

**General Description of Illinois EPA's
RCRA Corrective Action Program
March 2003**

1.0 INTRODUCTION

Section 3004 of RCRA and 35 Ill. Adm. Code 724.201 requires owners/operators of hazardous waste management facilities receiving final RCRA permits to institute corrective action as necessary to protect human health and the environment from all releases of hazardous wastes and hazardous constituents from any Solid Waste Management Unit (SWMU) at the facility. To comply with this requirement, the facility must carry out a Corrective Action Program in accordance with the terms and conditions set forth in the final RCRA permit issued to the facility. The Illinois EPA has been authorized to implement these requirements since April 1990; USEPA is implementing corrective action at facilities with RCRA permits issued prior to April 1990. The purpose of this document is to describe the general procedures associated with meeting corrective action requirements at facilities in Illinois which received a RCRA permit after April 1990.

2.0 DEFINITION OF A SWMU

Before discussing the details of a Corrective Action Program, it is first necessary to define the phrase "solid waste management unit" or "SWMU." Typically, a SWMU is any discernible waste management unit at a RCRA facility from which hazardous constituents might migrate, regardless of whether the unit was intended for the management of solid and/or hazardous waste. This typically includes, but is not limited to, the following waste management units: landfills; waste piles; surface impoundments; land treatment areas; underground or above ground waste storage tanks; drum storage areas; wastewater treatment facilities; laboratories (if the waste is stored in the lab); boilers or incinerators using waste as a fuel; spills from waste storage areas; spills that occur repeatedly in the same area from waste or product storage areas; tank trucks if used to store wastes for a period of time; sewer systems; satellite accumulation areas for wastes; processes that use a waste (including all tanks, sumps and piping in that system; regulated units covered in a permit or application; tank car or truck unloading areas; sumps that collect waste; scrubbers; baghouses; Safety-Kleen units or other types of washing/degreasing units; and drum washing areas.

In addition to the specific units mentioned above, there may be areas of concern (AOC) at a facility that need to be addressed. This subset of SWMUs are areas where releases have occurred or are suspected to have occurred which have or may have adversely impacted the environment.

3.0 GENERAL DESCRIPTION OF A CORRECTIVE ACTION PROGRAM

A Corrective Action Program is a comprehensive environmental investigation program and, as necessary, a remediation program which addresses releases of hazardous wastes or hazardous constituents to the environment from the SWMUs/AOCs at a facility. This program typically includes:

- (1) An Illinois EPA review of historic waste management practices for the site and identification of the SWMUs/AOCs at the site, including a site inspection to further evaluate the SWMUs/AOCs at the facility. The results of these efforts are documented in a RCRA Facility Assessment report (RFA).
- (2) Imposition of a corrective action program for a facility through the issuance of a RCRA permit. The permit will: (a) identify those SWMUs/AOCs of concern at the facility; and (b) describe the procedures which should be carried out to investigate and remediate, as necessary, any releases at these SWMUs/AOCs. The RFA described in Item 1 above forms the basis for establishing these requirements.
- (3) Development and implementation of interim measures by the facility to address any immediate threats from a given release before that release can be thoroughly evaluated.
- (4) An investigation by the facility (referred to as a RCRA Facility Investigation) to determine if the SWMUs/AOCs of concern as identified in the permit have had a release to the environment and the extent of any such releases; and
- (5) Development and implementation of corrective measures by the facility to remediate any identified releases which pose a threat to human health and the environment.

A more detailed description of the various components of a standard corrective action program, as described above, is provided in Sections 4.0 through 8.0 which follow. An updated version of the standard corrective action process is provided as Attachment A of this document. Section 4 of Attachment A provides a description of the information which should be submitted to Illinois EPA if a facility desires to implement a corrective action program different from that described in this document or Attachment A.

