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## FACT SHEET

# RCRA: SUBTITLE C CORRECTIVE ACTION

"The Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) were enacted into law on November 8, 1984. One of the major provisions (Section 3004(u)) of these amendments requires corrective action for releases of hazardous waste or constituents from solid waste management units (SWMUs) at hazardous waste treatment, storage, or disposal facilities. Under this provision, any facility applying for a RCRA hazardous waste management facility permit will be subject to a RCRA Facility Assessment (RFA). The RFA is conducted by the regulatory agency and is designed to identify SWMUs which are, or are suspected to be, the source of a release to the environment. If any such units are identified, the owner or operator of the facility will be directed to perform a RCRA Facility Investigation (RFI) to obtain information on the nature and extent of the release so that the need for interim corrective measures or a Corrective Measures Study can be determined. Information collected during the RFI can also be used by the owner or operator to aid in formulating and implementing appropriate corrective measures. Such corrective measures may range from stopping the release through the application of a source control technique to a full-scale cleanup of the affected area. In cases where the releases are sufficiently characterized, the regulatory agency may require the owner or operator to collect specific information needed to implement corrective measures during the RFI." (USEPA, Interim Final RFI Guidance Document, May 1989).

### REGULATORY BACKGROUND

The primary objective of the RCRA corrective action program is to cleanup releases of hazardous waste or hazardous constituents at treatment, storage, or disposal facilities subject to Subtitle C of RCRA. The 1984 Hazardous and Solid Waste Amendments (HSWA) provided EPA with broad and expanded authorities for ensuring corrective action at facilities subject to RCRA.

EPA is now placing greater emphasis on its Corrective Action Program. The Office of Solid Waste and Emergency Response: Annual Report, Fiscal Year 1988 (EPA/68-01-7259, November 1988) reported the following progress regarding Corrective Action:

"The HSWA corrective action authorities greatly expanded EPA's ability to ensure that owners and operators correct releases resulting from past waste management practices at RCRA facilities. In FY 1988, the Regions undertook the following activities to implement the corrective action program: RCRA Facility Assessments (RFAs) were conducted at 228 land disposal facilities, 40 incinerators, and 85 storage facilities. In addition, RCRA Facility Investigations (RFIs) were initiated or in progress at 87 land disposal facilities 8 incinerators, and 15 storage facilities. A new corrective action measure is being developed for the Strategic Planning and Management System (SPMS) that will assist in tracking the number and progress of RFIs underway.

