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Ohio EPA
Division of Hazardous Waste Management

Corrective Action Handbook

February 2005

Updated June 2009
Appendix C DHWM Guidance on Accomplishing the Performance Measures for Facilities in U.S. EPA's 2020 Corrective Action Universe has been updated.

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List of Acronyms

ANPR	Advanced Notice of Proposed Rulemaking
CAP	Corrective Action Plan
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response Compensation Liability Act
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CO	Central Office
CSM	Conceptual Site Model
DDAGW	Division of Drinking and Ground Waters
DERR	Division of Emergency and Remedial Response
DHWM	Division of Hazardous Waste Management
DO	District Office
EDQL	Ecological Data Quality Level
ELCR	Excess Lifetime Cancer Risk
EI	Environmental Indicator
ERAC	Environmental Review and Appeals Commission
ERAS	Engineering and Remediation Assistance Section
FAQ	Frequently Asked Questions
FR	Federal Register
GPRA	Government Performance and Results Act
HSWA	Hazardous and Solid Waste Amendments
HWIR	Hazardous Waste Identification Rule
LDR	Land Disposal Restriction
MTR	Minimum Technology Requirements
NCAPS	National Corrective Action Prioritization System
NCP	National Contingency Plan
PIC	Public Interest Center
PMP	Project Management Plan
QAPP	Quality Assurance Project Plan
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RISS	Regulatory and Information Services Section
RFI	RCRA Facility Investigation
TRT	Technical Review Team
TU	Temporary Unit
WMU	Waste Management Unit

Introduction

Purpose

The Ohio Corrective Action Plan (CAP) provides the framework for the Division of Hazardous Waste Management (DHWM) implementation of the RCRA Corrective Action program. The Ohio CAP is a streamlined version of U.S. EPA's CAP and takes advantage of flexibility in the U.S. EPA's CAP. The Ohio CAP recommends use of a site specific approach to implementing the Corrective Action program, meaning that no two projects will follow exactly the same path, and that the Ohio EPA project coordinator and facility have the flexibility to choose the best path to results based on site circumstances. To aid in implementing the flexible, site specific process envisioned by the Ohio CAP, Ohio EPA DHWM has developed this handbook. This handbook is not a recipe for conducting a Corrective Action project but provides 1) background information on the RCRA Corrective Action program; 2) suggested project management tools; and 3) a comprehensive resource list of available technical guidance; all of which can assist DHWM staff assigned to manage Corrective Action projects.

Handbook Organization

This handbook contains five sections:

Policy and Guidance Milestones
Project Management Principles
Project Management Tools
Project Administrative Procedures
Frequently Asked Questions

The Policy and Guidance Milestones section gives insight into the development of Corrective Action since the Hazardous and Solid Waste Amendments (HSWA) of 1984. The next section, Project Management Principles, identifies the fundamental principles on which a successful project can be built. An assortment of tools that can be used to maintain these principles is provided in the Project Management Tools section. Project Administrative Procedures are provided to aid in accomplishing specific administrative tasks. The Frequently Asked Questions (FAQ) section was generated from questions submitted by the district offices. Where a specific answer to a question is not possible, important points for consideration are provided. From this, the project coordinator can make an informed decision as to what is appropriate for the site in question. Following the FAQ section, a glossary of Corrective Action terms is provided. Appendix A presents a list of Corrective Action guidance documents with links to web pages where the guidance documents may be downloaded. Appendix B provides a boiler plate Project Management Plan and an example of a plan. Appendix C contains the DHWM Guidance on Accomplishing the Performance Measures for Facilities in U.S. EPA's 2020 Corrective Action Universe. U.S. EPA created event codes that must be entered into RCRAInfo for various Corrective Action events. These codes are explained in Appendix D Nationally Defined Values for Corrective Action Event Code.

Handbook Limitations

This handbook is not a step-by-step procedure for reviewing Corrective Action projects. It does not contain guidance on such specific topics as content of RFI work plans. For that type of information, the user must go to the Ohio CAP, the U.S. EPA CAP or to other guidance documents listed in Appendix A of this handbook. While the FAQ and administrative procedures sections are quite comprehensive, they cannot possibly contain every question and answer related to Corrective Action. Additional Corrective Action procedural/technical questions should be directed to the supervisors or manager of the Central Office Engineering and Remediation Assistance Section.

Guidance and Policy Milestones

Although the requirement to perform Corrective Action is mandated by statute, the development of the details of the Corrective Action program has primarily been through a series of policy statements and guidance documents issued by U.S. EPA. This section summarizes the significant policy/guidance documents and will address why they were initiated, what they contain, and why they are still important. This will provide the reader with an overview of the Corrective Action program.

Hazardous and Solid Waste Amendments of 1984

In writing HSWA, Congress significantly broadened the Corrective Action authority of U.S. EPA. Congress noted that one of the chief purposes of HSWA was to ensure that current RCRA facilities do not become future abandoned sites subject to the Federal Superfund program administered under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Congress believed that the burden of cleanup of these sites should lie with the owners of the property, and should not be transferred to the government [1]. Before HSWA, U.S. EPA required ground water Corrective Action for certain regulated units (i.e., surface impoundments, landfills, land treatment units, or waste piles which received hazardous waste after July 26, 1982) under 40 CFR part 264. HSWA added section 3004(u) to RCRA to require Corrective Action for all releases of hazardous waste or constituents from any waste management unit, regardless of the time of placement of the waste. As a result, U.S. EPA was authorized to address releases to air, surface water, ground water, and soils where necessary to protect human health and the environment. Also provided for in HSWA was the requirement to address releases beyond the facility boundary, and an omnibus authority for U.S. EPA to create "such terms and conditions as the Administrator (or State) determines necessary to protect human health and the environment" [2]. U.S. EPA announced the promulgation of final Corrective Action requirements in July 1985 [29] and December 1987 [30].

1990 Proposed Subpart S Rulemaking

In July 1990, U.S. EPA proposed a set of detailed Corrective Action regulations [5]. Analogous to the CERCLA National Contingency Plan (NCP), these proposed rules were both technically and procedurally specific. However, U.S. EPA recognized that flexibility was necessary for the Corrective Action program to succeed. The proposed rules provided some site specific flexibility to decision makers for such items as cleanup levels and extent of investigation [3]. This proposed rulemaking generated significant public comment, and most of the rules were never finalized [4]. In October 1999, U.S. EPA withdrew portions of the proposed rule that were never finalized [31]. The 1990 proposed Subpart S has found use as guidance, however, and receives credit for defining several keys terms and acronyms now associated with Corrective Action, such as RCRA Facility Assessment (RFA) and RCRA Facility Investigation (RFI).

1991 Stabilization Initiative

By the late 1980's, U.S. EPA had begun to realize that focusing on final remedies at only at few facilities drained resources to address cleanups at other facilities. If resources were reallocated such that imminent threats were addressed at all facilities before addressing final cleanups at any one facility, current risks could be eliminated expeditiously. U.S. EPA introduced this concept in a guidance memorandum entitled "Managing the Corrective Action Program for Environmental Results: The RCRA Facility Stabilization Initiative" [6]. This directive established the Stabilization Initiative as one of the primary implementation objectives of the Corrective Action program. The goal of the Stabilization Initiative was to "increase the rate of Corrective Actions by focusing on near term activities to control or abate threats to human health and the environment or minimize the further spread of contamination". The Stabilization Initiative works by achieving stabilization across many facilities, rather than final actions at fewer facilities. Stabilized sites should not pose current unacceptable threats, and stabilization measures should be consistent with final remedial actions when possible. Further investigation or remediation may

be required in the future, but once stabilized; both the Agency and the owner/operator can shift resources to other threats, either at the facility or at another facility [7].

In order for the Stabilization Initiative to be effective, a prioritization system for assessing the relative environmental cleanup priority of RCRA facilities was developed. This system was created in 1991 and was named the National Corrective Action Prioritization System (NCAPS). NCAPS uses standardized scoring procedures to rank Corrective Action facilities as high, medium, or low priority for Corrective Action based on hydrogeology, release history, waste type and quantity, exposure potential, and continuing releases. This ranking, along with other factors, is then used to prioritize subject facilities for Corrective Action [8].

1993 Corrective Action Management Unit (CAMU) and Temporary Unit (TU) Rulemaking

The CAMU/TU rule, proposed in 1990, created a new type of RCRA unit allowing permitted facilities the flexibility to consolidate and treat contaminated soil and debris. This rule eased the burden of complying with RCRA rules regarding waste generation, land disposal restrictions (LDRs), and minimum technology requirements (MTRs). CAMUs and TUs could be created using site specific design, operating, closure, and post-closure requirements, and were not subject to LDRs and MTRs [9]. The 1993 final rule relaxed management standards for remediation waste when consolidated into a CAMU. The significance of this rulemaking, besides a reduction in regulatory burden, is that it shows U.S. EPA's commitment to developing a Corrective Action program that is flexible. The CAMU/TU rule was challenged in court. In October of 1994, U.S. EPA and the litigants agreed to stay the CAMU suit while U.S. EPA was developing the Hazardous Waste Identification Rule (HWIR) for contaminated media. At the time, the HWIR media rule was expected to replace the CAMU rule. This is reflected in the language of the 1996 Advanced Notice of Proposed Rulemaking (ANPR) for Corrective Action [10]. On November 30, 1998, U.S. EPA issued the HWIR media rule in final form, and did not rescind the CAMU/TU rule [11]. A settlement in the litigation was finally reached in February 2000. As a result, on August 22, 2000, the U.S. EPA proposed changes to the CAMU rule; and a final rule was published on January 22, 2002 at 67 FR 3025.

1994 Environmental Indicators

Ten years after HSWA was enacted, the Corrective Action program was beginning to come under criticism for being too process-oriented. Critics of the program pointed out that even program management was focused on the Corrective Action process rather than achieving results; it could be seen in the tracking of projects by using plan submittal and approvals as milestones rather than actual environmental benefits achieved. The Government Performance and Results Act (GPRA) of 1993 mandated that Federal Agencies develop and use a means of measuring results [12]. In response, the Agency created two new RCRAInfo event codes, the Corrective Action Environmental Indicators. The Environmental Indicators would be tracked for a select list of facilities, called the GPRA Baseline, with specific performance goals specified for facilities on the baseline. RCRAInfo codes CA725, Human Exposures Controlled, and CA750, Ground Water Releases Controlled, are the two environmental indicators developed by U.S. EPA in an attempt to satisfy GPRA requirements and refocus the Corrective Action program from deliverables to attainment of these performance measures [13]. This not only focuses Corrective Action on these performance objectives rather than administrative steps, but also gives a better picture of the actual status of the conditions at a site.

1994 U.S. EPA Corrective Action Plan (CAP)

While the Environmental Indicators created a new focus on documenting results over process, the U.S. EPA Corrective Action plan was designed to promote consistency in the program [14]. While site specific flexibility was mentioned in the 1990 proposed rules, and would soon again be stressed in the 1996 Advanced Notice of Proposed Rulemaking (ANPR), the U.S. EPA still needed to ensure that all cleanups achieved the same level of protectiveness [15][16] . The U.S. EPA CAP presented model scopes of work for activities which may be required at any Corrective Action site; these models are to be used as

guidance when developing site specific scopes of work, not as cleanup prescriptions [17]. The CAP is valuable because it gives the level of detail and content that should be addressed in the various Corrective Action work plans.

1994 Subpart S Initiative

Discussed in Part II of the 1996 Advanced Notice of Proposed Rulemaking (ANPR), the Subpart S Initiative was developed "to identify and implement improvements to the protectiveness, responsiveness, speed and efficiency of the Corrective Action program, and to focus the program more clearly on environmental results" [19]. This was in partial response to critics who said the program was too slow in achieving results, emphasized process over results, unrealistic cleanup goals, excessive oversight, and a lack of meaningful public participation [20]. The Subpart S Imitative was to identify improvements through outreach to stakeholders, create new guidance, including the 1996 ANPR, finalize portions of the 1990 proposed rules, and even went as far as to say that new rules would be proposed in the fall of 1997 [21].

Five Subpart S objectives were identified for the initiative: (1) create a consistent, holistic approach to cleanups at RCRA facilities; (2) establish protective, practical cleanup expectations; (3) shift more of the responsibilities for achieving goals to the regulated community; (4) focus on opportunities to streamline and reduce costs; and (5) enhance opportunities for timely, meaningful public participation. EPA noted that to achieve these objectives may require new approaches; however any new approaches would not jeopardize human health or the environment [22].

Also discussed in the initiative was the close relationship the Corrective Action program should have with the CERCLA Superfund program's improvements and reform. This included several reforms which apply equally to Corrective Action as they apply to Superfund: (1) guidance on future land use determinations; (2) the 1996 Superfund soil screening guidance; (3) presumptive remedies; and (4) community based remedy selection. In general, and as discussed in the ANPR, both the RCRA and CERCLA cleanup programs should share the same objectives and achieve the same results (i.e., the concept of parity). This would include utilizing the same guidance documents to aid in decision making for either program [23].

1996 Advanced Notice of Proposed Rulemaking (ANPR)

Arguably the most significant statement of U.S. EPA Corrective Action policy, the May 1, 1996 ANPR introduced the Agency's strategy for identifying and developing improvements to the program [24].

The ANPR is divided into five parts. Part I describes the regulatory and statutory basis of the Corrective Action program. Part II introduces the Subpart S Initiative. As the most useful part of the ANPR, Part III discusses the evolution of the Corrective Action program since 1990, outlines the Agency's program management philosophy, and provides guidance on many key issues central to Corrective Action. The fourth part articulates Corrective Action implementation goals and strategies, and Part V requests comments on the previous four parts of the ANPR.