4.0 RCRA FACILITY ASSESSMENT

The RCRA Facility Assessment (RFA) is the first step of the RCRA corrective action program. The RFA is conducted by Illinois EPA to identify, characterize and locate SWMUs/AOCs at a facility. It also provides a preliminary determination of which SWMUs/AOCs pose a potential threat to human health and the environment through

past/current/future releases of hazardous wastes/hazardous constituents to surrounding environmental media. Based upon the results of the RFA, Illinois EPA should have sufficient information to determine whether the next phase of corrective action (i.e., the RCRA Facility Investigation) is necessary and what the focus of this investigation should be. In addition, the need for possible interim measures should also be determined upon completion of the RFA.

As part of the RFA, Illinois EPA conducts a complete review of its files and other information sources to determine the existence and location of SWMUs/AOC (past and present) at the subject facility. SWMUs/AOCs associated with prior operators and the property are also SWMUs/AOCs of concern. Once the file review has been completed, Illinois EPA conducts a Visual Site Inspection (VSI) to observe the SWMUs/AOC and preliminarily determine which SWMUs/AOCs potentially could have released hazardous waste and/or hazardous constituents to underlying or surrounding environmental media based on: (1) the characteristics of the wastes managed; (2) the construction of the SWMU/AOC; (3) operations of the SWMU/AOC and (4) condition of the SWMU/AOC. Based upon all information compiled from the file review and VSI, Illinois EPA identifies which SWMUs/AOC at the facility require investigations to determine if they have released hazardous waste/hazardous constituents to underlying or surrounding environmental media (soil, air, surface water, groundwater).

The results of the activities described above are documented in the form of a report, generally referred to as the "RFA." Once completed, the RFA is used to develop the corrective action of the final RCRA permit being issued to a facility, including any portions of the permit regarding the imposition of interim measures. Specifically, the RFA is used to identify: (1) what SWMUs/AOCs must be investigated during the RFI; (2) what environmental media must be investigated during the RFI and (3) what if any interim measures must be implemented to address any known releases of immediate concern.

5.0 IMPOSITION OF CORRECTIVE ACTION REQUIREMENTS

The RCRA permit issued to a given facility will contain a section which sets forth the procedures for implementing a corrective action program to ensure the requirements of 35 Ill. Adm. Code 724.201 are met. Specifically, the corrective action section of the permit will:

1. Identify the SWMUs/AOCs of concern which must be investigated for possible releases during the RCRA Facility Investigation. The environmental media (soil, groundwater, air, surface water/sediments) which must be evaluated for these possible releases will also be identified. The RFA will form the foundation for this portion of the permit.

2. Describe the procedures to be followed in carrying out the RCRA Facility Investigation and the Corrective Measures Program.
3. Identify any necessary interim measures which need to be taken in response to known releases from SWMUs/AOCs at the facility, until such time as the release can be fully evaluated in accordance with the procedure set forth in Item 2 above. The RFA will again form the foundation for this portion of the permit. It must be noted that requirements for interim measures are not always necessary when a permit is issued.
4. Describe the procedures to be followed if a facility finds: (1) a new release from an existing SWMU; or (2) a new SWMU. These procedures are similar to the investigation and corrective measures procedures identified in Item 2 above.
5. Require that the facility maintain financial assurance for corrective action in accordance with 35 Ill. Adm. Code 724.201.

6.0 INTERIM MEASURES

Interim measures are not a required phase of the corrective action program at a facility. Interim measures are corrective measures which are imposed by Illinois EPA prior to the completion of the formal corrective action program when it is determined that releases of hazardous waste/hazardous constituents pose such a threat to human health and the environment that a fast-track measure must be taken to address the problem. These measures are typically carried out until such time that they can be incorporated into the final corrective measures selected for the entire site. Imposition of interim measures is typically written into the Corrective Action Portion of the final RCRA permit; however, based upon other issues, interim measures may be imposed at other times during the term of the permit.

It is not necessary for every facility to conduct interim measures; interim measures should only be required when it is known that a facility is having a detrimental impact on human health of the environment. Interim measures typically include environmental media monitoring, installation of remediation systems, and installation/imposition of institutional controls (e.g., construction of a gate surrounding the area of concern, capping an area of concern, etc.) at the site.