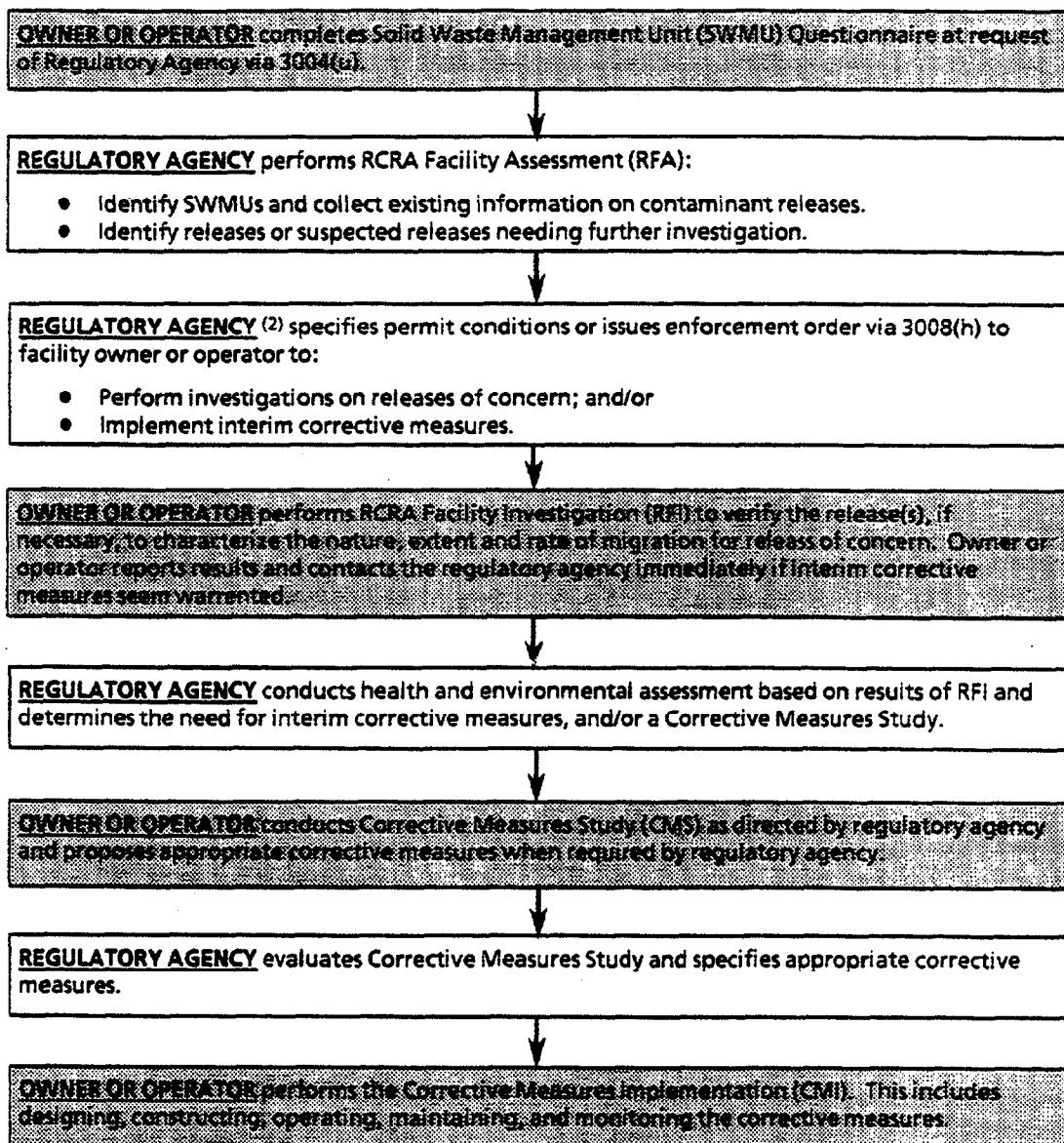
In FY 1988, the RCRA enforcement program made substantial progress in effectively using the Section 3008(h) authority for corrective action. Regions issued 20 consent orders and 5 unilateral orders. In addition, seven Regions were delegated authority for issuing consent orders (Regions 3, 4, 5, 6, 8, 9, and 10), while Regions 4, 8, and 9 also received authorization for issuing unilateral orders. The Section 3008(h) model consent order was made final, and is in use throughout the Regions. A draft model unilateral order is in use and is expected to be finalized in early FY 1989."

### CORRECTIVE ACTION PROCESS

The RCRA Corrective Action Process consists primarily of the following four steps: the RCRA Facility Assessment (RFA), the RCRA Facility Investigation (RFI), the Corrective Measures Study (CMS), and Corrective Measures Implementation (CMI) as shown on the following page.

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### RCRA CORRECTIVE ACTION PROCESS(1)



- (1) Although certain aspects of the Corrective Action Process are the responsibility of the regulatory agency or the owner or operator, close coordination between the regulatory agency and the owner or operator is essential throughout the process.
- (2) Facility will review permit conditions and 3008(h) enforcement order and propose via negotiations, revisions if deemed appropriate.

NOTE: Above flow chart modified from EPA 530/SW-89-031, Interim Final RCRA Facility Investigation (RFI) Guidance Document, May 1989

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In summary, the consent order will delineate the SWMUs requiring corrective action, establish work to be performed, establish investigatory schedules to complete the work (IM, RFI, and CMS), establish penalties for noncompliance and identify facility lines of authority and accountability. The Consent Order remains in effect through completion of the CMS. Corrective action implementation is performed via a new consent order, a modification to the original consent order or as part of the permit.

## RCRA FACILITY INVESTIGATION (RFI)

The RFI can range widely from a small specific activity to a complex multi-media study. In general, the RFI objectives include:

- Characterize the potential pathways of contaminant migration.
- Characterize the source(s) of contamination.
- Define the degree and extent of contamination.
- Identify actual or potential receptors.
- Support the development of alternatives from which a corrective measure(s) will be selected.

The investigation may initially involve verification of suspected releases. If confirmed, further characterization of such releases will be necessary. This characterization includes identification of the type and concentration of hazardous waste or hazardous constituents released, the rate and direction at which the releases are migrating, and the distance over which releases have migrated. Intermedia transfer of releases (e.g., volatilization of hazardous constituents from contaminated soils to the air medium) should also be addressed during the RFI, as appropriate.

