittal of the form consists of the data that has been entered, tags used to identify the data, user identification, data source (e.g. IP address), and confirmation of receipt	
Reference Table	Presents stable information used as a lookup – updated only by system administrators	Web-published or system-wide
Report	Presents information in a set format, either on a screen or as printout, may include a "letter builder" to incorporate data into a pre-formatted template, or use query language and/or a reports builder or other report builders to assemble data	May allow user a choice of ways to sort contents
Security Procedure	Provides: ▪ User identification ▪ Login controls ▪ User roles (each "role" provides read-only or read/write access to a portion of the data in the system) ▪ Tracking for login activity (time & date of login/logout) ▪ User-directed check on access ▪ Audit trails, including date stamp and user ID for each change or update ▪ Electronic signature verification (cross check of user identity against recorded electronic signature) ▪ Participation Agreement (to make electronic signature legally binding) ▪ Validation of compliance with participation agreement	
Web Site Page	Provides information, instructions, and links	
Workflow Calendar	Provides a timeline for each permit	

3.2 Functional Requirements

The following table presents the requirements and data for each of the RCRA E-Permitting functions and sub-functions shown in Appendix B and described in Section 2. Requirement functions and sub-functions are numbered to match the business process diagram, data requirements are summarized and grouped by the nature of the data, and the requirement are indicated by type, assigned an uppercase letter and a name, and described.

These requirements provide a preliminary blueprint, showing the various components that a RCRA E-Permitting system needs, and are not intended to be a comprehensive system design tool. Such a tool would need to be more detailed, more rigorous, and, most importantly, carefully tailored to the actual on-the-ground practices of the regulating entity who is to use it. However, these requirements provide a valid roadmap regarding the scope of work to be done, and allow for many ways to divide it to facilitate a module-by-module approach.

Function /SubFunction	Functional Requirement	Data Summary
1.0 Notification		
1.1 Facility notifies agency of intent to apply for permit	***Access A: Facility Search Screen*** Allows search by facility ID, name, location, and contact ***Report A: Facility History*** Allows state agency staff to see what permits have been issued for the facility, their beginning and end dates, and compliance information ***Reference Table A: Permit Type*** Shows parameters for each type of permit issued ***Web Site Page A: How to Apply for a Permit*** Provides instructions for contacting state agency staff and for applying for a permit. References applicable law. States who must apply and conditions. ***Security Procedure A: Setup User Login***	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Applicable Law Facility history (past permits, compliance) Permit Status
0.2 Facility notifies agency of intent to renew permit	***Access A: Facility Search Screen*** Allows search by facility ID, name, location, and contact ***Access B: Permit Search Screen*** Allows state agency staff to find a permit by type of permit, date issued, and facility to which it was issued ***Interactive Form B: Permit Renewal Request Form*** Provides access for facility to enter all necessary information for renewal of a current permit online and submit it. Submission triggers automatic update of Permit Status ***Report A: Facility History*** Allows state agency staff to see what permits have been issued for the facility, their beginning and end dates, and compliance information ***Alert A: New Request Notice*** Upon submission, email goes to the designated state agency contact to alert staff of new work to process, and references the type of request, the requestor, the type of permit and the date of the request	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Permit Status

Function /SubFunction	Functional Requirement	Data Summary
1.2 Facility prepares notification form AND 1.3 Facility submits notification form to agency	***Access A: Facility Search Screen*** Allows search by facility ID, name, location, and contact ***Interactive Form C: New Permit Notification Form*** Assigns facility identification and permit identification numbers, and correlates new entries with previous data about the facility, if it already is being tracked. Provides access for facility to enter all necessary information online for notification of intent to apply for a permit and submit it. Submission triggers automatic update of Permit Status (e.g., from new permit to permit modification or permit renewal.) ***Alert A: New Request Notice*** Upon submission, email goes to the designated state agency contact to alert staff of new work to process, and references the type of request, the requestor, the type of permit and the date of the request ***Alert B: First Receipt*** Upon submission, email goes to the facility confirming receipt of notification form and providing facility and permit identification numbers and user login and password information	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Permit History/Date of permit notification
1.4 Agency receives notification form (including 1.4.1 Agency processes notification form)	***Access A: Facility Search Screen*** Allows search by facility ID, name, location, and contact ***Access C: Case Assignment Screen*** Allows designated state agency contact or administrator to assign the request for renewal, modification, or new permit to agency staff, Or, Allows agency staff to assign themselves to a request by checking it out. ***Alert C: Case Assignment Notice*** Email goes out from Agency contact to assign the request to staff designated to respond to the request ***Data Upload A: Upload Application*** Checks the master file to determine if the facility is already in system, & updates the information, if appropriate.	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Permit History/Date of permit notification
1.5 Agency checks compliance history	***Access A: Facility Search Screen*** Allows search by facility ID, name, location, and contact ***Report A: Facility History*** Allows state agency staff to see what permits have been issued for the facility, their beginning and end dates, and compliance information	Facility Identifiers (ID, Name, Address, Location, Contact) Permit History
2.0 Pre-Application Meeting		
2.1 Facility has pre-application meeting	***Web Site Page B: Pre-Application Meeting*** Posts meeting announcement on website, including date, time, place, and agenda ***Report B: Facility Status*** Shows facility identifiers, status of permit application within the process	Facility Identifiers (ID, Name, Address, Location, Contact) Permit History