The ANPR stresses the need for site specific flexibility in Corrective Action, while still maintaining a level of consistency in results achieved across the nation. To achieve this, seven basic operating principles guide Corrective Action implementation. They are (1) Corrective Action decisions should be based on risk; (2) program implementation should focus on results; (3) interim actions and stabilization should be used to reduce risks and reduce exposures; (4) activities at Corrective Action facilities should be phased; (5) program implementation should provide for meaningful inclusion of all stakeholders; (6) Corrective Action obligations should be addressed using the most appropriate tool for any given facility; and (7) states will be the primary implementers of the Corrective Action program [25].

The ANPR is not a rule, and is not binding on either the Agency or the regulated community. It is, however, a statement of U.S. EPA's expectations for the future of the Corrective Action program, after fifteen years of project experience. The 1996 ANPR should be used as guidance for implementing the

Corrective Action program. This is reiterated in a 1997 memorandum entitled "Use of the Corrective Action Advance Notice of Proposed Rulemaking as Guidance", and again in the 1999 RCRA cleanup initiative.

1998 Post-Closure Rule

Two sets of RCRA requirements (closure and Corrective Action) can apply to the same release, if both regulated units and Waste Management Units (WMUs) have contributed to the release. The post-closure rule provides flexibility to regulators to address ground water monitoring, closure and post-closure and financial assurance requirements for regulated units under Corrective Action under the following conditions:

- The hazardous waste management unit is situated among WMUs or areas of concern, a release has occurred, and both the unit and the WMUs are likely contributors to the release; and

- The regulating authority determines that applying the hazardous waste closure and ground water monitoring requirements for post-closure care is not necessary because the cleanup remedy developed through the Corrective Action process is deemed to be protective; or

- The remedy selected will satisfy the RCRA closure performance standards.

The alternate standards for closure, post-closure, ground water monitoring, and financial assurance must be issued in the facility's permit, or within another enforceable document. The goal of this final rule was to eliminate some of the inefficiency of meeting two different regulatory requirements [28].

1999 RCRA Cleanup Initiative

Several program management philosophies were reiterated in the 1999 RCRA Cleanup Initiative. The following major points regarding program implementation were conveyed at the 1999 RCRA national meeting and Corrective Action workshop:

- No new Corrective Action rules. Contrary to the 1996 ANPR, U.S. EPA said that it would not promulgate new Corrective Action rules any time in the near future. The program was to be managed via directives, existing guidance, and the creation of new guidance.

- Re-affirmed ANPR as guidance. Citing the Elliot Laws 1997 memorandum, U.S. EPA reaffirmed that the 1996 ANPR represents the Agency's most current position on many central issues and is to be used as guidance.

- Re-affirmed Environmental Indicators. Although the Environmental Indicators (EIs) changed slightly from the 1994 introduction (they are now known as "Current Human Exposures Under Control" and "Migration of Contaminated Ground Water Under Control") U.S. EPA indicated that attainment of the two EI is the highest priority for the Corrective Action program [27].

- Established workshops, fact sheets and Internet training.

- Re-affirmed remedial expectations. U.S. EPA restated its expectations for final remedies at Corrective Action facilities in an effort to help focus investigations and remedy selection. These expectations included: using treatment to address principle threats; return ground water to its maximum beneficial use; use engineering controls for wastes which are easily contained, low-threat, or for which treatment is impracticable; use a combination of methods to achieve protection of human health and the environment; use institutional controls to supplement engineering controls; use innovative technology where possible; and remediate contaminated soils to eliminate exposure and contaminant migration potential.

- Refined threshold and balancing criteria. In the ANPR, U.S. EPA identified the threshold and balancing criteria to be used in remedy selection at Corrective Action sites. The 1999 cleanup initiative changed this to the "Remedy Performance Standard" and "Evaluation/Balancing Criteria". The new remedy performance standard consisted of the following: protect human health and the environment; attain media cleanup objectives for current and reasonably anticipated land uses; and remediate the sources of releases so as to reduce or eliminate, to the extent practicable, further releases that might pose threats, using treatments to address principal threats. All final remedies must meet the performance standards. Evaluation/ Balancing criteria are to be considered after attainment of the performance standards. They include: long-term reliability and effectiveness; reduction of toxicity, mobility, and volume through treatment; short-term effectiveness; implementability; cost; community acceptance; and state acceptance.

2003 Final Guidance on Completion of Corrective Action Activities at RCRA Facilities

The RCRA rules do not provide explicit procedures for recognizing that Corrective Action has been completed. Consequently, on February 13, 2003, U.S. EPA issued final guidance on completion of Corrective Action, that is, on determining that the "protection of human health and the environment" standard in 40 CFR 264.101 and RCRA Section 3008(h) has been met. The guidance identifies two types of completion determinations: (1) Corrective Action complete without controls and (2) Corrective Action complete with controls. There can be "complete without controls" and "complete with controls" determinations for different areas at the same facility. A completion determination can be made for part of a facility while Corrective Action activities are continuing for the remainder of the site. A Corrective Action that is complete with controls must have an enforceable mechanism such as a permit or an order. The guidance describes general procedures for completion determinations, including public involvement and permit modification and termination.

2004 Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action

In April 2004, U.S. EPA issued an updated version of its 2001 handbook discussing important ground water issues in the Corrective Action program [33]. The 2004 handbook, which has Internet links to more detailed resources, contains U.S. EPA's interpretation of policies on topics such as:

- Ground water protection and cleanup strategy
- Short-term ground water protection goals
- Intermediate ground water performance goals
- Final ground water cleanup goals
- Ground water cleanup levels
- Point of compliance
- Cleanup time frame
- Source control
- Ground water use designations
- Institutional controls
- Monitored natural attenuation
- Technical impracticability
- Reinjection of contaminated ground water
- Performance monitoring
- Completing ground water remedies.

Corrective Action in Ohio

Ohio became authorized for implementing the Corrective Action program through permits on December 23, 1996. Before that date Corrective Action activities within the state were led by U.S. EPA, with DERR and DHWM in supporting roles. To receive program authorization from U.S. EPA, Ohio EPA submitted an application that provides a program description and commitment to perform certain tasks.

The Ohio Administrative Code (OAC) contains requirements for Corrective Action at facilities with hazardous waste installation and operation permits. This rule reads as follows:

> OAC Rule 3745-54-101
> Corrective action for waste management units.
>
> (A) The owner or operator of a facility seeking a permit for the treatment, storage, or disposal of hazardous waste must institute corrective action as necessary to protect human health and the environment for all releases of hazardous waste or constituents from any waste management unit at the facility, regardless of the time at which waste was placed in such unit.
>
> (B) Corrective action will be specified in the permit in accordance with this rule and with rules 3745-57-70 to 3745-57-75 of the Administrative Code. The permit will contain schedules of compliance for such corrective action (where such corrective action cannot be completed prior to the issuance of the permit) and assurances of financial responsibility for completing such corrective action.
>
> (C) The owner or operator must implement corrective actions beyond the facility property boundary, where necessary to protect human health and the environment, unless the owner or operator demonstrates to the satisfaction of the Director that, despite the owner's or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such actions. The owner/operator is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where offsite access is denied. Onsite measures to address such releases will be determined on a case-by-case basis. Assurances of financial responsibility for such corrective action must be provided.

For order driven Corrective Action, the authority stems from the statute. Ohio EPA implements Corrective Action by including terms and conditions for Corrective Action in each new or renewal permit, using the model permit language for Module E that is posted on the DHWM intranet site. This is done as hazardous waste permit applications are reviewed and permit language is developed. In addition, a limited amount of Corrective Action orders are issued each year, in accordance with a joint plan entered into between DHWM and U.S. EPA.

To aid in initial implementation of the Corrective Action program, an Ohio CAP was developed. This CAP outlined a flexible, site specific approach to Corrective Action, using various elements from the Federal program. Today the Ohio CAP and U.S. EPA CAP are used when designating the specific requirements in a permit or order for any given facility.

It is not unusual for a facility to be simultaneously remediating WMUs under Corrective Action and regulated hazardous waste units under RCRA closure. In some cases, the WMU and the closure unit cannot be easily distinguished because unit boundaries overlap, contaminant plumes are commingled, or it is difficult to identify the exact source of the contamination. The U.S. EPA post-closure rule (discussed above), which was adopted by Ohio EPA in December 2004, addresses this situation by allowing the regulated unit to be remediated under Corrective Action. This rule allows the regulating agency to choose whether to apply current 40 CFR Parts 264 and 265 (or OAC Chapters 3745-54 to 3745-205 and 3745-65 to 3745-256) to regulated units closed as a part of a broader Corrective Action or to address them

through the Corrective Action cleanup requirements. However, the post-closure rule is not intended to bring WMUs under the unit specific closure standards.

A facility may satisfy its Corrective Action obligations by cleaning up the property under Ohio EPA's Voluntary Action Program (VAP), provided that the property is eligible for the VAP. The RCRA Corrective Action facilities that are eligible to participate in the VAP are those that are not required to conduct Corrective Action under a permit or are not required to conduct Corrective Action under a federal or state order. Ohio EPA has taken the position that a facility can use either the "classic" VAP or the Memorandum of Agreement (MOA) Track VAP. However, in order to receive "comfort" from U.S. EPA that U.S. EPA will recognize the VAP cleanup as being sufficient to satisfy its Corrective Action objectives, the facility must conduct the cleanup following the MOA Track. The MOA Track VAP provides for public involvement and incorporates document review and oversight of the voluntary action by Ohio EPA. The MOA Track procedures must be followed from the beginning stage through all the steps in the review and approval process necessary to obtain a VAP No Further Action letter. DERR VAP staff provides the document review and oversight for facilities that meet Corrective Action obligations through the VAP. The MOA Track was created by the Brownfields and Voluntary Action Program Memorandum of Agreement between U.S. EPA and Ohio EPA in 2001. On November 8, 2007, the 2001 Agreement was replaced with a similar formal agreement providing federal comfort for eligible Superfund or RCRA Corrective Action properties where a voluntary action has been completed in compliance with the MOA Track.

References

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[15] 61 FR 19440
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[21] 61 FR 19436
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[25] 61 FR 19441

[26] “Use of the Corrective Action Advanced Notice of Proposed Rulemaking as Guidance”, U.S. EPA Office of Solid Waste and Emergency Response, January 17, 1997.
[27] “Interim Final Guidance for RCRA Corrective Action Environmental Indicators”, U.S. EPA Office of Solid Waste, February 5, 1999.
[28] “Postclosure Permit Requirement and Closure Process; Final Rule”, October 22,1998, 63 FR 56710.
[29] 50 FR 28702
[30] 52 FR 45788
[31] 64 FR 54604
[32] 68 FR 8757
[33] “Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Actions”, U.S. EPA Office of Solid Waste, April 2004.

Project Management Principles

Principles are elements essential for producing a desired effect. In Corrective Action, we can identify several project management principles that will lead to success. It is expected that each project coordinator will work to include these principles in every aspect of the Corrective Action project.

The Team Approach

Corrective Action projects often are complex and require involvement of staff with multidisciplinary skills. Seldom does a project coordinator have the necessary technical knowledge or experience to review an entire project individually. It is usually more effective for the project coordinator to use a team approach. The project coordinator may identify staff to be a part of the Technical Review Team (TRT). The idea behind the TRT concept is that by combining the technical expertise, experience, and resources of several team members, Corrective Action projects will become more manageable. Members of the TRT may come from a district office, other district offices, the central office, or even different divisions within Ohio EPA. For example, there would likely be a member from the Division of Drinking and Ground Water (DDAGW) to address hydro-geological issues associated with the site and a member from the Division of Surface Water (DSW) if surface water quality is an issue at the site. Ecological concerns may be addressed by a member who has experience reviewing ecological risk assessments. Central Office's (CO) Engineering and Remediation Assistance Section (ERAS) and possibly legal staff would aid development of environmental covenants. The key is to develop a multidisciplinary team where the knowledge and experience of the members complement each other. To encourage and implement the team approach, each project coordinator should identify potential team members and their roles. This can be done in a Project Management Plan (PMP), which is further described in the tools section of this handbook. Administrative issues associated with formation of the TRT are discussed in the procedures section of the handbook.

Focus on Results

The Ohio CAP suggests that the focus of Corrective Action should be on results and provides the flexibility to tailor the process to site specific circumstances. When working on Corrective Action projects, project coordinators need to make a conscious effort to focus actions on results. This means identifying the key decisions which need to be made and the data necessary to make those decisions, then focusing activities on collecting the required data. There are tools available to help focus Corrective Action projects on results, such as the conceptual site model, problem statements, and decision rules. These are discussed in the tools section.

Effective Communication

Communication between the project coordinator, the facility, the public, and the TRT members is necessary for Corrective Action projects to succeed. Effective communication does not just happen; it must be planned. Project coordinators are expected to plan and implement effective communication strategies. The act of planning out communication, and documenting it in the project management plan, will stimulate the project coordinator's thoughts on this issue.

Communication can benefit us in many ways. When effective, it can be used to gain understanding and agreement between parties; to improve cooperation between the Agency, the facility, and the public; and to improve the pace of plan reviews and decision making. When it is not effective, it can also create problems. Some important points to remember when communicating include:

1) Recognize that different organizations have different values. This will affect each organization's priorities when undertaking Corrective Action. This difference in values can be overcome by understanding the values each organization has.

2) Differences in technical opinions are common. A technique to work through these differences is to identify the underlying assumptions behind the opinions. Tools such as the conceptual site model can be used to help in this area.

3) Communicate early the goals and objectives of the project. Knowing what is expected can go a long way towards progress. Also, understand the goals, objectives, and constraints within which the facility must operate.

4) Use the right tools to communicate. Use letters or emails primarily as follow-up information to phone conversations and to document agreements.