The RFI also includes interpretation by the regulatory agency of release characterization data to established health and environmental criteria to determine whether a CMS is necessary. This evaluation is crucial to the RCRA Corrective Action Process. The regulatory agency will ensure that data and information collected during the RFI adequately describe the release and can be used with a high degree of confidence to make decisions regarding the need for a CMS.

The RFI strategy will be specific to each facility and, at the facility level, to each SWMU (or grouping of related SWMUs). Factors which will influence the strategy and its ultimate complexity include, for example, the following:

- Extent of existing information
- Site complexity (hydrogeology, geology)
- Number/diversity of SWMUs
- Number/diversity of areas of contamination
- Affected media/intermedia contaminant transfer
- Offsite contamination
- Exposed/potentially exposed populations
- Sensitive ecosystems/endangered species
- Community relations
- Financial considerations
- Cooperative Nature of Facility
- Investigation Logistics

The RFI will most likely be conducted in phases in order to better focus each field activity.

## INTERIM MEASURES (IM)

Identifying and implementing interim corrective measures may also be conducted during the RFI. If, in the process of conducting the investigation, a condition is identified that indicates that adverse exposure to hazardous constituents is presently occurring or is imminent, interim corrective measures may be needed. Both the owner or operator and the regulatory agency have a continuing responsibility to identify and respond to emergency situations and to define priority situations that warrant interim corrective measures. The need for consideration of interim corrective measures, if identified by the owner or operator should be communicated to the regulatory agency at the earliest possible time. As indicated earlier, the need for interacting closely with the regulatory agency is very important, not only for situations discussed above, but also to ensure the adequacy of the data collected during the RFI and the appropriate interpretation of those data.

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### CORRECTIVE MEASURE STUDY (CMS)

If the potential need for corrective measures is identified during the RFI process, the owner or operator is then responsible for performing a CMS. During this step of the Corrective Action Process, the owner or operator will identify, and recommend as appropriate, specific measures to correct the release. Information generated during the RFI will be used not only to determine the potential need for corrective measures, but also to aid in the selection and implementation of these measures. Selection and implementation of corrective measures will be addressed in future regulations to be developed by EPA. In the interim, guidance for corrective measures selection is provided in several references, including the following:

U.S. EPA. September, 1986. Data Requirements for Remedial Action Technology Selection. Final Report. NTIS PB87-110813. Office of Emergency and Remedial Response and Office of Research and Development Washington, D.C. 20460.

U.S. EPA. October, 1985. Handbook of Remedial Action at Waste Disposal Sites. EPA/625-6-85-006. Office of Emergency and Remedial Response. Washington, D.C. 20460.

U.S. EPA. June, 1985. Guidance on Feasibility Studies Under CERCLA. NTIS PB85-238590. Office of Emergency and Remedial Response. Washington, D.C. 20460.

U.S. EPA. June, 1987. RCRA Corrective Action Interim Measures. Interim Final. OSWER Directive No. 9902.4. Office of Waste Programs Enforcement. Washington, D.C. 20460.

U.S. EPA. May, 1985. Guidance Document for Cleanup of Surface Tanks and Drum Sites. OSWER Directive 9380.0-03. Office of Emergency and Remedial Response. Washington, D.C. 20460.

U.S. EPA. June, 1986. Guidance Document for Cleanup of Surface Impoundment Sites. OSWER Directive No. 9380-0.06. Office of Emergency and Remedial Response. Washington, D.C. 20460.

U.S. EPA. November, 1986. EPA/540/2-85/004. OSWER Directive No. 9380.0-05.

### CORRECTIVE MEASURES IMPLEMENTATION (CMI)

CMI includes designing, constructing, operating, maintaining, and monitoring selected corrective measures. Selection and implementation of corrective

measures will be addressed in future regulations and in separate guidance to be developed by EPA. It is anticipated that the CMI will closely follow the CERCLA/Superfund procedures for remedial action implementation.