7.0 FACILITY RCRA INVESTIGATION

The RCRA Facility Investigation (RFI) is conducted to determine if the SWMUs/AOC of concern identified during the RFA have released contaminants to surrounding environmental media, and if so, the extent and character of the release. The procedures for conducting the

RFI and the SWMUs/AOCs to be evaluated during the RFI are identified in the facility's RCRA permit. Typically, the RFI is conducted in three phases in order to facilitate investigation and review of the investigation data. One thing that is very important to keep in mind while conducting a RFI is: *What Are The Goals Of The Investigation*. The investigative efforts necessary to achieve one goal are not the same as those necessary to achieve a different goal. It is also important to review available records and determine what may be found when investigating a given SWMU; this information could have grave impacts on the goals and expectations of an investigation.

The first phase of the RFI typically consists of an initial evaluation to determine if a release of hazardous waste/hazardous constituents have occurred from the unit, focusing mainly on soil. Phase I investigations may also need to evaluate releases to the (1) air, (2) surface water, and (3) groundwater (if there are SWMUs/AOC of concern at a facility which are land disposal units).

The results of the Phase I generally determine whether or not there has been a release from a given SWMU/AOC. If it appears as though there has been a release or if additional information is necessary to demonstrate there has been no release, then the RFI should move into a second phase. The goal of the second phase of an RFI is to determine the extent of the contamination detected during the first phase of the RFI.

The results of the Phase II investigation may indicate that contamination is limited to a specific environmental media of concern. In such cases, Illinois EPA and the owner/operator will make a determination of whether corrective measures are necessary based upon the potential threat to human health and the environment. However, if it is determined through the RFI that additional environmental media have been impacted (e.g., contaminants leached from the soils to the underlying groundwater), additional environmental investigations will be required.

The third phase of the RFI generally specifically addresses contaminant detection and extent determinations for groundwater. This phase typically is only necessary when it has been determined that groundwater may have been or has been impacted by SWMU/AOC operations. If the results of the groundwater monitoring program detects contamination above the applicable groundwater standard a determination of the horizontal and vertical extent and rate of migration of the contaminant plume must be conducted. Based upon the results of this third phase of the RFI the owner/operator and the Illinois EPA will determine the necessity to institute corrective measures at the site. Many times, this Phase III investigation can be conducted as part of the Phase II effort.

At the end of the RFI, the results must be compared to remediation objectives developed in accordance with 35 Ill. Adm. Code 742. This effort will identify those SWMUs/AOCs which require some type of corrective measure to address the detected contamination (this

includes the establishment of any engineered barriers or institutional controls necessary to support the remediation objectives). In some cases (such as landfills), it may not be appropriate to establish remediation objectives, but rather it would be appropriate to establish some type of final cover system over the SWMU/AOC and provide “post-closure care” (including groundwater monitoring and, as necessary, remediation) for the unit.

8.0 CORRECTIVE MEASURES PROGRAM

The last phase of a corrective action program is the Corrective Measures Program (CMP). The goal of the CMP is to address the contamination identified during the RFI. A CMP should be broken down into five phases which build on each other:

1. The first phase of the CMP consists of development and submission of a conceptual design(s) of any necessary corrective measure chosen for each SWMU/AOC.
2. The second phase consists of submission of the final design plan for the corrective measure, including operation/maintenance plans, and plans for the actual installation of the desired corrective action.
3. The third phase of the CMP is the actual construction/installation of the selected corrective measure.
4. The fourth phase consists of operation, maintenance and monitoring of the selected corrective measure to ensure it is properly protecting human health and the environment.
5. The fifth phase consists of compiling information to demonstrate that the selected corrective measure has adequately addressed the contamination initially of concern.

Workplans, reports, etc. must be developed to document how the Permittee will carry out the required corrective measure at each SWMU of concern. All such documents must be reviewed and approved by Illinois EPA.