Maintain Objectivity

Managing a Corrective Action project often is not the only job duty staff will perform. Many times the project coordinator is also the facility inspector, permit writer, and closure plan reviewer. The experiences of each of the roles can be difficult to forget. For example, negative feelings stemming from the previous year's inspection may affect the inspector's attitude going into the next year's inspection. This may have an impact on objectivity. Project coordinators must recognize this both in themselves and in other team members, and being professionals, work to maintain objectivity. The project will go much smoother when there is a coordinated effort between the Agency and the facility.

Strong Central Office Support

One of the responsibilities of CO is to provide guidance and technical support to the District Offices (DO). To facilitate this, it is recommended that each Corrective Action project have as a member of the technical review team a staff member from the CO ERAS. The role of this member will be to ensure statewide consistency in the Corrective Action program, and to supply engineering or risk assessment technical support to the project coordinator. When questions arise for which the CO staff member does not have the technical knowledge or experience to answer, they will seek out those who do. This role of ERAS contact should be spelled out in the PMP.

The DO may also request technical review of specific aspects of a project as needed, for example a landfill cover or natural attenuation study. Procedures for requesting short term review assistance are included in this handbook. An electronic form for requesting CO technical assistance is available on the DHWM intranet site.

The CO maintains a repository for Corrective Action guidance documents. These documents are listed in the reference section of this handbook. The documents are available by contacting ERAS staff with a request for a specific document, or by asking about applicability when more than one document is available.

The CO also offers enforcement and managerial support to the DO. The procedures for obtaining support from CO are provided in the project administrative procedures section. It is vital that district staff identify ways in which CO can offer support. Any questions, special needs, or training suggestions should be directed towards the manager or supervisors of ERAS.

Public Participation

Public participation must be accounted for in each phase of the project, including remedy selection and evaluation of anticipated future land use scenarios. The Agency will take a proactive role in public participation, and will encourage the facility to do so also. Some aspects of public participation are required during the permitting process in which most of the current Corrective Action projects will be managed. However, this level of public participation may need to be supplemented with other outreach activities. Project coordinators are expected to identify and implement effective public participation strategies. These strategies should be presented in the PMP, and consist of items such as fact sheets

and public information sessions. Some ideas for enhancing public participation can be found by consulting the RCRA Public Participation Manual. The Public Information Center (PIC) is also available to assist in designing and implementing public involvement activities. PIC should be contacted and involved to some degree in every project, and may even provide a contact to serve on the TRT for especially controversial projects.

Thorough Documentation

Managing the documentation associated with Corrective Action projects is another important function of the project coordinator. Documentation may include field notes, phone conversation records, meeting notes, and document logs. Maintenance of this documentation is important for several reasons. First, Corrective Action typically takes a long time to complete. Couple this with staff turnover and a lack of continuity develops. Without documenting important decision logic in the project, a lot of time can be lost trying to figure out why something was done the way it was done. Another reason for thorough documentation is to record agreements reached during meetings, phone conversations, or in letters. Without this documentation, it could be difficult to reconstruct agreements made, or to find letters received or sent. One tool for maintaining this level of documentation is the project log book described in the tools section.

Achieve Project Remedial Expectations

The Corrective Action program in Ohio is flexible, allowing for site specific decisions on project content and level of effort, as described in the Ohio CAP. However, it is expected that all Corrective Action projects achieve the same level of protectiveness. To maintain statewide consistency, consistency with the Federal program, and to meet Agency objectives, there needs to be a set of minimum remedial expectations. These expectations should be set as either interim or final project objectives, as the situation warrants. Project coordinators are encouraged to discuss these expectations with the facility early and openly, and should focus the project on attaining these results.

- Attain the Agency wide risk goals. Ohio EPA has established Agency-wide risk goals that are applicable to Corrective Action. The risk goal used in Corrective Action projects, independent of the scenario (industrial or residential), is not to exceed a 10^5 excess lifetime cancer risk (ELCR) for carcinogens. The other common measure of risk, the hazard index, must be used for non carcinogenic risks. The goal for non carcinogenic risk is a Hazard Index of less than 1.

- Employ corrective measures that meet the Threshold Criteria and Balancing Criteria. The following four threshold criteria must be met for any corrective measure: (i) protect human health and the environment; (ii) attain media cleanup standards for current and reasonably anticipated land uses;(iii) remediate source(s) of the release to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment; and (iv) comply with applicable standards for management of waste. Once one or more remedies are shown to meet all of the threshold criteria, the following balancing criteria may be used to determine the best remedy: (i) long term reliability and effectiveness; (ii) reduction in toxicity, mobility, or volume of wastes; (iii) short term effectiveness(iv) implementability; and (v) cost.

- Use a combination of engineering controls, treatment, and institutional controls. Ohio EPA expects that for many sites the combination of engineering controls, treatment, and institutional controls may be useful. Principle threat wastes should be treated whenever possible. Principle threat wastes are those that are highly toxic, highly mobile, or cannot be readily contained. Treatment would be used to reduce the toxicity, mobility, or volume of these wastes. Engineering controls may be necessary for relatively immobile wastes, wastes not easily removed or treated, or wastes that do not pose long term threats. Institutional controls, such as land or water use restrictions, normally will only be used to supplement engineering controls and treatment in the short or long term by preventing exposures.

- Attain the Environmental Indicators. In 1993 Congress, through the Government Performance Results Act (GPRA), mandated that U.S. EPA develop and use a means of measuring results in the Corrective Action program. U.S. EPA developed the RCRA Corrective Action Environmental Indicators (EIs) as measures of the progress of this program. Attainment of the EIs, RCRAInfo event codes CA725 and CA750, is currently the highest priority for the Federal Corrective Action program. Guidance on how to document EI attainment was released in February of 1999. The EIs are a good measure of current environmental threats at a facility. Because of that, working to achieve the two EI focuses the project on near-term stabilization of the site. Final remedial objectives can then be established and worked towards.

- Attain ecological cleanup objectives. All Corrective Action projects must be protective of ecological receptors. At times, contaminant concentrations that pose an acceptable risk to humans may not be acceptable for more sensitive ecological receptors. Media cleanup objectives developed for a Corrective Action project must be protective of ecological receptors at the site. Until such time that Ohio EPA has developed a unified waste program including ecological assessment protocols, projects should utilize the Ohio EPA and Region 5 guidance and Ecological Data Quality Levels (EDQL) in decision-making at Corrective Action sites. Ohio surface water regulations rely on the Total Maximum Daily Load (TMDL) program to attain biological, bacterial, physical, and chemical criteria in the state's streams.

- Return ground water to its maximum beneficial use. Ground water is a valuable resource that should be protected and conserved. At a minimum, Ohio EPA expects that exposures to contaminated ground water will be eliminated, further plume migration will be prevented, and ground water contamination sources will be controlled or eliminated. When feasible, contaminated ground water should be restored to its maximum beneficial use within a reasonable time frame.

- Incorporate public participation into the remedy selection process. Public participation is an important part of remedy selection and must be considered during final remedy selection. Remedy selection includes discussions of anticipated future land use scenarios.

Project Management Tools

The project coordinator is tasked with infusing project management principles throughout the project. The purpose of this section of the handbook is to present some easy to use tools that will help the project coordinator apply the principles introduced previously.

Project Management Plan

The Project Management Plan (PMP) is a brief written plan prepared by the Ohio EPA project coordinator. The purpose of the PMP is to stimulate the project coordinator's thoughts on several of the project management principles, specifically how she/he intends to incorporate those principles into the project at hand. The principles addressed in the project management plan include focusing on results, effective communication, public participation, the technical review team, and thorough documentation. Generally, the sooner a PMP is prepared, the better direction the project is likely follow. The PMP should be completed before renewal of permits containing Corrective Action requirements, and before the issuance of orders for order-driven Corrective Action. When owner/operator initiated Corrective Action proceeds ahead of Agency approvals, the PMP may need to be developed much earlier in the process. This way the Agency has a clear plan for managing the project before its implementation. Appendix B of the handbook contains a generic boilerplate PMP, or the project coordinator can develop his/her own format. The plan should contain a brief discussion of project objectives, personnel organization, communication strategy, public participation, and a project schedule, each of which are discussed below.

- Project objectives. The project objectives should be tailored to each individual project, but must include attainment of the remedial expectations as a primary goal. These project objectives should be shared with the facility, in concert with the effective communication principle. When identifying goals for the project, it may be necessary to start out very broad, and recognize that more detailed, or short term, objectives may become apparent later in the project.

- Personnel organization. This section should include a management tree showing all technical review team members. A brief description of the responsibilities of each member also should be noted. Assembling this team often will take the coordination of different schedules and workloads, and usually different supervisors or even divisions. Some may require formal requests and paperwork; others just a phone call. It is not necessary to identify every TRT member at the onset of the project; the project coordinator can wait until they are needed to review a particular aspect of the project. Remember that the PMP is flexible, so new team members can be added later.

- Communication strategy. The purpose of creating a communication strategy is to stimulate thought on how information will flow within the project. An effective tool for summarizing this information is the communication matrix, an example of which can be found in the boilerplate PMP. The specific communication tools used, for example team meetings or conference calls, is left up to the discretion of the project coordinator. All regular modes of communication should be presented in the matrix.

- Public participation. The importance of public participation has been stressed in the principles of project management. Because of that importance, project coordinators need to include a discussion of how they plan to incorporate public participation into decision- making at the facility. Project Coordinators may want to use the 1996 RCRA Public Participation Manual, for it provides ideas for meaningful public participation, and includes a section specific to Corrective Action. Also, as a supplement to the Risk Assessment Guidance for Superfund (RAGS) series, the Federal Superfund program has issued guidance on incorporating public involvement into the risk assessment process. Note that as part of Corrective Action, the facility should be required to prepare a public involvement plan that describes how they will involve the public in the Corrective

Action project. The details of this plan should be included in the permit or order. You may want to coordinate certain agency public involvement activities with this plan, to the degree possible.

The amount of public involvement should be related to the amount of public interest at the site. For permit driven Corrective Action, public participation required by law is built into the permit modification process. Project coordinators must strive to specify more participation than this when it is necessary. Project coordinators should contact PIC for assistance when preparing for public participation.

- Project schedule. The project schedule should be provided, preferably in the form of a simplified Gantt chart. An example is provided in the boilerplate PMP. The information to complete this section generally would come from the compliance schedule in the permit or order.

It should be stressed again that the Project Management Plan is not set in stone, nor should it be completed once and then forgotten. The PMP must be a dynamic document that changes as team members, schedules, or other resources change.

Problem Statements and Decision Rules

Traditional approaches to site investigation and remediation often involve determination of the full nature and extent of contamination, and eliminating all unknown conditions before going on to remedy selection and evaluation. A results-based approach focuses on the specific problems that need to be solved. We can use problem statements and decision rules to better define the problem and focus in on its solution.

Problem statements are a clear, concise format for communicating the condition that needs a response. An example would be: “chromium exists in the shallow soil at concentrations exceeding 400 ppm”. The problem statement is an effective communication tool because it focuses in on what specific problem needs to be addressed. It is linked to key decisions that need to be made by identifying the condition requiring a response, reflecting the current understanding, and evolving with greater understanding of the site.

Decision rules take the concept of problem statements one step further, by providing the response to the problem in an “if-then” type statement. For example: “If chromium exists in soil at greater than 400 ppm, then that soil will be excavated and disposed of off-site”. The response can be general (we will stop ground water migration) or rather specific (we will install nine extraction wells and pump 300 GPD from the aquifer to hydraulically contain the plume). This is a function of the amount of data available. Generally, decision rules are used when the preferred response to the given problem is known.

Conceptual Site Model

The conceptual site model (CSM) is one of the most powerful tools for site investigation. The CSM is a 3dimensional conceptualization of contaminant sources, release and transport mechanisms, routes of migration, and potential receptors. This illustration is used to convey relationships between component parts in a form that enhances the ability to communicate those relationships and use them predicatively.

A tool for communicating technical data, the CSM provides a model of how and where contaminants are expected to move and what impacts that movement may have. It supplies additional information as to why a problem is a problem, why that problem is inconsistent with Corrective Action objectives, and why remedial action is anticipated. By highlighting human receptors and ground water releases, it facilitates EI determinations. It can organize what is known and what needs to be known any point in time. The CSM can also identify and prioritize problems at the facility and prioritize responses based on interim or final goals for the facility.

The CSM is a dynamic tool which should be developed, tested, and refined throughout the entire project, from the earliest investigation through the final remedy completion, so that it reflects the best

interpretation of available data at any point in time. If new data collected are not consistent with existing knowledge, either the data are not valid or the model is wrong and needs to be revised. CSMs can take several forms, and benefit from multiple formats to best communicate available information. Possible formats include narrative summaries, site maps, geologic cross sections, tabular data, flow diagrams, fence diagrams and cartoons. The narrative summary is the best means to describe the site, its history, nature of the sources, qualitative aspects of migration pathways, and the ecological and human receptors. Often times, historical information regarding disposal practices, waste composition, etc. obtained from active facilities is very useful when developing the CSM. Maps should be provided, and include relative positions of sources, plume contours, location of receptors, surface water features, wind direction, etc. Cross sections or fence diagrams showing subsurface contamination, ground water elevations, and geologic strata should be provided. Summary tables of representative, but not necessarily comprehensive, data to support the model can be provided. Flow diagrams, such as the Site Conceptual Exposure Model (SCEM) builder tool, can also be used for showing interrelationships of sources, pathways and receptors.

Many site investigation guidance documents provide information on the development of conceptual site models, such as the Superfund Soil Screening Guidance, which actually has worksheets for CSM development. See Appendix A for other titles and availability of additional guidance.