Function /SubFunction	Functional Requirement	Data Summary
2.2 Facility provides agency with meeting summary, list of attendees & written comments	***Web Site Page B: Pre-Application Meeting*** Posts meeting summary, list of attendees and written comments	
2.3 Agency prepares public mailing list	***Report C: Mailing List*** Lists names, addresses, and e-mail addresses of public entities to be notified of permit application	Mailing list

3.0 Preparation for Application		
3.1 Facility prepares application	***Web Site Page C: Application Instructions*** Instructions on how to complete the application ***Interactive Form D: Application Part A*** Allows user to insert facility data directly into the form, and automatically verifies, reformats, & calculates data as it is filled in. If certain user information (such as facility identification) is already in the system, it pre-populates applicable fields. It provides a way to include attachments such as maps and photographs as "blobs" ***Interactive Form E: Application Part B*** Pre-populates using data acquired with Application Part A. Allows user to insert facility and waste data directly into the form, and automatically verifies, reformats, & calculates data as it is filled in. If certain user information (such as facility identification) is already in the system, it pre-populates applicable fields. It provides a way to include attachments such as maps and photographs as "blobs," and attachments such as reports and tables as readable text. ***Reference Tables*: (**one for each type of waste storage or disposal listed in the permit) Instructions and table layout for information to be entered	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Applicable Law Waste Management Unit Checklist (Unit, Unit #, Status, Design Capacity, Years Used, Date in Service) Registration tie-in Attachments (Attachment Type, Attachment blob, Electronic Signature) Facility Description (type of hazardous waste management, critical location factors, wastewater disposition, adjacent landowners, siting criteria, additional requirements, emergency data, etc.) Inspection Schedule Arrangements with Local Authorities Waste (type, source, volume, code, sampling) Storage(types. Areas. Capacity, hazard type, operating conditions, etc.) Geology and Topography Closure Plans Finances Licensing Fees
3.2 Facility submits application	**Interactive Form F: Submission** Allows applicant to demonstrate his/her intent and authorization by entering his/her password and then pressing the submit button Popup displays confirmation of the data submission including the confirmation number and hash code ***Alert B: First Receipt*** (Needed only if the functional requirement for notification (Requirement row #1.4) is not included) Upon submission, email goes to the facility confirming receipt of notification form and providing facility and permit identification numbers and user login and password information	Submission (IDs, submitter, IP address of submitter, confirmation codes) Application Copy Of Record (COR)

4.0 Receiving Application		
4.1 Agency receives application including 4.1 Agency Processes Application AND 4.1.2 Agency establishes public participation schedules	***Alert D: Application Receipt Notice*** Email or popup alerts state facility staff previously assigned to case of the arrival of the permit application. ***Data Upload A: Upload Application*** Checks the master file to determine if the facility is already in system, & updates the information, if appropriate. (Needed only if the functional requirement for notification (Requirement row #1.4) is not included) ***Report D: Public Participation Schedule*** Generates a schedule based on standard permit calendar and Business Processes	Permit Status Permit Calendar Business Process Functions
4.2 Agency issues letter acknowledging receipt of application	***Report E: Confirmation of Application Receipt*** Uses a "letter builder" to incorporate data about the facility into a pre-formatted template	All facility-centric data elements
4.3Agency conducts completeness review	***Report G: Application Discrepancies*** Applies logic to: Determine applicability of federal/state rules and to categorize individual requirements (standards, monitoring, recordkeeping, and reporting) and Determine applicable requirements based on specific sets of operating conditions for an individual unit… AND Applies logic based on type of hazardous waste. For each type, checks application section requirements For appropriate measurement (e.g., liquid waste may require liters, gallons, barrels, etc.) For appropriate storage container type For appropriate storage practices For safe storage requirements… …to the permit application and generate a report that highlights discrepancies and or missing data in the application. (The tool creates a profile application using the information that describes the facility, checks data as entered against the profile, highlights any items on the profile that are missing, incomplete, or have non-responsive data in the application, and organizes the findings by application section in an easy-to-retrieve format.) Additionally supplies comment area for special site-specific, geologic, topographical, or other considerations. ***Data Upload B: Correct Application*** Update and correct permit application based on reported discrepancies	All facility-centric data elements