### GLOSSARY

CMI	Corrective Measures Implementation - the design, construction, operation, maintenance and monitoring of the selected corrective measure.
CMS	Corrective Measures Study - Identifies specific measure to correct the release and cleanup affected media.
HSWA	Hazardous and Solid Waste Amendments to the RCRA enacted into law November 8, 1984.
RFA	RCRA Facility Assessment - Identifies SWMUs and associated releases or suspected releases needing further investigation. Makes recommendations for Corrective Action, if needed.
RFI	RCRA Facility Investigation - Studies nature, rate and extent of releases. Ranges from small specific activity to a complex multi-media study.
Section 3004(u)	Corrective Action for Continuing Releases. Requires that permits issued after the date of enactment of HSWA (November 8, 1984) require corrective action for releases of hazardous waste or constituents from any SWMU at any hazardous waste TSD facility seeking a permit, regardless of the time of which waste was placed in the unit.
Section 3004(v)	Corrective Action beyond the Facility Boundary. Authorizes EPA to require that corrective action be taken by the facility owner or operator beyond the facility property boundary.
Section 3008(h)	Interim Status Corrective Action Orders. Authorizes EPA to issue orders requiring corrective action or to take other appropriate response measures to protect human health and the environment based on any information that there is or has been a release of hazardous waste into the environment from a facility authorized to operate under Section 3005(e).
SWMU	Solid Waste Management Unit - Any discernible unit at which solid or hazardous waste have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous wastes.

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Response to agency comments is frequently required, and, in most instances, negotiation is also required to arrive at an RFI that is acceptable to all parties. NUS can negotiate directly with the respective agencies as a third party, assist the owner in his negotiation efforts as his technical representative at meetings with the agencies, or provide technical advisement to the owner without actually participating in meetings.

### RCRA FACILITIES INVESTIGATION (RFI)

NUS has ample technical expertise, experience and resources to effectively implement the approved, RFI plan. NUS most commonly implements RFI Plans on a turnkey basis. However, NUS is sufficiently flexible to provide individual component implementation to suit an owner's needs. With the exception of procedures requiring specialized equipment (such as drilling) and/or technology (such as high resolution seismic exploration), NUS provides all implementation services in-house, including laboratory analysis. Field work is personally supervised by experienced field geologists and/or field engineers according to the nature of the work performed.

All field work and data analysis is performed under strict quality assurance/quality control (QA/QC) procedures in accordance with EPA and state guidance. In this way NUS is able to validate data generated and data analysis, and to defend subsequent conclusions drawn.

Normally NUS concludes the RFI plan implementation with a comprehensive report prepared in such a manner as to be presentable to the EPA/state as documentation of meeting the RFI requirement. The report includes a description of the work performed and procedures used, the results of the investigation, conclusions drawn, and NUS' recommendations for future actions.

### RISK ASSESSMENT

The regulatory agency will prepare a health and environmental assessment based on the results of the RFI. Frequently, facilities prefer to concurrently prepare a similar document independently, or after negotiation, in place of the EPA document. NUS has performed numerous risk assessments to evaluate the risk to the public health and environment by constituents of concern. The risk assessment is then a basis for

determining whether a corrective action is necessary, and if so, what cleanup levels will be acceptable (e.g., MCL or ACL). The risk assessment, therefore, is an important component of Corrective Action evaluation and can greatly effect the cost of cleanup.

### CORRECTIVE MEASURES STUDY (CMS)

The primary objective of requiring an RFI is to determine whether a hazardous constituent release has occurred at a SWMU, and, if so, to institute corrective action (measures) to mitigate the release. If the results of the RFI indicate that a release has occurred, the owner is required to perform a Corrective Measure Study (CMS) to determine what corrective actions are required to protect human health and the environment. In many ways, the CMS is analogous to the Feasibility Study part of a Remedial Investigation/Feasibility Study (RI/FS) performed for CERCLA sites.

NUS has extensive experience in performing RI/FS projects for both RCRA and CERCLA facilities. NUS has prepared CMS programs that are equitable to the owner and acceptable by the EPA and authorized State agency. The programs are presently in various stages of implementation.

### CORRECTIVE MEASURES IMPLEMENTATION (CMI)

When a CMS is completed and corrective action is required, the owner must design, construct, operate, maintain and monitor corrective measures selected as a result of the CMS. This requirement is known as Corrective Measures Implementation (CMI). Regulations and guidance for implementation of corrective measures have not been developed by EPA. Consequently, selection of corrective measures and CMI is a process of case by case negotiation with authorized state agencies and EPA.

NUS has performed construction management (including project control and onsite construction management) and corrective measures construction. NUS can provide these services on a turnkey basis or in any combination that would suit an owner's specific needs.