Project Administrative Procedures

The focus of Corrective Action is on results. Although we may try to incorporate results into the entire program there are some administrative procedures that must be followed to maintain consistency and organization. The following list of "How To" statements will walk the project coordinator through a number of tasks that she/he will likely encounter in daily project administration. They are provided here for quick reference and to ensure uniformity among all Corrective Action projects.

How to Request Technical Assistance from Central Office

Technical assistance is available from CO. Short term requests can be made by an informal phone call directly to a member of the engineering or remediation assistance unit. Long term requests should be made using the help request form on the DHWM Haznet. Clicking the "Submit Form" button at the web page will email the help request to the appropriate supervisor. The supervisor will then assign the request to an appropriate member of ERAS.

How to Request Technical Assistance from U.S. EPA

The U.S. EPA can supply technical assistance on a limited basis. Project coordinators who have requested technical assistance from CO may be able to request assistance from the U.S. EPA. This request must be directed towards the supervisors or manager of ERAS, so that the CO can provide oversight for the resource allocation. Because assistance from the U.S. EPA is available on a limited basis, each request must be weighed against all other requests for technical assistance from across the state. The requests with the highest priority will be forwarded to the U.S. EPA for technical assistance, when available. The DO may communicate directly with U.S. EPA during the period that it is providing technical assistance on a specific Corrective Action matter.

How to Incorporate Corrective Action into the State Permit

All hazardous waste permits will include a Corrective Action module (Module E) with terms and conditions as described in the model permit. Some of the permitted facilities in Ohio have current federal permits containing Corrective Action obligations. To facilitate the transition of these projects from federal to state lead there are several points that should be covered.

The first and most important activity when issuing a permit with Corrective Action is to contact the federal Corrective Action project manager. It is suggested that all project coordinators contact the federal Corrective Action project manager early in the process and arrange to be copied on all correspondence with the facility, if this does not already occur. Also, request copies of previously submitted reports (RFA, RFI) and the permit or order containing Corrective Action requirements if these are not readily available.

Prior to draft permit issuance, a date for Corrective Action transition from federal to state lead must be established. This date is established through discussions with the federal project manager, DO project coordinator and CO. Typically, the transition date should be established at a practical milestone in the process (for example, at RFI approval). However, the transition can be written to occur at most any time; for example, on the date of permit journalization. The only constraint is that for facilities where the federal permit has expired, the transition date must be the date of state permit issuance.

When writing the permit, model permit language should be used with the addition of site specific information as necessary. The beginning of the Corrective Action module will include a summary of the Corrective Action steps that have been taken at the site. This summary usually begins with the date the Preliminary Assessment/Visual Site Inspection (PA/VSI) was performed and concludes with current Corrective Action at the site. Other important information to include is the prior Corrective Action authority (federal or state permit or order), important milestones and dates, and general conclusions at each stage of the project. When Corrective Action is being transferred from federal to state lead, the summary also

must include the date of transition as agreed to with U.S. EPA. The future Corrective Action obligations of the facility can be identified in the summary. All interim measures, even those completed, also should be described. Only those measures currently required and not yet completed should be identified in the interim measures permit condition E.5. The information necessary for permit condition E.3 can be found in Section J of the Part B application, where the facility is required to identify and supply information on waste management units at the site. This should include the information required by OAC Rule 3745-50-44. Example Corrective Action summaries are available in the permits posted on DHWM's Web page.

Before the draft permit is issued, the Corrective Action summary should be forwarded to the appropriate U.S. EPA Region 5 permit writer for review and comment. If appropriate, a phone conference can be set up between CO, DO and the U.S. EPA permit writer to discuss the accuracy and content of the Corrective Action summary and to finalize any project transition matters.

By the time of draft permit issuance, the Ohio project coordinator should have a clear understanding of the Corrective Action project to date and have drafted the PMP for the Corrective Action. Recognizing that this is a time consuming, complex task, it cannot be stressed enough the importance of early coordination with the U.S. EPA and CO.

Boilerplate Letters for Review of Corrective Action Documents

The DHWM Haznet website includes boilerplate letters to be used to respond to submittals of Corrective Action documents. These letters, found at the Clean-up Boilerplate page of the website, include a work plan NOD, work plan approval, schedule extension approval and disapproval, report NOD, and report approval. The report letters can be used for RFI, CMS, or CMI Completion reports.

How to Process RFI, CMS, and CMI Work Plan and Report Approvals

The DO project coordinator will prepare the work plan or report approval letter for the DO manager's signature. The DO project coordinator should consult their supervisor for their DO's sign-off protocol to determine if the DO ES3 should be included in the review and sign-off of Corrective Action approvals.

Upon receipt of the signed letter at CO, the applicable event code listed below will be entered into RCRAInfo by the Regulatory and Information Services Section (RISS).

CA150 RFI Work Plan Approved
CA200 RFI Approved
CA300 CMS Work Plan Approved
CA350 CMS Approved
CA500 CMI Work Plan Approved

How to Process Remedy Decisions

Appendix C describes the administrative procedures for processing remedy decisions. These procedures are required even when a remedy is deemed unnecessary because facility conditions currently demonstrate that human health and the environment are being protected. Upon receipt of the relevant documentation (mod approval or Decision Document), RISS will enter the CA400 Remedy Decision event code into RCRAInfo.

Appendix C also describes how the CA400 Remedy Decision event code can be applied to sites where a facility-wide investigation is not necessary and closure and/or post-closure provided the remedy. Upon receipt of the summary document described in Appendix C, RISS will enter the CA400 Remedy Decision event code into RCRAInfo.

How to Process Environmental Indicator Determinations

Appendix C provides general information about environmental indicators (EIs) and describes when and how to make determinations on the Human Exposures EI and the Ground Water EI. These sections also outline the administrative procedures to process EI determinations. Upon receipt of the finalized EI determination, RISS will enter the applicable event code listed below into RCRAInfo.

CA725YE	Human Exposures Controlled Determination-Yes, applicable as of this date
CA725 IN	Human Exposures Controlled Determination-More information needed
CA725 NO	Human Exposures Controlled Determination-Facility does not meet definition
CA750YE	Release to GW Controlled Determination-Yes, applicable as of this date
CA750 IN	Release to GW Controlled Determination-More information needed
CA750 NO	Release to GW Controlled Determination-Facility does not meet definition

Procedures for Environmental Covenants

Environmental covenants placed on facility property are an acceptable corrective measure under the right circumstances. Although environmental covenants can be a standalone remedy, more often they are used with other measures including long term monitoring. Because of the nature of Ohio property law, it is important that Ohio EPA follow specific procedures to oversee implementation of environmental covenants. This section describes environmental covenants and presents the procedures Ohio EPA employed for overseeing them under the Corrective Action program.

What is an Environmental Covenant?

With the passage of House Bill 516 on December 22, 2004 Ohio's General Assembly created in Ohio Revised Code §5301.80 to §5301.92 Ohio's version of the Uniform Environmental Covenants Act. "Environmental covenant" means a servitude arising under an environmental response project that imposes activity and use limitations and that meets the requirements established in §5301.82 of the Revised Code. The law provides both Ohio EPA and the holder or owner of property the express legal authority to agree to subject that property or portion of that property to specified activity and use limitations, generally defined as restrictions or obligations, pursuant to a plan or work performed for environmental remediation of real property or for protection of ecological features associated with real property. The law defines this plan or work performed as an "environmental response project." Implementing the activity and use limitations is accomplished through the execution and proper filing of an environmental covenant with the county recorder.

The law specifies that a covenant must contain a legally sufficient description of the property subject to the covenant, a description of the activity and use limitations on the property, requirements for notice if the property is transferred, access rights for enforcement purposes, the name of every covenant holder and their signatures and the location of any administrative record for the environmental response project under which the covenant is created. The covenant will run with the land and is perpetual. It can only be amended or terminated by the signatories to the covenant and cannot be superseded by zoning laws. In response to an alleged violation, the covenant can be enforced through a judicial action by Ohio EPA, a person affected by the alleged violation of the covenant or a unit of local government in which the property subject to the covenant is located. What we previously called "use restrictions" that were properly filed in the county recorder's office before December 22, 2004 are not rendered invalid through passage of the law and remain in effect[1].

The law provides that environmental covenants can be applied in the context of a corrective action, a unit based closure or in post-closure, although their application in a post-closure scenario will be very limited. Creating an environmental covenant to limit a site to an industrial use, thus preventing residential exposures, is the most common example of how covenants are being used in our program. By limiting the exposure scenarios to activities deemed safe for the levels of contaminants present at the site, environmental covenants are appropriate for corrective actions/measures and closures utilizing nonresidential exposure scenarios. When created, implemented and overseen properly, an environmental covenant can serve as a viable means of mitigating or eliminating exposures to

[1] Prior to the date of this document, DHWM worked with the owners of sites to implement use restrictions both with and without the use of Director's Final Findings and Orders. In those use restrictions without Orders, the language creating the agreement existed only in the closure plan. It is the opinion of the legal office that the use restrictions implemented in this fashion are still legally sufficient. It is also the opinion of the legal office that use restrictions implemented through Orders are also still legally sufficient.

contaminants consistent with the future use of the site. Inclusion of an environmental covenant as an approved corrective action/measure can also help expedite finalization of the remediation of the site.

There continues to be some confusion over the difference between environmental covenants and deed notices. Ohio Administrative Code (OAC) rules 3745-55-19 and 3745-66-19 require, in part:

[w]ithin sixty days of certification of closure of the first hazardous waste disposal unit and within sixty days of certification of closure of the last hazardous waste disposal unit, the owner or operator shall: (1) Record, in accordance with state law, a notation on the deed to the facility property, or on some other instrument which is normally examined during title search, that will in perpetuity notify any potential purchaser of the property that:

(a) The land has been used to manage hazardous waste;

(b) Its use is restricted under rules 3745-55-10 [3745-66-10] to 3745-55-20 [3745-66-20] of the [OAC]…

Despite the language in (b), a deed notice does not act to restrict the use of property though the unit itself is subject to the post-closure rule requirements and the approved post-closure plan, which may contain certain restrictions on, for example, building on the cap. Rather, the deed notice required in OAC rules 3745-55-19 and 3745-66-19 works to provide notice to prospective purchasers and the public that the property was used to manage hazardous waste. The deed notice provided for in OAC rules 3745-55-19 and 3745-66-19 is required when a hazardous waste management unit enters post-closure care, i.e., closes as a landfill[2]. By contrast, when a unit is closed under an industrial exposure risk scenario with an environmental covenant, that unit has been closed and no post-closure care is required. If you are working on a closure unit that must enter post-closure care, then an environmental covenant is generally inapplicable. Rather, a deed notice under either OAC rules 3745-55-19 or 3745-66-19, depending on the status of the unit, must be implemented.

Ohio EPA's Office of Legal Services (Legal) developed an environmental covenant template that can be used in both the closure and Corrective Action context to impose activity and use limitations on individual hazardous waste management units or entire hazardous waste management facilities. The template includes all covenant provisions required by law. The law clearly sets forth what is necessary for the covenant to be filed, become effective and be monitored for compliance.

The environmental covenant template is available for reference purposes on Haznet at http://epaintra.epa.state.oh.us/dhwm/boilerplate3.html. Examples of finalized environmental covenants for reference purposes are found on the DHWM Web page at http://www.epa.ohio.gov/dhwm/userestrictions.aspx or by clicking on Final Actions/Environmental Covenants from the main page.

Environmental Covenant Scenarios

Ohio EPA may allow the facility owner/operator to meet DHWM risk goals by agreeing with the owner/operator to impose activity and use limitations on the entire property or where the waste management units (WMU) are located through the proper filing of an environmental covenant. If the owner/operator adequately controls future land use through implementation of and compliance with an environmental covenant (i.e., prohibits residential development or use, thereby limiting direct contact with the soils); an industrial exposure scenario may be used for quantifying exposures. There may be other

[2] OAC rules 3745-55-19 and 3745-66-19 do not apply in the facility-wide corrective action context.

scenarios in which environmental covenants need to be in place to ensure control of future land use. An example of this is a WMU that is not governed by OAC rule 3745-27-13.

In addition to requiring the facility owner/operator to control future land use, it may be appropriate to consider requiring the facility owner/operator to impose other activity limitations on the property or a portion of the property to ensure protection of human health and the environment. Or it may be appropriate, depending on site specific circumstances, to only require imposition of activity limitations. Activity limitations could include: ground water limitations (e.g., preventing exposure to contaminated ground water by prohibiting extraction or use of ground water, except for investigation or remediation thereof), disturbance limitations (e.g., to protect in place remedial systems, to prevent exposures caused by mixing of contaminated subsurface soils with "clean" surface soils, and to prevent contact with subsurface contamination during excavation), and construction limitations (e.g., to prevent exposure to volatile emissions to indoor air from soil or ground water.)

Industrial Exposure Scenario

The industrial exposure scenario assumes industrial use of the WMU(s)/facility, where exposures are based on adult workers. Receptors that may be present in this scenario include the following subpopulations: occupational receptors, trespassers, and construction/utility workers. At a minimum, the following routes of exposure should be evaluated: ingestion of soil, inhalation of volatiles and particulates from soil, and dermal contact with soil. It may also be necessary to evaluate inhalation of indoor air from vapor intrusion of volatile constituents of concern into an enclosed structure.

The District Office (DO) project coordinator, in conjunction with his/her supervisor (Central Office [CO] assistance can be requested as necessary) is the lead person who works with the owner/operator to determine if an industrial exposure scenario and an environmental covenant is an appropriate corrective measure. The DO project coordinator must determine when it is appropriate, both technically and practically, to allow the use of an industrial exposure scenario (i.e., site specific technical issues as well as current and future land use considerations).