4.4 Agency determines if application is complete?		
4.5 Agency contacts facility for additional information	***Report F: Request for Additional Information*** Uses a "letter builder" to incorporate data about the facility into a pre-formatted template	All facility-centric data elements
4.6 Facility submits additional information	***Interactive Form D: Application Part A*** Allows user to insert additional facility data directly into the form, and automatically verifies, reformats, & calculates data as it is filled in. If certain user information (such as facility identification) is already in the system, it pre-populates applicable fields. It provides a way to include attachments such as maps and photographs as "blobs" ***Interactive Form E: Application Part B*** Pre-populates using data acquired with Application Part A and previously entered information from Part B. Allows user to insert facility and waste data directly into the form, and automatically verifies, reformats, & calculates data as it is filled in. If certain user information (such as facility identification) is already in the system, it pre-populates applicable fields. It provides a way to include attachments such as maps and photographs as "blobs," and attachments such as reports and tables as readable text. ***Security Procedure B: Check on logon activity*** Whenever the applicant logs into the system, the system displays the date and time of the most recent logons, the applicant must declare that all of those logons were his/hers or admit that they were not his/hers (If the logon was not conducted by the applicant, the account is disabled and the applicant must contact the help line) ***Data Upload C: Supplemental Information for Application*** Update and correct permit application based on reported discrepancies	

4.7 Agency conducts technical review	***Report G: Application Discrepancies*** Applies logic to: Determine applicability of federal/state rules and to categorize individual requirements (standards, monitoring, recordkeeping, and reporting) and Determine applicable requirements based on specific sets of operating conditions for an individual unit… AND Applies logic based on type of hazardous waste. For each type, checks application section requirements For appropriate measurement (e.g., liquid waste may require liters, gallons, barrels, etc.) For appropriate storage container type For appropriate storage practices For safe storage requirements… …to the permit application and generate a report that highlights discrepancies and or missing data in the application. (The tool creates a profile application using the information that describes the facility, checks data as entered against the profile, highlights any items on the profile that are missing, incomplete, or have non-responsive data in the application, and organizes the findings by application section in an easy-to-retrieve format.) Additionally supplies comment area for special site-specific, geologic, topographical, or other considerations.	All facility-centric data elements

4.8 Agency determines if application is technically acceptable?		
4.9 Agency issues notice of completeness letter	***Report H: Notice of Completeness*** Uses a "letter builder" to incorporate data about the applying facility into a pre-formatted template	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Permit Status
4.10 Agency requests additional information	***Report I: Request for Additional Information*** Uses a "letter builder" to incorporate data about the applying facility into a pre-formatted template	All facility-centric data elements
4.11 Facility submits additional information	NOTE: Same as 4.6, please see above.	All facility-centric data elements
5.0 Draft Permit		
5.1 Will the agency draft a permit?		

5.2 Agency drafts permit	***Interactive Form G: Permit Builder*** Uses flowcharting of state/federal rules (similar to 4.3) to determine both general and special terms and conditions to be contained within the permit OR ***Report J: Permit*** Uses query language and/or reports builder to read and extract data from the permit within the database -Initiates a macro on the extracted information in order to place the data in the correct permit format. -Includes an audit function that logs each change to data as the change is made -Audit function notes the user initiating the change, the date the change was made, the data that was entered, and the project in which the change was initiated	All facility-centric data elements
5.3 Agency sends preliminary copy of permit to facility	***Report K: Permit Cover Letter*** Letter Builder uses query language and/or a reports builder to read and extract data for incorporation into cover letter for permit	
5.4 Agency issues notice of intent to deny permit	***Report L: Notice of Intent to Deny Permit*** Letter Builder uses query language and/or a reports builder to read and extract data for incorporation into letter stating intent to deny permit and reasons therefore	