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Attachment A: Updated Process for Implementing a RCRA Permitted Facility in Illinois

Attachment A
Alternative Processes for Implementing a
Corrective Action Program at a RCRA Permitted Facility in Illinois
March 2003

1.0 Introduction/Purpose

Illinois EPA has been authorized to implement the corrective action program at RCRA permitted facilities since April 1990. In addition, Illinois EPA has been authorized to review interim status RCRA closure plans since 1982 and closure plans at RCRA permitted facilities since 1986. As such, Illinois EPA has a substantial amount of experience in overseeing RCRA remediation projects and would like to use this experience to establish an efficient RCRA corrective action process which will lead to timely and effective remedial efforts at RCRA permitted facilities.

The typical corrective action program includes development of a series of workplans and reports associated with investigation and remediation efforts. This document has been prepared to set forth an alternative process which facilities may desire to follow in carrying out a corrective action program being implemented at a facility with a RCRA permit from Illinois EPA. While this alternative process looks very similar to the standard process, the standard process has been streamlined somewhat. Illinois EPA understands that facilities may desire to use other procedures to carry out a corrective action program and is open to reviewing proposals for such alternatives; this topic is also discussed at the end of this document.

2.0 Overview of Alternative Process

Illinois EPA is only authorized to implement RCRA corrective action programs at facilities with RCRA permits; USEPA, Region 5 is the only governmental entity which can require corrective action at RCRA interim status under Section 3008(h) of RCRA. Thus, the procedures for carrying out a RCRA corrective action program being overseen by Illinois EPA is set forth in a facility's RCRA permit.

Illinois EPA believes the best way to implement a successful RCRA corrective action program at a facility is to require development a series of succinct plans and reports which are subject to review and approval. For this type of process to be successful, Illinois EPA understands that it must provide timely reviews (60-90 days) of these submittals. In addition, good communication (written, oral, informal and formal) and trust are also required for this process to be successful.

Illinois EPA understands that this is a little different approach to the results oriented process being used by USEPA, Region 5. However, if Illinois EPA and a facility work together closely in the development and timely approval of these documents, the corrective action program implemented at a facility should be successful and completed in a very timely and efficient manner.

Written plans, reports, and approval letters regarding the various aspects of a corrective action program allows everyone to clearly understand where the program is going, what its goals are, and how the program will achieve the goal. It also allows for documentation of agreements and decisions made during the program so that: (1) issues do not get re-visited time and time again; (2) the scope of the remaining activities necessary to complete the program are narrowed through each step of the program; and (3) new people who begin work on the project in the future or become interested in the project in the future can easily understand all the history of the project and all the decisions made during the project.

Timely written approval of succinct workplans and reports associated with each step of the corrective action program will allow Illinois EPA and the facility to continue narrowing the issues being evaluated as the overall project progresses. Specifically, the activities conducted in a given step of a corrective action program is very much dependent on the results of the previous step. If there is not total agreement on the results of a given step, then the activities completed in the next step and their next steps may not be acceptable to the Illinois EPA.

The documents which Illinois EPA recommends be developed and approved include: (1) Current Conditions Report; (2) RCRA Facility Investigation Workplans; (3) Final Site Investigation Report/Remedial Objectives Report; (4) Corrective Measures Plan; (5) Corrective Measures Report; and (6) Corrective Measures Completion Report. Each of these documents are discussed in Section 3 below. More detail regarding the development, review, and implementation of these documents will be contained in the facility's RCRA permit. It must be noted that these documents are not that much different than the documents which must be developed in remediating a site in accordance with Illinois EPA's Site Remediation Program, as can be seen in the following table:

CA Document	Brief Description of Document	Similar SRP Document
Current Conditions Report	Compilation of existing Information about Facility	Phase I of Site Investigation Report
RFI Workplans	Proposed activities to conduct investigations	Workplan for Phase II of Site Investigation
Investigation Report/RO Report	Report investigation results and propose remediation objectives	Site Investigation Report—Remedial Objectives Report
Corrective Measures Plan	Detailed information regarding proposed corrective measure	Remedial Action Plan
Corrective Measures Report	Report documenting installation of corrective measures	Initial part of a Remedial Action Completion Report
Corrective Measures Completion Report	Report documenting completion of all required corrective measures	Remedial Action Completion Report