Technical and Practical Issues

As indicated above, soil standards based on the industrial exposure scenario are calculated with different exposure parameters than those used for the residential use exposure scenario. Also, the child receptor is not considered for the industrial exposure scenario. Therefore, it is imperative to evaluate whether or not the reduced exposure to soils in the industrial exposure scenario is appropriate for the Corrective Action project.

Please note that soil standards are calculated assuming reduced exposure. For ground water standards, the owner/operator should consult the *Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action* (U.S. EPA, Solid Waste and Emergency Response, April, 2004) for guidance. Regardless of the basis for the ground water standard calculations, facilities need to demonstrate that industrial soil standards cannot leach quantities of contaminants in excess of the agreed upon ground water cleanup standards.

Many factors should be evaluated to determine the appropriateness of an industrial exposure scenario. Listed below are some of the factors to be considered in determining whether or not an industrial exposure scenario is appropriate (the list is from U.S. EPA's (1995) *Land Use in the CERCLA Remedy Selection Process*):

Technical Issues:

(1) Ground water considerations (e.g., depth to ground water, potential to contaminate drinking water supplies, and potential use as a water supply);

(2) The properties of the constituents of concern (COC) (e.g., organics vs. inorganics, and volatiles vs. semi-volatiles), their concentration, and toxicity;

(3) COC environmental fate (e.g., contaminant mobility, biodegradability, toxicity of breakdown products, and persistence);

(4) Hydraulic conductivity (i.e., permeability, and soil porosity) of the soil;

(5) Partitioning ability and leachability of the COC (e.g., partitioning/distribution coefficient, and leaching test results from the area of highest concentration to be left in place); and

(6) Whether or not waste will be left in place.

Practical Issues:

(7) Site security (e.g., limited access, and fencing);

(8) Adjacent land use considerations for both current and future use (e.g., industrial, commercial, residential; and city zoning designations);

(9) Length of time for which the facility has been operating at the site and will likely continue to operate at the site;

(10) Any other remediation projects at the site; and

(11) Community acceptance of a land use choice.

In order to better evaluate the suitability of a site for this scenario, the use of the technical and practical factors listed above should be viewed together. In other words, the answer to one or two of the issues listed is not enough to make a determination, but instead it is an evaluation of all of the information together. Site specific conditions will dictate which approach is selected as some factors may be more critical at one site versus another. As a result of differing site specific details, sites with similar contaminants of concern might not necessarily be addressed in the same fashion.

Once the DO project coordinator, in conjunction with his/her supervisor or manager, makes the decision that it is appropriate for a facility to use an industrial exposure scenario and propose an environmental covenant as a corrective measure, the following procedures should be used to work with the facility to create the environmental covenant. As there is more than one mechanism (orders, permits, possibly no mechanism at all if the facility performed the necessary work voluntarily) used to require facility-wide investigations and corrective measures that could include the utilization of an environmental covenant, a separate but similar administrative procedure was developed for use with each mechanism.

Consensual Director's Final Findings and Orders ("administrative orders") Requiring Investigation/Corrective Measure Implementation

For the few administrative orders DHWM has negotiated with facilities, the general approach is to negotiate and issue two separate administrative orders (unless the facility agrees to one order, which has not yet happened). In general, the first set of administrative orders requires the facility to conduct a facility-wide investigation, complete an approvable report documenting the results of the investigation and complete an approvable corrective measures study report in which the facility proposes the corrective measures it will implement. The second set of administrative orders requires the facility to implement the corrective measures selected by Ohio EPA and to produce a final report documenting successful implementation of the measures. Under this scenario, the second set of administrative orders requiring implementation of the selected corrective measures can also serve as a vehicle to direct the facility to submit to Ohio EPA for the Director's signature an environmental covenant signed by the facility, using the environmental covenant template provided by Ohio EPA. Once the environmental covenant is signed by the Director, the terms of the environmental covenant will determine when and how it should be properly filed and distributed.

Facility representatives are encouraged to discuss the feasibility of choosing the industrial exposure scenario option and/or imposing activity limitations with the DO project coordinator and to clearly make known to the DO project coordinator (or the project management team, as appropriate, if one was formed) this choice as early in the Corrective Action "process" as possible. (The DO project coordinator can provide a copy of the environmental covenant template to the facility representative at any time). Once the DO project coordinator, in conjunction with his/her supervisor/manager, determines it is technically and practically appropriate for an industrial exposure scenario to be used, and/or for activity limitations to be imposed, the DO project coordinator should ask his/her supervisor to contact the manager of CO ERAS and ask that a member of CO ERAS staff be assigned. For the purposes of drafting the environmental covenant, the assigned CO ERAS staff will serve as the primary point of contact between the DO project coordinator, the facility representative, and Legal (if needed).

The DO project coordinator then needs to set up a call or meeting with the facility representative and the assigned CO ERAS staff to discuss how the environmental covenant will be developed and finalized. At this call or meeting, the obligations associated with the option to use an industrial exposure scenario and/or to impose activity limitations will be communicated to the facility representative. In order to successfully utilize an industrial exposure scenario or to agree to activity limitations through the execution of an environmental covenant, the facility owner/operator is obliged to clearly state in the appropriate document (likely the RFI Report [if a presumptive remedy is contemplated] or the CMS Report) his/her commitment to execute and file an environmental covenant using the covenant template developed by Legal. The commitment language should generally read as follows:

> "[Company X] understands that when an environmental covenant is required as a corrective measure it must be implemented through proper execution and filing of an environmental covenant using the template developed by Ohio EPA. The enforceability of the covenant is dependent upon the proper recording of the environmental covenant in the appropriate County Recorder's Office. [Company X] agrees that the environmental covenant must be finalized and recorded prior to [Company X's] submission to Ohio EPA documenting that the selected corrective measures were implemented successfully."

The DO project coordinator is responsible for reviewing the document in which the proposal to execute and file an environmental covenant is contained. In whatever Corrective Action document the facility proposes to implement an environmental covenant, the document must clearly specify the activity and/or use limitation that is being contemplated. If a piece of property is proposed to be limited to a certain use or certain activities are to be limited, the document should contain a detailed description of the piece of property and activity limitation. The detailed description would not have to contain the exact level of detail

needed for execution of the covenant (it would be very desirable if in fact it was described that way) but it should provide a clear representation of what piece of property is subject to the activity or use limitation.

If the facility verbally commits to creating and implementing an environmental covenant but does not include the commitment language and information on the actual piece of property whose use is to be restricted in the relative Corrective Action document, the DO project coordinator should use a Notice of Deficiency/comment letter to prompt the facility to include the information in a revised submittal. If a comment letter/NOD is planned because of other deficiencies in the document, the environmental covenant related comments should be incorporated into it. If the facility chooses not to provide a revised document with the appropriate commitment, the report should not be approved and the facility should be informed that another corrective measure, one that meets the residential standards scenario, must be proposed. **The DO project coordinator should always know where exactly in the report or other Corrective Action document the commitment to execute and file an environmental covenant is contained.**

The DO project coordinator will include in Ohio EPA's Statement of Basis the environmental covenant as a corrective measure including the detailed use and/or activity limitations associated with it.

In conjunction with the assigned CO ERAS staff, the DO project coordinator will provide the appropriate facility background information and a description of the environmental response project to be included in the environmental covenant. However, the assigned CO ERAS staff and the facility representative/attorney have the responsibility of finalizing the environmental covenant. At a minimum, the environmental covenant must be filed prior to Ohio EPA's approval of the Corrective Measures Implementation report.

Summary of Responsibilities for Facilities With Administrative Orders (Note: except for the responsibilities of the facility owner/operator, the tasks identified in the columns and rows in the following table will not always be accomplished in the order in which they appear):			
DO project coordinator	DO management	CO ERAS staff	Facility Owner/Operator
Provides facility with the environmental covenant template.	Contacts the manager of CO ERAS to request that a member of ERAS be assigned.	Serves as point of contact for both the facility and Legal (if needed). Provides facility with the environmental covenant template if not already done.	Includes language in the appropriate Corrective Action document reflecting facility's commitment to execute and file an environmental covenant.
Determines the appropriateness of the industrial exposure scenario or activity limitation.		Completes the environmental covenant checklist available on Haznet.	Provides an exact legal description of the property to be restricted.
Sets up meetings as needed to reach agreement with facility on details of activity and/or use limitations.		Finalizes facility specific environmental covenant and forwards it to DHWM's chief and Legal for final approval.	Provides to Ohio EPA for the Director's signature the environmental covenant signed by the facility owner/operator.

Reviews of the submitted document in which the proposal to execute and file an environmental covenant is contained.			Files the signed environmental covenant with the appropriate County Recorder.
Drafts NOD or approval, whichever is appropriate.			Provides Ohio EPA with evidence that the environmental covenant was filed.
Assists CO ERAS staff in providing facility background information and describing the environmental response project for the environmental covenant.			Complies with the covenant.

Permit Modifications

In the permit context, corrective measures will be imposed in most cases through either a director initiated permit modification or a Class 3 permit modification requested by the facility.

Facility representatives are encouraged to discuss the feasibility of choosing the industrial exposure scenario option and/or any use or activity limitation with the DO project coordinator and to clearly make known to the DO project coordinator (or the project management team, as appropriate, if one was formed) this choice as early in the Corrective Action "process" as possible. Once the DO project coordinator, in conjunction with his/her supervisor/manager, determines it is technically and practically appropriate for an industrial exposure scenario to be used and/or for activity limitations to be imposed, the DO project coordinator should contact the CO ERAS permit contact. For the purposes of drafting the environmental covenant, the CO ERAS contact will serve as the primary point of contact between the DO project coordinator, the facility representative, and Legal (if needed).

The DO project coordinator then needs to set up a call or meeting with the facility representative and the CO ERAS contact to discuss how to develop and execute an environmental covenant in the permit modification context. At this call or meeting, the obligations associated with activity limitations and/or the option to use an industrial exposure scenario will be communicated to the facility representative. In order to successfully utilize an industrial exposure scenario risk assessment or to limit certain activities, the facility owner/operator is obliged to clearly state in the appropriate document (likely the RFI report, if a presumptive remedy is contemplated, or the CMS report) his/her commitment to file an environmental covenant using the template developed by Legal; the commitment language should generally read as follows:

> "[Company X] understands when an environmental covenant is required as a corrective measure, it must be implemented through proper execution and filing of an environmental covenant using the template developed by Ohio EPA. The enforceability of the covenant is dependent upon the proper recording of the environmental covenant in the appropriate County Recorder's Office. [Company X] agrees that the environmental covenant must be finalized and recorded prior to [Company X's] submission to Ohio EPA documenting that the selected corrective measures were implemented successfully."

The DO project coordinator is responsible for reviewing the document in which the proposal to execute an environmental covenant for the facility or a portion of the facility is contained. In whatever Corrective Action document the facility proposes to implement an environmental covenant, the document must clearly specify what type of activity or use limitation is being contemplated. If the use of a piece of property is proposed for restriction, the document should contain a detailed description of the piece of property. The detailed description would not have to contain the exact level of detail needed for execution of the environmental covenant (it would be very desirable if in fact it was described that way) but it should provide a clear representation of what piece of property is to be restricted.

If the facility verbally commits to creating and implementing an environmental covenant but does not include the commitment language and information on the actual piece of property to be restricted in the relative Corrective Action document, the DO project coordinator should use a Notice of Deficiency/comment letter to prompt the facility to include the information in a revised submittal. If a comment letter/NOD is planned because of other deficiencies in the document, the environmental covenant related comments should be incorporated into it. If the facility chooses not to provide a revised document with the appropriate commitment, the report should not be approved and the facility should be informed that another corrective measure, one that meets the residential standards scenario, must be proposed. **The DO project coordinator should always know where exactly in the report or other Corrective Action document the commitment to execute an environmental covenant is contained.**

Whether Ohio EPA initiates the modification (which will be the likely scenario) or the permittee requests it, issuance of a draft permit by Ohio EPA, accompanied by a Statement of Basis, is the first step in the modification process. The Statement of Basis must describe the piece of property where use will be restricted and/or activities limited and the process by which an environmental covenant will be created and implemented. The draft permit itself must include a term and condition that speaks directly to the environmental covenant. The following example language is suggested for the term and condition:

> "The human health risk assessment assumed industrial land use for the WMUs. Institutional controls are required to ensure that site-wide land use remains industrial until such time when risk values for unrestricted land use are achieved. Under this permit, the institutional controls will consist of measures that limit the future use of the property in a manner that is consistent with the risk values for the site. This will be accomplished through one or more environmental covenants. An environmental covenant, as set forth in Ohio Revised Code (ORC) §5301.80 through §5301.92, is a written agreement between Ohio EPA and the property owner arising under an environmental response project that imposes activity and/or use limitations on specific portions of a site. The environmental covenant(s) must be filed with the County Recorder in accordance with state law governing recording and priority of interest in real property. The environmental covenant(s) will run with the land and be binding upon a future property owner should the property be sold. Monitoring the property owner's adherence to the environmental covenant(s) will help to ensure continued protection of human health and the environment. A violation of the environmental covenant is enforceable by Ohio EPA. The environmental covenant(s) cannot be amended or terminated without the consent of Ohio EPA.
>
> The Permittee must supply Ohio EPA with a legal description of each parcel to be restricted by an environmental covenant and a list of encumbrances on each parcel. In order to complete the environmental covenant(s), the Permittee must be prepared to enter into good faith negotiations with Ohio EPA at least ninety (90) days prior to the projected filing date for the covenant(s).
>
> The Permittee must finalize and record the environmental covenant(s) prior to submitting the Corrective Measures Completion Report required by Condition XX. A file and date stamped copy of the environmental covenant(s) must be included in the Corrective Measures Completion Report."

If the permittee or any other party comments on the draft permit specific to the environmental covenant, the DO project coordinator should work with the CO ERAS contact to respond to the comment(s).