6.0 Public Participation		
6.1 Agency publishes public notice (Including: 6.1.1. Application available for public review, 6.1.2. Preliminary copy of permit available for public review 6.1.3 Notice of intent to deny permit available for public review)	***Report C: Mailing List*** Lists names, addresses, and e-mail addresses of public entities to be notified of permit application ***Report M: Public Notice of Intent to Apply for Permit*** Letter Builder uses query language and/or a reports builder to read and extract data for incorporation into letter stating facility's intent to apply for permit ***Alert E: Public Notice of Intent to Apply for Permit*** Letter Builder generates an Email notice to e-mail addresses on mailing list and attaches or incorporates Report M ***Web Site Page D: Notice of Intent to Apply for Permit*** Covers a set time period. Summary list: Places facility name, date of intent to apply, and type of permit in a list of all facilities with **applications pending** and uploads the list to the agency web site. ***Web Site Page E: Application Notices*** Covers a set time period. Summary list: Places facility name, date of application submission, and type of permit in a list of all facilities with **applications submitted** and uploads the list to the agency web site. ***Web Site Page(s) F: Facility Detail*** For each facility, provides descriptive information of the location and the hazardous wastes addressed. Provides the possibility of drilling down to access specific information on facility's history, critical location factors, and waste management. ***Web Site Page G: Status of Preliminary and Final Permits*** Covers a set time period. Summary list: Places facility name, date of permit, type of permit, and agency intent to approve or deny it, or issuance date, in a list of all facilities with **Permits** and uploads the list to the agency web site. Drill down from this page to Website Page F: Facility Detail and Website Page H: Permit Detail. ***Web Site Page(s) H: Permit Detail*** For each permit, provides descriptive information of permit status. Provides the possibility of drilling down to the facility and thence to access specific information on facility's history, critical location factors, and waste management.	Mailing list Type of Permit All facility-centric data elements
6.2 Public submits comments	***Interactive Form H: Public Comments*** Allows the public the ability to submit comments online or with a downloaded form. Includes on-line confirmation of receipt.	Facility Identifiers (ID, Name, Address, Location, Contact) Comments

6.3 Agency receives public comments	***Data Upload D: Pre-Application Public Comments - Electronic*** Uploads comments from the internet or from CD or email ***Data Upload E: Pre-Application Public Comments - Paper*** Uploads scanned comments	Facility Identifiers (ID, Name, Address, Location, Contact) Comments(Facility ID, Author, Organization, Comment Type, Comment)
6.4 Agency reviews public comments	***Report N: Public Pre-Application Comments*** Summarizes information from the Notice of Intent to Apply for Permit and appends a list of all pertinent public comments	Mailing list Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Comments
6.5 Agency determines whether to hold a public hearing 6.5.1 Agency notifies public of hearing		
6.6 Agency holds public hearing	***Workflow Calendar A: Permit Tracking Calendar*** Agency updates calendar to include date and time of public hearing ***Alert E: Public Notice of Intent to Apply for Permit*** Letter Builder generates an Email notice to e-mail addresses on mailing list and attaches or incorporates Report M ***Interactive Form I: Hearing Comments*** Allows the Agency to input comments from the hearing ***Data Upload F: Hearing Comments*** Uploads comments ***Web Site Page I: Comments Posting*** Summary or compendium of public comments. Included date, place, source and substance of comments.	Mailing list Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Permit Tracking Calendar Entries (Function, Meeting Type, Meeting Time, Meeting Date, Meeting Duration, Task/Milestone Begin, Task/Milestone End, Task/Milestone Owner, Meeting Notes)
6.7 Agency reviews comments from hearing	***Report P: Public Post-Hearing Comments*** Summarizes information from the Notice of Intent to Apply for Permit and appends a list of public comments made at the hearing ***Interactive Form I: Hearing Comments*** Allows the Agency to input comments from the hearing ***Data Upload G: Agency Response to Hearing*** Uploads agency response	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Comments

6.8 Agency responds to public comments (includes 6.8.1 Agency posts public comments and responses)	***Report Q: Agency Response to Public*** Summarizes information from the Notice of Intent, includes boilerplate, and agency response. ***Alert F: Agency Response to Hearing*** Letter Builder generates an Email notice to e-mail addresses on mailing list and attaches or incorporates Report M ***Web Site Page J: Agency Response to Public Comment*** Summarizes agency response to public comment about the facility in question	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Comments
7.0 Permit Decision		
7.1 Will the agency issue a final permit?		
7.2 Agency prepares final permit (agency finalizes permit by incorporating information from public comments, as appropriate)	***Report R: Permit*** Permit boilerplate is populated with all pertinent information from application and agency response to public comments	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Applicable Law Waste Management Unit Checklist (Unit, Unit #, Status, Design Capacity, Years Used, Date in Service) Registration tie-in Attachments (Attachment Type, Attachment blob, Electronic Signature) Facility Description (type of hazardous waste management, critical location factors, wastewater disposition, adjacent landowners, siting criteria, additional requirements, emergency data, etc.) Inspection Schedule Arrangements with Local Authorities Waste (type, source, volume, code, sampling) Storage(types. Areas. Capacity, hazard type, operating conditions, etc.) Geology and Topography Closure Plans Finances Licensing Fees Comments