3.0 Recommended Plans and Reports

As indicated above, Illinois EPA believe that proper implementation of the RCRA corrective action program at a RCRA permitted facility should include development, approval, and implementation of six plans/reports. A brief description of the contents and purpose of each of these plans/reports is as follows:

1. Current Conditions Report. This report should:
 - a. Compile all existing known information about the facility and the SWMU/AOCs to be addressed in the corrective action program, based on a review of all available information, including the facility's files, Illinois EPA files, and published documents.
 - b. Use the RCRA Facility Assessment (RFA) developed by Illinois EPA as a foundation. The RFA formed the basis for the corrective action requirements set forth in the facility's RCRA permit, but was only developed based upon information available to Illinois EPA. The Current Conditions Report should contain any additional information available to the facility which was not available to Illinois EPA regarding the SWMUs/AOC and any other areas to be addressed in the corrective action program.
 - c. Be developed in general accordance with a Phase I environmental site assessment (ASTM Method E-1527).
 - d. Form the basis for identifying what SWMUs/AOC and other areas of concern need to be further evaluated in subsequent corrective action efforts.
2. RCRA Facility Investigation Workplans
 - a. The Current Conditions Report should identify those areas being evaluated under the corrective action program where the extent of potential/actual contamination must be investigated, based on the fact that suspected or actual releases have occurred within the area.
 - b. The primary purpose of the RCRA Facility Investigation is to fully characterize the extent of contamination at each area requiring investigation as identified in the Current Conditions Report. A second purpose of the RFI is to characterize, as necessary, the physical aspects of the aspects of the facility, such as the geology/hydrogeology of the site and man-made contaminant migration pathways.

- c. As the primary purpose of an RFI is characterizing contamination, the two most important aspects of an RFI are: (1) collecting samples in the proper locations; and (2) analyzing samples for the proper contaminants. RFI workplans must contain detailed information regarding these issues, as well as a discussion of and justification for the proposed activities.
 - (1) One of the most important things which must be identified is the goal of the proposed sampling event, as the goal of the effort has a direct impact on the activities that are carried out to achieve the goal.
 - (2) If metals are contaminants of concern, then it will be necessary to determine the pH of the soil and/or analyze soil samples using the TCLP/SPLP procedure to be able to properly evaluate the migration to groundwater exposure route.
 - (3) If it is anticipated that ROs will be eventually be developed using Tier 2 procedures, then it may be necessary to analyze soil samples for certain physical characteristics (e.g, organic carbon content and porosity);
 - (4) If it is anticipated that steps will be taken to eliminate certain exposure routes in the development of remediation objectives, then it will be necessary to analyze the soil samples for the constituent listed in 35 Ill. Adm. Code 742, Subpart C;
- d. The third important aspect of an RFI is the collection/analysis of the samples (this includes proper quality assurance/quality control procedures). Due to the fact that there are standard collection/analysis procedures which have been developed by USEPA and ASTM, RFI workplans do not need to contain developed information regarding these efforts. However, RFI workplans should identify what methods will be followed in carrying out these activities.
- e. RFI workplans should also contain brief introductory sections which contain: (1) background information about the overall project and the areas being investigated; and (2) the geology/hydrogeology of the facility, as that information is available. This information is necessary as it has a direct impact on the selection of proper sample locations.
- f. It is important that RFI workplans be developed for each sampling/analysis effort. Such plans are not only beneficial for review and approval by Illinois EPA, they are also necessary for the execution of the proposed sampling/analysis effort in the

field. It must be noted that several sampling/analysis efforts may need to be completed to properly characterize the contamination at a given unit.