If work has not already begun on creating the environmental covenant by the time the modified permit is issued in final form, the facility should be prompted by the CO ERAS contact to begin that work immediately. The DO project coordinator will assist the CO ERAS contact by providing the appropriate facility background information, the agreed upon detailed activity and/or use limitations and a description of the environmental response project to be included in the environmental covenant. At a minimum, the environmental covenant must be finalized by the end of the time frame specified in the permit term and condition contained in the final modified permit, unless that term and condition is changed through a subsequent permit modification request initiated by the permittee. In all cases, the environmental covenant must be filed prior to Ohio EPA's approval of the Corrective Measures Implementation report.

Summary of Responsibilities for Permitted Facilities (Note: except for the responsibilities of the facility owner/operator, the tasks identified in the columns and rows in the following table will not always be accomplished in the order in which they appear):		
DO project coordinator	CO ERAS contact	Facility Owner/Operator
Determines the appropriateness of the industrial exposure scenario and/or any activity or use limitations.	Serves as point of contact for both the facility and Legal (if needed). Provides facility with the environmental covenant template.	Includes language in the appropriate Corrective Action document reflecting his/her commitment to create and implement an environmental covenant.
Sets up meetings as needed to reach agreement with facility on details of activity and/or use limitations.	Completes the environmental covenant checklist available on Haznet.	Provides an exact legal description of the property to be restricted.
Reviews of the submitted document in which the proposal to execute and file an environmental covenant is contained.	Finalizes facility specific environmental covenant and forwards it to DHWM's chief and Legal for final approval.	Provides to Ohio EPA for the Director's signature the environmental covenant signed by the facility owner/operator.
Drafts NOD or approval, whichever is appropriate.		Files the signed environmental covenant with the appropriate County Recorder.
Prepares permit modification documents, including Statement of Basis.		Provides Ohio EPA with evidence that the environmental covenant was filed.
Assists CO ERAS in providing facility background information and describing the environmental response project.		Complies with the environmental covenant.

Other Facilities that Need to Create and Implement an Environmental Covenant

There are a handful of other facilities that will be creating and implementing an environmental covenant as a corrective measure that do not have a permit and are not performing Corrective Action work pursuant to consensual administrative orders.

Examples of other mechanisms (or lack thereof, if the facility is doing the work voluntarily) prompting facilities to conduct Corrective Action activities where an environmental covenant needs to be created and implemented are as follows: 1) state judicial consent decrees, 2) voluntary agreements facilities entered into with U.S. EPA where Ohio EPA agreed to finalize the environmental covenant selected by U.S. EPA as a corrective measure, and 3) administrative consent orders facilities entered into with U.S. EPA where Ohio EPA, as a pilot project under RCRA Corrective Action Reforms II, agreed to work with U.S. EPA to require the facility to create and implement an environmental covenant, as prescribed by Ohio EPA, under Ohio law.

For these facilities, the assigned member of CO ERAS staff acts as the primary point of contact with the facility. The CO ERAS staff member must work with the facility to reach agreement on the appropriateness of the environmental covenant along with the specific activity and/or use limitations. Once that agreement is reached, the CO ERAS staff and the facility representative/attorney have the responsibility to create and finalize the environmental covenant. The CO ERAS staff also ensures the facility commits to executing a covenant in whatever plan or report the parties agree must be submitted for approval. That document then provides a basis for moving forward with and public noticing a Statement of Basis that proposes selection of the environmental covenant as a corrective measure.

Summary of Responsibilities for Facilities Without Administrative Orders or a Permit (Note: except for the responsibilities of the facility owner/operator, the tasks identified in the columns and rows in the following table will not always be accomplished in the order in which they appear):	
CO ERAS staff	Facility Owner/Operator
Serves as point of contact for both the facility and Legal (if needed). Provides facility with the environmental covenant template.	Provides an exact legal description of the property to be restricted.
Sets up meetings/calls as needed; reaches agreement with facility on detailed use and/or activity limitations.	Provides to Ohio EPA for the Director's signature the environmental covenant signed by the facility owner/operator.
Completes the environmental covenant checklist available on Haznet.	Files the signed environmental covenant with the appropriate County Recorder.
Finalizes facility specific environmental covenant and forwards it to DHWM's chief and Legal for final approval.	Provides Ohio EPA with evidence that the environmental covenant was filed and complies with the environmental covenant.

Frequently Asked Questions

This section presents typical answers to common questions that arise under the Corrective Action program. The information should be considered general guidance for staff to use in evaluating issues encountered in the course of Corrective Action, rather than hard and fast requirements. The appropriate path forward for any given facility will depend upon its specific circumstances.

How will we address a unit that is subject to both closure and Corrective Action?

Units for which there are approved closure and/or post-closure plans in place should be closed under those plans, whenever possible. However, in limited circumstances it is possible to integrate closure of a unit into an enforceable document such as a permit or order that requires Corrective Action. This is done because the physical work is often very similar, and at many sites contamination may prove ubiquitous. This is a site specific determination that should be coordinated through Central Office.

When can a spill area become a Waste Management Unit (WMU)?

According to the 1990 proposed Subpart S preamble, the definition of a solid waste management unit (WMU in Ohio) is "any discernible unit at which solid wastes have been placed any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released" (55 FR 30798). The key to determining if a spill area meets this definition is the "routinely and systematically released" phrase. Examples of routine and systematic releases may include wood preservative kickback drip areas, loading docks, and outdoor solvent washing areas. Examples of releases that are not routine or systematic include onetime spills and passive leakage from a product storage tank which have not been properly cleaned up. These are not WMUs because they were not caused by routine and systematic human activities. Although this definition excludes potential contamination from falling subject to Corrective Action, problematic spill areas can be addressed under the State's permitting omnibus authority or in Corrective Action orders. Rather than debating on whether or not an area meets the WMU definition, discussions should focus on whether or not a release has occurred that requires a response. The 1996 ANPR supports the opinions expressed in the 1990 proposal (61 FR 19443).

How do you know what parameters to use for sampling at a given WMU?

Facilities are responsible for releases of "hazardous waste or constituents" from WMUs. In the 1990 proposed Subpart S rules, U.S. EPA interprets the term "hazardous waste" to carry the statutory, not regulatory definition (55 FR 30809). Of specific concern are the hazardous constituents listed in either Appendix VIII of 40 CFR Part 261 or Appendix IX to 40 CFR Part 264. Potentially then, all wastes meeting the statutory definition or containing the Appendix VIII or IX constituents could be sampled for. However, this may often be unnecessary given the historical knowledge of waste composition at RCRA facilities. Similar to closure, the constituent list should be composed of the hazardous waste (including constituents and degradation products) that have likely been managed at the unit, based on available information. When a very wide variety of wastes have been managed in a unit, or when very little information is available, facilities should sample for a broader set of constituents. Ohio EPA recognizes that laboratory analysis can be extremely difficult or impossible for some Appendix VIII constituents. A facility undertaking Corrective Action must make reasonable efforts to address all Appendix VIII constituents, but Ohio EPA must also exercise sound judgment in assessing the state of analytical capability.

What justifies use of a phased approach during the RFI?

In phasing, the information gained in early stages of a project is used to refine and focus data collection in subsequent phases. Phasing data collection during the RFI allows the project manager to efficiently

segregate areas that don't require further study from those that do. This conserves time and resources, and allows integration of data collection necessary for problem definition and remedy selection or interim measures, if needed. The prioritization of problems at the facility will aid in the use of a phased approach for Corrective Action.

What justifies grouping of WMUs for sampling?

WMUs may be grouped where they are in close proximity, managed similar wastes, release mechanisms from the units are similar, and there is ubiquitous contamination that does not provide a clear distinction between units. Areas where "hot spot" contamination within the grouping is evident may require separate sampling and risk assessment.

Is Ohio EPA, DHWM, recommending or stipulating the use of the new Method 5035 (with use of the EnCore sampler) for analysis of VOC's in soil during RFI's?

The December 22, 1997 U.S. EPA directive "Determination of Volatiles in Soils Directive for Change" requires that all Corrective Action projects must use the new methods for volatiles in soil. Ohio EPA agrees and now requires use of the method for closure and Corrective Action where the data will be used in risk assessments or for confirmation sampling. However, this does not preclude use of other methods or field screening techniques when they fall within data quality objectives established for specific phases of the project.

Who makes the decision about when an Interim Measure is required?

The decision of when to require an interim measure should be a joint one between the facility and the project coordinator. Generally, interim measures should be required anytime there is a current or imminent threat to human health or the environment. The prioritization of problems at the facility will help in identifying those items that may require interim measure implementation. When a facility is reluctant to perform an interim measure, the Agency may issue orders (or modify the permit) to do so.

What do you do if the reporting limit exceeds the human health or ecological standard for a chemical?

According to the Risk Assessment Guidance for Superfund, all reporting limits must be below the applicable standard for that constituent. If they are not, nondetect samples may actually be present at concentrations above the standard. To prevent this, careful review of all detection limits specified in the QAPP must occur, with particular attention to comparison of detection limits with applicable screening values or standards (e.g., MCLs). Where this cannot be avoided, the reporting limit can be used in the risk assessment.

Who will approve the choice of the remedial technology to be used at a site?

The facility will propose the remedy it would like to implement. It may consider several alternatives as part of a CMS, or may propose a single presumptive remedy. The project coordinator must ensure that any remedy fulfills the threshold and balancing criteria established in the Ohio CAP, and meets the other remedial expectations established in this handbook. Actual selection of the final remedy is done by the Agency through a permit modification (or order issuance).

Will Ohio allow for industrial scenarios in Corrective Action? If so, will an environmental covenant be required?

Future industrial land use is very likely for many RCRA sites, as the majority of the regulated facilities subject to Corrective Action are active industrial sites. In order to proceed under a future industrial land

use scenario, it is necessary for the facility to demonstrate to the Agency a bona fide future industrial land use. This can be done through methods outlined in the U.S. EPA guidance "Future Land Use in the Remedy Selection Process" referenced in this handbook. The Agency can then weigh this evidence (including the support of the community for such a designation) when determining if the industrial scenario is applicable. All Corrective Actions which use the future industrial land use scenario will need to include an environmental covenant to support this component of the selected remedy. Please refer to the Procedures for Environmental Covenants section of this Handbook for information about implementing environmental covenants.

Who will be reviewing the lab QAPPs?

Project coordinators, or other members of the technical review team, are expected to review QAPPs submitted as part of Corrective Action. Region 5 has prepared guidance in this area, as well as a model QAPP that can be followed. See the guidance listed in Appendix A for more information on reviewing QAPPs.

Will Ohio require financial assurance for Corrective Action?

OAC Rule 3745-54-101 requires financial assurance for Corrective Action. Generally, financial assurance will be required for remedy implementation and operation and maintenance activities. Financial assurance will be required in the permit or order at the time of remedy selection.

What procedures will be used for dispute resolution?

Ideally, by incorporating project management principles into the way we manage Corrective Action projects, many disputes can be avoided or quickly resolved between draft and final permit issuance. When this is not the case, final actions of the Director are appealable to the Environmental Review and Appeals Commission (ERAC).

How many samples are enough? How deep should sampling be performed?

Questions on sampling are site (and WMU) specific and cannot be answered here. There is a multitude of sampling guidance available; see Appendix A of the handbook for more information.

How will Ohio approach field screening technologies for sampling?

Consistent with the U.S. EPA directive, "The Use of Field Methods to Streamline Corrective Action", field screening technologies are encouraged to reduce cost and time in site investigations. Rapid data collection results in faster project progress and allows sampling locations to be determined in the field, which may result in more accurate site characterization. However, field screening methods must only be used when they fit into the data quality objectives established for the project.

Will Ohio require ecological risk assessments during Corrective Action?

As stated in the Ohio CAP, at a minimum, a screening level ecological risk assessment must be performed for every Corrective Action project.

What position will Ohio take on the use of historical (nonRFI) data?

The use of historical data is encouraged, as it reduces the cost and time associated with site investigation. The data must be non time dependent, and of usable quality and format. The historical data must fit within the data quality objectives established for the project.

A risk assessment is performed by a facility during the RCRA facility investigation. The results of the risk assessment indicate no unacceptable risks for the site based on an industrial use scenario. Based on this, the facility recommends no remedial actions during the CMS/CMI. Citing the Advanced Notice of Proposed Rulemaking (ANPR), the facility further proposes to reevaluate the risks in the future if land use or potential exposure scenarios change. A revised risk assessment would be conducted in the future to reflect exposure assumptions consistent with the land use and corrective measures would be implemented at that time, if necessary. Assuming this approach is acceptable to the Agency, should an environmental covenant be a component of the remedy since an industrial scenario is proposed?

Any time an industrial future land use is relied upon, it must be established within an environmental covenant. If in the future a facility wishes to complete cleanup to unrestricted land use, they may do so, and the restriction on the land use could be removed with Ohio EPA approval.

Does Corrective Action use screening levels? How do they account for multiple constituents?

Screening levels, or Action Levels as they are sometimes known, are defined as constituent concentrations in media that trigger some specific action, but not necessarily remediation. A conservative concentration is established as an action level, below which no further action is warranted. Above the action level, some action is required, such as further study or a site specific risk assessment, but not necessarily remediation. Action levels may be developed on a site specific basis, or taken from generic lists. In either case, the action levels used must be reviewed to ensure they are sufficiently conservative, use up to date toxicity information, and use accurate exposure scenarios. Action levels are not cleanup levels. Cleanup levels are determined on a site specific basis considering many factors such as: risk, technical practicability, benefit/cost analysis, and the other components of the broader “media cleanup standards” (i.e., point of compliance, remediation time frame, and media cleanup levels).

Glossary of Corrective Action Terms

Aquifer

A geologic formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to wells or springs.