7.3 Agency issues final permit	***Alert G: Permit Issuance*** Agency emails facility and attaches Permit (Report R) ***Web Site Page G: Status of Preliminary and Final Permits*** Covers a set time period. Summary list: Places facility name, date of permit, type of permit, and agency intent to approve or deny it, or issuance date, in a list of all facilities with **Permits** and uploads the list to the agency web site. Drill down from this page to Website Page F: Facility Detail and Website Page H: Permit Detail.	Facility Identifiers (ID, Name, Address, Location, Contact)
7.4 Agency denies permit (includes 7.4.1 Agency issues denial letter)	***Report S: Permit Denial*** Agency emails facility with boilerplate denial of permit ***Alert H: Permit Denial*** Agency emails facility and attaches denial	Facility Identifiers (ID, Name, Address, Location, Contact) Rejection (Facility ID, Basis for Rejection, Date of Rejection, Rejection Iteration)
7.5 Does the public or facility file a permit?		
7.6 Agency processes permit appeal	***Interactive Form J: Appeal*** Allows the Facility to submit reasons for appeal	Facility Identifiers (ID, Name, Address, Location, Contact) Type of Permit Appeal (Facility ID, Basis for Appeal, Date of Appeal, Appeal Iteration)
7.7 Agency issues final permit after permit appeal	***Report R: Permit*** ***Alert G: Permit Issuance*** Agency emails facility and attaches Permit (Report R)	Facility Identifiers (ID, Name, Address, Location, Contact)
7.8 Final permit remains after permit appeal		

Appendix C summarizes the types of requirements and sorts them by type.

3.3 Defining RCRA E-Permitting Data

In considering actual data elements, requirements should take advantage of standards established by EPA in its Environmental Data Registry. Data standards are of the utmost importance when migrating or integrating data from legacy systems, so it is especially desirable to write requirements that take the work already accomplished in this area into consideration. For example, a list of relevant data standards includes the following:

- On data supporting RCRA
  http://www.epa.gov/epaoswer/hazwaste/data/index.htm#rcra-info

- On Data Standards
  http://oaspub.epa.gov/edr/epastd$.startup#1

- On Data Standards for Permitting
  http://oaspub.epa.gov/edr/edr_proc_qry.navigate?P_LIST_OPTION_CD=CSDIS&P_REG_AUTH_IDENTIFIER=1&P_DATA_IDENTIFIER=19942&P_VERSION=1

- On E-permitting Business Rules
  http://www.epa.gov/edr/fpermittingbr.pdf

- On E-permitting in general
  http://www.epa.gov/edr/permittingfs.pdf

- On Standard Data Elements
  http://www.epa.gov/edr/fpermitting.pdf

- Frequently Asked Questions about Permitting Standards
  http://www.epa.gov/edr/fpermitting_faq.pdf

- On the Data standard Process
  http://oaspub.epa.gov/edr/BUS_RULE$.STARTUP

4.0 Entity Relationship Diagram (ERD)

The ERD (Appendix D) provides an overview of data elements, organized by grouping data that serves to describe each aspect of a RCRA E-Permitting system. The purpose of this chart is to provide a holistic view of the data requirements. All major areas are represented, but the detail is kept to the highest possible level consistent with clarity. Thus, each box contains enough data elements to show what kind of information needs to be stored and accessed, and is not intended to represent a complete list. Additionally, many of the elements concentrated in one box could be split into sub-groups, but the number of such sub-groups was kept to a minimum for the sake of limiting the table's complexity.

The following chart summarizes data groups and data elements presented in the ERD:

Data Group	*Data Elements*
APPEAL	**Appeal ID**
APPEAL	Appeal Iteration
APPEAL	Basis for Appeal
APPEAL	Date of Appeal
APPEAL	**Permit ID**
APPLICABLE LAW	**Applicable Law ID**
APPLICABLE LAW	Content
APPLICABLE LAW	State/Federal
APPLICABLE LAW	Statute
APPLICABLE LAW	Summary
APPLICATION COPY OF RECORD (COR)	COR Date
APPLICATION COPY OF RECORD (COR)	Electronic Signature
APPLICATION COPY OF RECORD (COR)	**Facility ID**
APPLICATION COPY OF RECORD (COR)	**Past Permit ID**
APPLICATION COPY OF RECORD (COR)	Permit Application Date
APPLICATION COPY OF RECORD (COR)	Permit Expiration Date
APPLICATION COPY OF RECORD (COR)	**Permit ID**
APPLICATION COPY OF RECORD (COR)	Permit Issuance/Renewal Date
APPLICATION COPY OF RECORD (COR)	Permit Iteration
APPLICATION COPY OF RECORD (COR)	Signed by
ATTACHMENT	Attachment blob
ATTACHMENT	Attachment Date
ATTACHMENT	**Attachment ID**
ATTACHMENT	Attachment Source
ATTACHMENT	Attachment Type
ATTACHMENT	Electronic Signature
ATTACHMENT	**Facility ID**
ATTACHMENT	Other identification
ATTACHMENT	**Permit ID**
ATTACHMENT	**Waste ID**
ATTACHMENT	**Waste Unit ID**
AUDIT*	Area
AUDIT*	Audit ID
AUDIT*	City
AUDIT*	E-mail
AUDIT*	First Name
AUDIT*	Honorific
AUDIT*	Last Name
AUDIT*	Log
AUDIT*	Organization
AUDIT*	State
AUDIT*	Street Address
AUDIT*	Suffix
AUDIT*	Zip
BP FUNCTIONS*	Function Description
BP FUNCTIONS*	**Function ID**
CONTINGENCY PLAN	Arrangement w/ Local Authority
CONTINGENCY PLAN	Contingency Plan ID
CONTINGENCY PLAN	Emergency Coordinator

Data Group	*Data Elements*
CONTINGENCY PLAN	Emergency Response Process
CONTINGENCY PLAN	**Facility ID**
CONTINGENCY PLAN	Implementation
CONTINGENCY PLAN	Site Plan
CRITICAL LOCATION FACTOR*	Critical Factor Attribute ID
CRITICAL LOCATION FACTOR*	Critical Factor Description
CRITICAL LOCATION FACTOR*	Critical Factor ID
CRITICAL LOCATION FACTOR*	Critical Factor Type
CRITICAL LOCATION FACTOR*	**Facility ID**
CRITICAL LOCATION FACTOR*	Geology/Topography ID
CRITICAL LOCATION FACTOR*	**Waste ID**
FACILITY	Additional requirements
FACILITY	Adjacent landowners
FACILITY	Agency Comments
FACILITY	Alias
FACILITY	Contact
FACILITY	Emergency data
FACILITY	EPA ID
FACILITY	Facility Address
FACILITY	Facility Comments
FACILITY	Facility Description
FACILITY	**Facility ID**
FACILITY	Facility Location
FACILITY	Facility Name
FACILITY	Facility Parent
FACILITY	Legal Boundaries
FACILITY	Location (Lat/Long)
FACILITY	Other…
FACILITY	State ID
GEOLOGY/TOPOGRAPHY	Critical Location Factor ID
GEOLOGY/TOPOGRAPHY	**Facility ID**
GEOLOGY/TOPOGRAPHY	Geology Notes
GEOLOGY/TOPOGRAPHY	Topography Notes
GEOLOGY/TOPOGRAPHY	**Waste ID**
HAZARD	Capacity
HAZARD	Characteristic Waste Type
HAZARD	**Facility ID**
HAZARD	Hazard Type Description
HAZARD	**Hazard Type ID**
HAZARD	Operating Conditions
HAZARD	**Waste ID**
INSPECTION SCHEDULE	**Facility ID**
INSPECTION SCHEDULE	**Inspection Schedule ID**
INSPECTION SCHEDULE	Schedule Duration
INSPECTION SCHEDULE	Schedule End
INSPECTION SCHEDULE	Schedule Frequency
INSPECTION SCHEDULE	Schedule Start
LICENSING FEES	Date Due
LICENSING FEES	Date Paid
LICENSING FEES	**Facility ID**
LICENSING FEES	Fee Amount