3. Final Site Investigation Report/Remedial Objectives Report
 - a. This report should document the results of the RFI and contain an evaluation of these results by comparing them to proposed remediation objectives developed in accordance with 35 Ill. Adm. Code 742.
 - b. Illinois EPA has guidance regarding reporting of investigation reports and reporting proposed soil remediation objectives.
 - c. If waste is to remain in place at a given SWMU/AOC, then that unit should be closed as a landfill and then receive post-closure care (including groundwater monitoring, and as necessary, groundwater remediation).

4. Corrective Measures Plan
 - a. A Corrective Measures Plan should be developed to describe the activities which will be carried out to address any contamination present above the approved remediation objectives. In addition, this plan must contain the details which will be carried out to establish any engineered barriers or institutional controls, or other assumptions (such as land use control) used in the development of the approved remediation objectives. If waste is to be left in place at a SWMU/AOC, then the corrective measure plan must describe the procedures which will be used to establish a final cover over the unit and provide adequate post-closure care.
 - b. The level of detail and process which should be following in designing and implementing a corrective measure is dependent upon the actual corrective measure selected (for example, the level of detail/process for a corrective measure involving soil removal would be much different that the detail/process for a corrective measure involving some type of in-situ soil remediation technology). There is also a difference is the selected corrective measure does not actually remediate the contamination to approved remediation objectives, but rather addresses the unit in a manner to closing it as a landfill and providing post-closure care.
 - c. Illinois EPA does not require that a detailed feasibility study be conducted of the remedial options available to address the contamination of concern. Rather, the facility may propose a remedial action to Illinois EPA for review and approval, provided that the proposal also contain sufficient information demonstrating that

the remedial action will be: (1) able to achieve the approved remediation objectives; and/or (2) adequately protective of human health and the environment.

- d. The first step in implementing a corrective measures plan is development of a Conceptual Remedial Design Report. This report should describe the basic design components of the selected corrective measure and the steps which will be taken to complete the final design. In addition, this report should contain the information identified in Item 4.c above in support of the selected remedial action.
 - e. Once the Conceptual Design Report is approved, a Final Design Report should be developed. This report should contain: (1) plans and specifications for the construction/installation of the selected remedial action; (2) procedures (as necessary) for operating the selected remedial action, (3) calculations supporting the design of the remedial action; and (4) a sampling/analysis plan to be implemented at the end of the operation of the remedial action to verify that it achieved the approved remediation objectives. Such a report should be a natural component of the overall effort to construct and operate the selected remedial action.
5. Corrective Measures Report. This report:
- a. Must document the construction/installation of the approved remedial action. As-built drawings must be contained in this report, as well as documentation of all efforts that went into the construction/installation of the remedial action.
 - b. Will be very important in the future, as it will document the approved remedial action was properly constructed/installed.
6. Corrective Measures Completion Report. This report must
- a. Be developed once all corrective measures have been completed and the approved remediation objectives have been achieved.
 - b. Document the actual operation of the constructed/installed remedial action over the course of time it was operated;
 - c. Contain the results of the sampling/analysis effort conducted to verify that the remediation objectives have been achieved or (if the unit was closed as a landfill) contain documentation that the unit received appropriate post-closure care.

4.0 Procedures for Proposing Other Alternative Corrective Action Processes

Illinois EPA understands that there may be other alternative procedures for implementing a RCRA corrective action program at a facility. If a facility desires to use such an alternative program, then a formal submittal should be made to Illinois EPA for review and approval which describes the proposed process. This submittal should contain the following information:

1. An introductory section giving a general background about the facility and the purpose of the submittal.
2. Basic background information about the SWMUs/AOC and other areas of concern which will be addressed during the corrective action program.
3. A detailed discussion of the proposed process for carrying out the corrective action program. This discussion should focus on:
 - a. The goals of the process;
 - b. The steps which will be followed in implementing the program;
 - c. How the proposed process will achieve the proposed goals;
 - d. How the proposed process will meet the requirements of 35 IAC 724.201;
 - e. References used to develop the proposal (identify actual location of information using within the document referenced)

Once such information is submitted to Illinois EPA, the facility and Illinois EPA should have a meeting to discuss the proposed process.