Aquifer, confined: An aquifer bounded above and below by impermeable beds or by beds of distinctly lower permeability than that of the aquifer containing confined ground water.

Aquifer, unconfined: An aquifer in which there are no confining beds between the zone of saturation and the ground surface. There will be a water table in an unconfined aquifer.

Area of Concern (AOC)

An area that has received, at any time, solid or hazardous waste through deliberate placement of the waste or because of an accidental release or spill.

Background Screening Level

The concentration of constituents that are naturally occurring in the environment that would exist even in the absence of the industrial site under consideration. These concentrations do not necessarily represent cleanup concentrations.

Background Soil Investigation

An investigation to establish soil metal background levels for an area. A background area is an area which has been unaffected by human activity.

Bedrock

A term for the consolidated rock that underlies the unconsolidated soils and glacial debris.

Benchmark

The screening risk values established to determine if further action(s) are needed at a WMU/AOC.

Biodegradation

The natural breakdown of chemical constituents through biological processes of naturally occurring organisms.

Borehole

A hole drilled into the earth, usually for exploratory purposes. Casings and screens may be added to create a monitoring well.

Boring (or Soil Boring)

A circular hole made in the ground by an auger or mechanical drill rig to collect soil samples deep in the ground. Representative samples are collected for testing to see if the subsoil has been contaminated. Sometimes these borings are converted into ground water monitoring wells.

Boring Logs

The record of geologic formations penetrated, drilling progress, depth of water, location of contaminants, and other information having to do with the drilling of a well.

Carcinogen

Any substance or agent that produces cancer in humans or animals.

Carcinogenic Risk

The estimated upperbound probability of an individual developing cancer as a result of exposure to potential carcinogenic contaminants in the environment.

Clean Water Act (CWA)

The Clean Water Act (CWA) is the cornerstone of surface water quality protection in the United States. (The Act does not deal directly with ground water or with water quantity issues.) The law employs a variety of regulatory and non regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff.

Cleanup Process

A comprehensive program for the clean up (or remediation) of a polluted site. It involves investigation, analysis, and development of a cleanup plan and implementation of that plan.

Constituents of Concern

Any contaminant discovered during a facility investigation at a level that has the potential to negatively impact human health or the environment.

Contamination

The introduction into air, soil or water of any chemical material, organic material, live organism, or radioactive material that will adversely affect the quality of the medium.

Corrective Action

Gives RCRA authority to require responsible parties to address the investigation and cleanup of hazardous releases. RCRA Corrective Action, as required by the 1984 Hazardous and Solid Waste Amendments, includes a site wide investigation and potential remediation as necessary to protect human health and the environment. However, ground water corrective action, as defined in OAC Rule 3745-54-100, is part of the ground water monitoring requirements where a facility must clean up the ground water to the ground water protection standard. DHWM generally uses **C**orrective **A**ction for the first definition while Corrective Action is used for the latter.

Corrective Measures Implementation (CMI)

Part of the RCRA process. The CMI phase involves the design and implementation of a chosen remedy.

Corrective Measures Study (CMS)

Identification and evaluation of potential remedial alternatives for the releases that have been identified at a facility.

Decision Document

A document issued by the Ohio EPA that identifies the director's selected remedy or remedies for a contaminated site and the reasons for its selection.

Detection Limit

The lowest concentration of a chemical that can be reliably reported to be different from zero concentration.

Description of Current Conditions (DOCC)

A document required by the Ohio EPA before a site investigation begins that includes what is known about the background and existing state of the site.

Downgradient
In the direction of decreasing hydrostatic head.

Drawdown
The drop in the water table or level of water in the ground when water is being pumped from a well.

Ecological Receptor
Non human animals or plant life potentially exposed to contaminants released at a site.

Ecological Risk Assessment
Evaluation of actual and predicted effects of contaminants on animal and plant populations and their habitats or communities. An ecological risk assessment does not evaluate the impact of contaminants on humans and domestic animals.

Environmental Covenant
A legally enforceable document that imposes activity and use limitations. The land use restriction runs with the land and is binding upon existing and any future property owner, should the property be sold.

Environmental Receptors
Any organism, including site employees, building occupants, the public at large, the atmosphere, animals, plants and microorganisms that may be affected by a release of a contaminant or pollutant.

Excess Lifetime Cancer Risk
An estimate of the potential increased risk of cancer that results from lifetime exposure, at specified average daily doses, to constituents detected in the media at the site.

Exposure
Contact of an organism with a chemical or physical agent.

Exposure Assessment
The determination or estimation of the magnitude, frequency, duration, and route of exposure.

Exposure Pathway
The course of a chemical or physical agent from a source to an exposed organism. Each exposure pathway includes a release from a source, an exposure point, and an exposure route.

Facility
A facility is defined by the boundaries of an area in which one or more sources of pollution may be located.

Filtered Ground Water Sample
The ground water sample is pumped through a filter to remove suspended solids.

Final Remedy
The remedy that was chosen after the entire RCRA Corrective Action evaluation has been completed for an area. It includes the investigation and public comment/involvement.

Fracture
A break in a rock formation due to structural stresses. Faults, shears, joints, and planes of fracture cleavage are all types of fractures.

Generic Numeral Standards

Concentrations in soil or water which are considered safe for a substance based on the substance's mobility and toxicity.

Generic Risk-based Cleanup Numbers

Concentrations in soil or water which are considered safe for a substance based on the substance's mobility and toxicity.

Geology

The study of soil layers, rocks, rock formations and the structure of the earth.

Geophysical Study

Methods of investigating the formations below the surface that involve the analysis of electrical measurements on the land surface or the analysis of subsurface vibrations that are created by an energy source on the land surface.

Geoprobe®

A direct push machine used to make soil borings and to create temporary ground water monitoring wells and collect soil samples.

Ground Water

Water below the land surface in a zone of saturation.

Ground Water, Confined: The water contained in a confined aquifer. Porewater pressure is greater than atmospheric at the top of a confined aquifer.

Ground Water, Perched: The water in an isolated saturated zone located within the vadose zone. It is the result of the presence of a layer of material of low hydraulic conductivity. Perched ground water will have a perched water table.

Ground Water Discharge

The removal of water from the saturated zone is called ground water discharge. The discharge area is the geographic area in which the removal occurs.

Ground Water Flow

The movement of water through openings in sediment and rock that occurs in the zone of saturation.

Ground Water Recharge

Land surfaces where water enters the ground and replenishes ground water. This process occurs naturally when precipitation infiltrates down through the soil or rock into an aquifer. It also can occur unnaturally as artificial recharge.

Hazard Index

The sum of hazard quotients (non-cancer) for all exposure routes which are relevant to the constituent. This indicates if the estimated exposure dose for that constituent exceeds acceptable levels for protection against non-cancer effects.

Hazardous Waste

Byproducts of society that can pose substantial or potential harm to human health or the environment when improperly managed. Possesses at least one of four characteristics: flammable, corrosive, reactive, or toxic; or appears on special EPA lists.

Hazardous Waste Permit Modification
A modification of a facility's Hazardous Waste Installation and Operation Permit.

Hollow Stem Auger Drilling
Conventional drilling method that uses a rotary drill with a screw device (auger) to penetrate the soil. As the augers are rotated, soil cuttings are conveyed to the surface by auger spirals.

Hot Spot
Area where there is a high concentration of a contaminant in soil or sediment.

Human Receptor
A person that has the potential to be exposed to contaminants released at a site.

Hydraulic Conductivity
The ability of an aquifer to transmit water. Aquifers with high hydraulic conductivity yield and transmit more water than similar aquifers with low hydraulic conductivity.

Hydraulic Gradient
In general, the direction of ground water flow due to changes in the depth of the water table.

Hydrogeology
The geology of ground water, with particular emphasis on the chemistry and movement of water.

Impermeable
Not easily penetrated. The property of a material or soil that does not allow, or allows only with great difficulty, the movement or passage of water.

Incineration
A treatment technology involving destruction of waste by controlled burning at high temperatures; e.g. burning sludge to remove the water and reduce the remaining residues to a safe, nonburnable ash that can be disposed of safely.

Industrial Waste
Unwanted materials from a manufacturing or similar operation; may be liquid, sludge, solid or hazardous waste.

Infiltration
The penetration of water through the ground surface into subsurface soil or the penetration of water from the soil into sewer or other pipes through defective joints, connections or manhole walls.

Inorganic Compounds
Compounds that either do not contain carbon or do not contain hydrogen along with carbon. Inorganic compounds include metals, salts and various carbon oxides (carbon monoxide, carbon dioxide). These compounds do not combust in incinerators.

Interim Measure
A near term stabilization tool that is used to slow or stop contamination migration and thereby reducing the risk to human health and the environment.

Land Treatment

Any activity or project to improve conservation of soil, water or other resources and improve productive use of the resource.

Leachate

A phrase produced by the movement or percolation of liquid through soil or solid waste, and the subsequent dissolution of certain constituents in the water.

Leachate Collection System

A system that gathers leachate from a landfill and pumps it to the surface for treatment.

Less than Detection Limit (NonDetect)

A phrase which indicates that a chemical constituent was either not identified or not quantified at the lowest level of sensitivity of the analytical method being employed by the laboratory. The chemical constituent is either not present in the sample, or it is present in such a small concentration that it cannot be measured by the analytical procedure.

Level 1 Ecological Risk Assessment

An ecological risk assessment which is designed to determine if there were current or past releases and determine if there are important ecological resources present or in the locality of the site.

Listed Waste

Wastes identified as hazardous under RCRA but which have not been subjected to the Toxic Characteristics Listing Process because the dangers they present are considered self evident.

Maximum Contaminant Level (MCL)

The highest concentration of a solute permissible in a public water supply, as specified in the National Primary Drinking Water Standards established under the Safe Drinking Water Act (SDWA) by U.S. EPA.

Monitoring Well

A well that is constructed by one of a variety of techniques for the purpose of extracting ground waste for physical, chemical, or biological testing, or for measuring water levels.

National Primary Drinking Water Regulation

The primary drinking water standard that is legally enforceable. Primary standards protect drinking water by limiting the levels of specific contaminants.

National Secondary Drinking Water Regulation

Secondary drinking water standards are non-enforceable guidelines regarding contaminants that may cause cosmetic effects such as skin or tooth discoloration, or aesthetic effects such as taste, color or odor.

NonAqueous Phase Liquid (NAPL)

Liquids, commonly a mixture of several different chemicals that are either denser or less dense than water. Dense NAPL (DNAPL), such as chlorinated solvents, will sink if it enters ground water; less dense, or light NAPL (LNAPL), such as gasoline, will float on the water table. NAPL in the subsurface can be a persistent source of ground water contamination due to its low solubility and viscosity.

Noncarcinogenic Risk

The potential for noncarcinogenic health effects to an individual as a result of exposure to contaminants in the environment.

Nonpoint Source

A source of contamination in which the contaminant enters the receiving water in an intermittent and/or diffuse manner.

Operations and Maintenance

A plan that defines long-term measures that will be implemented at a site, after the initial remedial actions, to assure that a remedy remains protective of human health and the environment.

Organic Compounds

Naturally occurring (animal or plant-produced or synthetic) substances containing mainly carbon, hydrogen, nitrogen and oxygen.

Parts per Billion (ppb)

The concentration of a substance in air, water or soil. One ppb means that there is one part of a substance for every billion parts of the air, water or soil in which it is measured. One ppb is about one drop of dye in 18,000 gallons of water or about one second in 32 years. One ppb is 1,000 times less than one part per million.

Parts per Million (ppm)

The concentration of a substance in air, water or soil. One ppm means that there is one part of a substance for every million parts of the air, water or soil in which it is measured. One ppm is about one drip of dye in 18 gallons of water, about one inch in 16 miles, or one penny in $10,000.

Permeable

A property of a material or soil that allows the movement or passage of water.

Piezometer

An instrument used to measure head at a point in the subsurface; a non pumping well, generally of small diameter that is used to measure the elevation of the water table or potentiometric surface.

Piezometric Head

The measure of the pressure in the aquifer.

Piezometric Surface

The surface defined by the levels to which ground water will rise in tightly cased wells that tap an aquifer.

Point Source

Any specific starting place of pollution discharge, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, or watercraft.

Plume

A body of contaminated ground water originating from a specific source and influenced by such factors as the local ground water flow pattern, density of the contaminant, and character of the aquifer.

Polycyclic Aromatic Hydrocarbons (PAH)

PAHs are a group of chemical s that are formed during the incomplete burning of coal, oil gas, wood, garbage, or other organic substances, such as tobacco and charbroiled meat. There are more than 100 different PAHs. PAHs generally occur as complex mixtures (for example, as part of combustion products such as soot), not as single compounds. PAHs usually occur naturally, but they can be manufactured as individual compounds for research purposes; however, not as the mixtures found in combustion products. As pure chemicals, PAHs generally exist as colorless, white, or pale yellow- green solids. They can have a faint, pleasant odor. A few PAHs are used in medicines and to make dyes, plastics, and pesticides. Others are contained in asphalt used in road construction. They can also be found in substances such as crude oil, coal, coal tar pitch, creosote, and roofing tar. They are found throughout the environment in the air, water, and soil.

Polychlorinated Biphenyls (PCBs)

A group of synthetic, organic, chlorinated, aromatic hydrocarbons having various industrial applications. They are highly toxic, poisonous and potentially carcinogenic environmental pollutants known to cause skin diseases. They tend to accumulate in animal tissues and are suspected of causing birth defects and cancer.

RCRA Corrective Action

Pursuant to the 1984 Hazardous and Solid Waste Amendment (HSWA) to RCRA, all sites seeking a hazardous waste permit are required to institute Corrective Action as necessary to protect human health and the environment for all releases of hazardous waste or constituents from any waste management unit at the facility, regardless of the time at which the waste was placed in such unit.