Data Group	*Data Elements*
LICENSING FEES	License Type
LICENSING FEES	**Permit ID**
MILESTONE TYPE	Milestone Description
MILESTONE TYPE	**Milestone Type ID**
MILESTONE TYPE	Task Code
PERMIT CALENDAR	**Function ID**
PERMIT CALENDAR	Meeting Date
PERMIT CALENDAR	Meeting Duration
PERMIT CALENDAR	Meeting Notes
PERMIT CALENDAR	Meeting Time
PERMIT CALENDAR	Meeting Type
PERMIT CALENDAR	Milestone Begin
PERMIT CALENDAR	Milestone End
PERMIT CALENDAR	**Milestone Type ID**
PERMIT CALENDAR	**Permit Calendar ID**
PERMIT CALENDAR	**Permit ID**
PERMIT CALENDAR	Task Begin
PERMIT CALENDAR	Task End
PERMIT CALENDAR	**Task Type ID**
PERMIT CALENDAR	Task/Milestone Owner
PERMIT STATUS	**Applicable Law ID**
PERMIT STATUS	**Applicable Law ID**
PERMIT STATUS	Application Date
PERMIT STATUS	Application Date
PERMIT STATUS	Application Review Actual Start
PERMIT STATUS	Application Review Actual Start
PERMIT STATUS	Application Review Scheduled Finish
PERMIT STATUS	Application Review Scheduled Finish
PERMIT STATUS	Application Review Scheduled Start
PERMIT STATUS	Application Review Scheduled Start
PERMIT STATUS	Date of Intent to Apply
PERMIT STATUS	Date of Intent to Apply
PERMIT STATUS	**Facility ID**
PERMIT STATUS	**Facility ID**
PERMIT STATUS	Hearing Date
PERMIT STATUS	Hearing Date
PERMIT STATUS	Permit End Date
PERMIT STATUS	Permit End Date
PERMIT STATUS	**Permit ID**
PERMIT STATUS	**Permit ID**
PERMIT STATUS	Permit Issuance or Denial Date
PERMIT STATUS	Permit Issuance or Denial Date
PERMIT STATUS	Permit Iteration
PERMIT STATUS	Permit Iteration
PERMIT STATUS	Permit Start Date
PERMIT STATUS	Permit Start Date
PERMIT STATUS	**Permit Status ID**
PERMIT STATUS	**Permit Status ID**
PERMIT STATUS	**Permit Type ID**
PERMIT STATUS	**Permit Type ID**
PERMIT STATUS	Public Comments Due Date

Data Group	*Data Elements*
PERMIT STATUS	Public Comments Due Date
PERMIT STATUS	Public Notification Date
PERMIT STATUS	Public Notification Date
PERMIT TYPE*	Permit Type Description
PERMIT TYPE*	**Permit Type ID**
PUBLIC COMMENTS	Author
PUBLIC COMMENTS	Comment
PUBLIC COMMENTS	Confirmation Code
PUBLIC COMMENTS	**Facility ID**
PUBLIC COMMENTS	Organization
PUBLIC COMMENTS	**Permit ID**
PUBLIC COMMENTS	Public Comment Type
PUBLIC COMMENTS	**USER**
PUBLIC COMMENTS	User Affiliation
PUBLIC COMMENTS	User IP Address
PUBLIC COMMENTS	User Logon Trace
PUBLIC COMMENTS	User Name
PUBLIC COMMENTS	User Password
PUBLIC COMMENTS	User ID
REGISTER	**Register ID**
REGISTER	State/Federal
REGISTER* TIE-IN	**Facility ID**
REGISTER* TIE-IN	**Register ID**
REGISTER* TIE-IN	**Register Tie-In ID**
REGISTER* TIE-IN	Register's Facility Code
REGISTER* TIE-IN	Register's Facility Name
REJECTION	Basis for Rejection
REJECTION	Date of Rejection
REJECTION	**Permit ID**
REJECTION	**Rejection ID**
REJECTION	Rejection Iteration
STORAGE AREA	**Storage Area ID**
STORAGE AREA	Storage Area Name
STORAGE AREA	**Waste ID**
STORAGE/TREATMENT TYPE	Capacity
STORAGE/TREATMENT TYPE	Hazard Type ID
STORAGE/TREATMENT TYPE	Operating Conditions
STORAGE/TREATMENT TYPE	Storage Type Description
STORAGE/TREATMENT TYPE	**Storage Type ID**
SWMU*	Description
SWMU*	Location
SWMU*	Release
SWMU*	**SWMU ID Facility ID**
SWMU*	**Waste ID**
TASK TYPE	Task Description
TASK TYPE	**Task Type ID**
WASTE	**Facility ID**
WASTE	**StorageType ID**
WASTE	**Waste ID**
WASTE	**Waste Sampling ID**
WASTE	Waste Source

Data Group	*Data Elements*
WASTE	**Waste Type ID**
WASTE	Waste Volume
WASTE MANAGEMENT UNIT	Date in Service
WASTE MANAGEMENT UNIT	Design Capacity
WASTE MANAGEMENT UNIT	Status
WASTE MANAGEMENT UNIT	Unit #
WASTE MANAGEMENT UNIT	**Waste ID**
WASTE MANAGEMENT UNIT	Waste Unit Description
WASTE MANAGEMENT UNIT	**Waste Unit ID**
WASTE MANAGEMENT UNIT	Waste Unit Type
WASTE MANAGEMENT UNIT	Years Used
WASTE SAMPLING	Sample Attribute
WASTE SAMPLING	Sample Frequency
WASTE SAMPLING	Sample Type
WASTE SAMPLING	**Waste Sampling ID**
WASTE TYPE	Waste Type Attribute
WASTE TYPE	Waste Type Description
WASTE TYPE	**Waste Type ID**
WASTE UNIT TYPE	Waste Unit Type Description
WASTE UNIT TYPE	**Waste Unit Type ID**

Appendix A

Business Process for RCRA E-Permitting
(see attached)

Appendix B

Functions, Sub-Functions, and Best Practices
(see attached)

Appendix C

Summary of Requirement Types

Access A: Facility Search Screen
Access B: Permit Search Screen
Access C: Case Assignment Screen

Alert A: New Request Notice
Alert B: First Receipt
Alert C: Case Assignment Notice
Alert D: Application Receipt Notice
Alert E: Public Notice of Intent to Apply for Permit
Alert F: Agency Response to Hearing
Alert G: Permit Issuance
Alert H: Permit Denial

Data Upload A: Upload Application
Data Upload B: Correct Application
Data Upload C: Supplemental Information for Application
Data Upload D: Pre-Application Public Comments - Electronic
Data Upload E: Pre-Application Public Comments - Paper
Data Upload F: Hearing Comments
Data Upload G: Agency Response to Hearing

Interactive Form A: Permit Modification Request Form
Interactive Form B: Permit Renewal Request Form
Interactive Form C: New Permit Notification Form
Interactive Form D: Application Part A
Interactive Form E: Application Part B
Interactive Form F: Submission
Interactive Form G: Permit Builder
Interactive Form H: Public Comments
Interactive Form I: Hearing Comments
Interactive Form J: Appeal

Reference Table A: Permit Type
Reference Tables: (Many)

Report A: Facility History
Report B: Facility Status
Report C: Mailing List
Report D: Public Participation Schedule
Report E: Confirmation of Application Receipt
Report F: Request for Additional Information
Report G: Application Discrepancies
Report H: Notice of Completeness
Report I: Request for Additional Information
Report J: Permit
Report K: Permit Cover Letter
Report L: Notice of Intent to Deny Permit
Report M: Public Notice of Intent to Apply for Permit
Report N: Public Pre-Application Comments
Report O: Announcement of Public Hearing

Report P: Public Post-Hearing Comments
Report Q: Agency Response to Public
Report R: Permit
Report S: Permit Denial

Security Procedure A: Setup User Login
Security Procedure B: Check on logon activity

Web Site Page A: How to Apply for a Permit
Web Site Page B: Pre-Application Meeting
Web Site Page C: Application Instructions
Web Site Page D: Notice of Intent to Apply for Permit
Web Site Page E: Application Notices
Web Site Page(s) F: Facility Detail
Web Site Page G: Status of Preliminary and Final Permits
Web Site Page(s) H: Permit Detail
Web Site Page I: Comments Posting
Web Site Page J: Agency Response to Public Comment

Workflow Calendar A: Permit Tracking Calendar

Appendix D

RCRA E-Permitting Entity Relationship Diagram (ERD)

The ERD uses several visual aids; a summary of the visual aids follows:

First, table borders are differentiated:

A solid box border is used for **dynamic** data tables. Dynamic tables, such as Permit Status, Waste Management Unit, and Public Comments, contain data specific to a particular facility or permit. They are constantly updated by the facility managers or by state agency staff.

- A label-style box border (three concentric lines) is used for **static** data tables. These are typically look-up tables that contain data that changes very seldom, such as Applicable Laws or Waste Types. These tables drive the menus that appear on the interactive forms. They are updated by system administrators at rare intervals.

Second, color is used to show related tables:

- Central or main tables are shown with a color fill.
  - Green for Facility related data
  - Yellow, for Facility and Waste related data
  - Brown, for Facility, Waste, and Waste Management Unit related data
  - Purple for Permit Status related data
  - Blue of Permit Status and Permit Calendar related data

- Related tables are shown with a color border. Borders of subordinate tables match the colors of the main tables to which they relate.

- Unrelated tables are shown with a black border. These tables, which include User, mailing List, and Audit, are independent of Facility or Permit Status but will be needed to generate reports. Although they are dynamic in nature, they are typically updated by system administrators or their designees.

Third, relationships are shown using one-to-many conventional icons and keys:

- A line indicates a relation

- A small circle-and-bar across the line indicates that the box near the bar may have zero or one entries

- A fan of three lines at the line end indicates that the box near the fan may have many related entries

- Keys are data elements that are used to uniquely identify each row of data in a data table. As such, when used in two or more different tables they tie the data in those tables to each other: the primary key is used in the table of origin; the secondary key ties data in a related table to the first.
  - Primary Keys for each table are shown in bold black
  - Secondary Keys are shown in the appropriate color

(See attached Entity Relationship Diagram)