RCRA Facility Assessment (RFA)

The RFA documents environmental conditions at the facility in regard to past and present waste management activities. All related facility files are reviewed and a visual on-site evaluation is also performed. The final RFA document identifies all waste management units and areas of concern and indicates if either a release of hazardous waste or constituents has occurred or if the potential for such a release exists. Conclusions and recommendations are included for each unit or area regarding the need for further investigation and/or some type of corrective action.

RCRA Facility Investigation (RFI)

The RFI is used to determine if a hazardous substance was released, the level of detectable contaminant, and the likely spread of the hazardous or potentially hazardous pollutant. This information is collected to support the choice of a cleanup remedy to reduce or eliminate the risks associated with contamination at a site.

Resource Conservation and Recovery Act (RCRA)

RCRA is a Federal law that established a regulatory system to track hazardous substances from their generation to their disposal. It requires the use of safe and secure procedures in treating, transporting, storing and disposing of hazardous substances. RCRA was enacted in 1976.

Responsiveness Summary

A summary of all comments received from the public on the Statement of Basis and RFI Report and Ohio EPA's response to those comments.

Risk Assessment

The process used to determine the threats posed by a hazardous constituent(s). Elements include data collection/evaluation of the hazardous constituents present in the environmental

media; assessment of exposure and exposure pathways; assessment of the toxicity of the hazardous constituents; and characterization of human health and ecological risk.

Risk Clean Number

A risk-based clean level for a specific chemical, developed with generic default values in the same equations used to calculate risk, that when used appropriately can be substituted for a site-specific risk assessment to meet the applicable performance standards.

Safe Drinking Water Act

An act passed by Congress that gave U.S. EPA the authority to set drinking water standards.

Saturated Zone

That part of the earth's crust in which all voids are filled with water. The water table is the top of the saturated zone in an unconfined aquifer.

Screening Levels/intervals

The intervals in a ground water monitoring well where the samples are taken or the interval between the upper and the lower extents of the screen of a ground water well through which the sample is taken. Maximum screening interval usually is 5 feet.

Screening Risk Assessment

Concentrations in a medium such as soil, water, sediment, or air which are considered safe for a substance based on the substance's mobility and toxicity.

SemiVolatile Organic Compound (SVOC)

An organic substance that evaporates slowly at standard temperature (20°C).

Soil Boring (or Boring)

A circular hole made in the ground by an auger, mechanical drill rig, or direct-push technology to collect soil samples deep in the ground. Representative samples are collected for testing to see if the subsoil has been contaminated. Sometimes these borings are converted into ground water monitoring wells.

Stabilization/Interim Measures

Stabilization/interim measures are used to control or abate threats to human health and/or the environment from releases and/or to prevent or minimize the further spread of contamination while long-term remedies are pursued.

Standard Industrial Classification

A standard series of four-digit codes created by the U.S. government for categorizing business activities.

Statement of Basis

- Summarizes information contained in RFI/CMS reports and the administrative record.
- Solicits public comment on all possible alternatives, including alternatives that may not have been identified in the CMS.
- Is a public participation document and expected to be widely read.
- Describes the proposed remedy, but does not select the final remedy.

Surface Water

The portion of water that appears on the land surface (e.g., oceans, lakes and rivers).

Toxicity

A measure of the poisonous or harmful nature of a substance.

Treatment, Storage, & Disposal Facility (TSDF)

A facility where hazardous waste is treated, stored, or disposed. A Hazardous Waste Installation and Operation Permit is required for these activities.

Turbidity

Cloudiness in water due to suspended and colloidal organic and inorganic material.

Unfiltered Ground Water Sample

The ground water sample is directly placed into an appropriate container after being removed from the well. The sample is not pumped through a filter as it is in a filtered sample.

Unsaturated Zone

The zone between the land surface and the water table. The pore spaces contain water at less than atmospheric pressure, as well as air and other gases. Also called vadose zone and zone of aeration.

U.S. EPA Region 9 Residential Direct Contact Preliminary Remediation Goals

Developed by U.S. EPA Region 9, they are concentrations in soil or water which are considered safe for a substance based on the substance's mobility and toxicity.

Visual Site Inspection

An on-site inspection to visibly verify site conditions, waste management units, areas of concern, and potential releases.

Volatile Organic Compound (VOC)

Any organic compound that evaporates readily to the atmosphere. VOCs contribute significantly to photochemical smog production, air pollution and certain health problems.

Waste Management Unit (WMU)

Any unit at a facility at which wastes have been placed at any time, irrespective of whether the unit was intended for management of solid or hazardous waste.

Wastewater

Spent or used water from an individual home, community, farm or an industry that contains dissolved or suspended substances.

Water Table

The surface in a ground water body at which the pore water pressure is atmospheric. It can be measured by installing shallow well extending a few feet into the zone of saturation and then measuring the water level in those wells.

Appendix A
Guidance Documents

Listed below are technical guidance documents that may be helpful in conducting RCRA Corrective Action projects. These documents have not been adopted or endorsed by Ohio EPA, but should be considered as potential tools for performing Corrective Action work. The links to documents on web sites were functional at the time this Handbook was issued; however, the web sites continue to evolve. The DHWM will periodically check and update the links to enhance access to the guidance documents.

Air Sparging see Treatment Technologies

Air Stripping see Treatment Technologies

Activated Carbon see Treatment Technologies

Bioremediation see Treatment Technologies

Characterization Technologies

Title: CluIn Hazardous Waste Cleanup Information Web Page
Author: U.S. EPA
Date: Updated continuously
Availability: http://cluin.org/
Description: An excellent guide to site characterization. Provides an online site characterization screening matrix.

Title: The Use of Field Methods to Support RFI Streamlining
Author: U.S. EPA Region 5
Date: June 20, 1997
Availability: http://www.epa.gov/reg5rcra/ca/rfi.htm
Description: Memo from Norman Niedergang offering guidelines for implementing appropriately selected field methods for Corrective Action.

Title: Standard Practice for Expedited Site Characterization of Vadose Zone and Ground Water Contamination at Hazardous Waste Contaminated Sites
Author: ASTM
Document #: D623598
Date: November 1998
Availability: Annual book of ASTM standards
Description: This standard provides guidelines for conducting an expedited site characterization.

Corrective Action Management Units (CAMUs)

Title: Corrective Action Management Units and Temporary Units
Author: U.S. EPA
Document #: 58 FR 8658
Date: February 16, 1993
Availability: http://www.epa.gov/epawaste/hazard/correctiveaction/resources/guidance/remwaste/refrnces/02camutu.pdf
Description: Published final rule for CAMUs and TU.

Title: RCRA Corrective Action Remedy Selection/ CAMU Training Course
Author: U.S. EPA OSW
Date: September 1993
Availability: CO ERAS
Description: Course manual from U.S. EPA training course held in Chicago.

Title: Amendments to the Corrective Action Management Rule; Proposed Rule
Author: U.S. EPA
Document #: 65 FR 51080
Date: August 22, 2000
Availability: http://www.epa.gov/epawaste/hazard/correctiveaction/resources/guidance/acamur.htm
Description: Proposed amendments to the CAMU rule.

Corrective Measures Implementation (CMI) - CMI Scope of Work, see Program Implementation

Corrective Measures Study (CMS) - CSI Scope of Work, see Program Implementation

Data Quality Objectives (DQOs)

Title: Tier I Data Validation Manual
Author: Ohio EPA, DHWM
Date: February 7, 2006
Availability: http://www.epa.ohio.gov/portals/32/pdf/TierIDVManual.pdf
Description: Ohio EPA DHWM guidance on Tier I data validation.

Title: Guidance for Data Quality Assessment: Practical Methods for Data Analysis
Author: U.S. EPA
Document #: EPA/600/R-96/084 (EPA QA/G-9)
Date: July 2000
Availability: http://www.clu-in.org/conf/tio/pasi_121603/g9-final.pdf
Description: Tools and Techniques for analyzing data.

Title: Guidance on Systematic Planning Using the Data Quality Objectives Process
Author: U.S. EPA
Document #: EPA/240/B06/001 (EPA QA/G4)
Date: February 2006
Availability: http://www.epa.gov/quality/qa_docs.html
Description: Includes both decision making and estimation using the DQO process.

Title: Data Quality Evaluation Statistical Toolbox (DATA Quest) Users Guide
Author: U.S. EPA ORD
Document #: EPA/600/R96/085 (EPA QA/G9D)
Date: December 1997
Availability: http://itep68.itep.nau.edu/itep_downloads/DAI%20resources/DataQuest/dataquest%20guide%209d.pdf
Description: Users guide for the DATA Quest software package.

Title: Data Quality Objectives Decision Error Feasibility Trials (DQO/DEFT)
Author: U.S. EPA ORD
Document #: EPA/600/r96/056
Date: September 1994
Availability: http://www.epa.gov/quality/qs-docs/g4d-final.pdf
Description: User's guide for DQO/DEFT software.

Title: RCRA Corrective Action Data Review Guidance Manual
Author: U.S. EPA Region 9
Availability: CO ERAS
Description: Guide for determining quality of obtained data.

Data Validation see Data Quality Objectives

Ecological Risk Assessment

Title: Guidance for Conducting RCRA Ecological Risk Assessments
Author: Ohio EPA
Date: March 2003
Availability: http://www.epa.ohio.gov/portals/32/pdf/March%20ERAG.pdf
Description: Ohio EPA's guidance for performing ecological risk assessments.

Title: Guidelines for Ecological Risk Assessment
Author: U.S. EPA
Document #: EPA/630/R95/002F
Date: April 1998
Availability: http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=12460
Description: Primary guidance for ecological risk assessment review.

Title: Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments
Author: U.S. EPA
Document #: EPA/540/R97/006
Date: June 5, 1997
Availability: http://www.epa.gov/oswer/riskassessment/ecorisk/ecorisk.htm
Description: Guidance for Superfund ecological risk assessments. This guidance should be used as supplemental information to the Eco Risk Guidelines.

Title: Ecological Risk Assessment for RCRA Corrective Action
Author: U.S. EPA Region 5
Date: October 1994
Availability: CO ERAS
Description: Interim draft document that may be used as supplemental guidance to the Eco Risk Guidelines.

Title: Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference Document
Author: U.S. EPA
Document #: EPA/600/389/013
Date: March 1989
Availability: CO ERAS

Title: Ecological Data Quality Levels, RCRA Appendix IX Hazardous Constituents
Author: U.S. EPA Region 5
Date: August 18, 1997
Availability: CO ERAS

Title: ECO Update: The Role of BTAGS in Ecological Assessment
Author: U.S. EPA OSWER
Document #: 9345.005I Vol. 1 No. 1
Date: September 1991
Availability: CO ERAS

Title: ECO Update: The Role of Natural Resource Trustees in the Superfund Process
Author: U.S. EPA OSWER
Document #: 9345.005I Vol. 1 No. 3
Date: March 1992
Availability: CO ERAS

Title: ECO Update: Ecological Assessment of Superfund Sites: An Overview
Author: U.S. EPA OSWER
Document #: 9345.005I Vol. 1 No. 2
Date: December 1991
Availability: CO ERAS

Title: ECO Update: Developing a Work Scope for Ecological Assessments
Author: U.S. EPA OSWER
Document #: 9345.005I Vol. 1 No. 4
Date: May 1992
Availability: CO ERAS

Title: ECO Update: Briefing the BTAG: Initial Description of Setting, History, and Ecology of a Site
Author: U.S. EPA OSWER
Document #: 9345.005I Vol. 1 No. 5
Date: August 1992
Availability: CO ERAS

Title: ECO Update: Using Toxicity Tests in Ecological Risk Assessment
Author: U.S. EPA OSWER
Document #: 9345.005I Vol. 2 No. 1
Date: September 1994
Availability: CO ERAS

Title: ECO Update: Catalogue of Standard Toxicity Tests for Ecological Risk Assessment
Author: U.S. EPA OSWER
Document #: 9345.005I Vol. 2 No. 2
Date: September 1994
Availability: CO ERAS

Title: ECO Update: Field Studies for Ecological Risk Assessment
Author: U.S. EPA OSWER
Document #: 9345.005I Vol. 2 No. 3
Date: September 1994
Availability: CO ERAS

Title: ECO Update: Selecting and Using Reference Information in Superfund Ecological Risk Assessments
Author: U.S. EPA OSWER
Document #: 9345.005I Vol. 2 No. 4
Date: September 1994
Availability: CO ERAS

Environmental Indicators

Title: Interim-Final Guidance for RCRA Corrective Action Environmental Indicators
Author: U.S. EPA, E. Cotsworth, Acting Director, OSW
Date: February 5, 1999
Availability: http://www.epa.gov/epawaste/hazard/correctiveaction/eis/index.htm
Link is to a list of EI documents. Click on "EI guidance".
Description: Worksheets for documenting attainment of EIs.

Title: EI Training Slides
Author: U.S. EPA
Availability: http://www.epa.gov/epawaste/hazard/correctiveaction/eis/index.htm
Link is to a list of EI documents. Click on titles under "EI Training Slides"
Description: Slides that elaborate on Interim-Final Guidance for RCRA Corrective Action Environmental Indicators and provide examples of EI determinations.

Title: Supplemental Guidance for Environmental Indicator CA 750, Migration of Contaminated Groundwater Under Control: Groundwater-Surface Water Interactions
Author: U.S. EPA
Availability: CO ERAS
Description: Guidance on evaluating the impact of contaminated ground water on surface water for the purposes of EI 750.

Expedited Site Investigations see Characterization Technologies

Ground Water Investigations

Title: Technical Guidance Manual for Hydrogeologic Investigations and Groundwater Monitoring
Author: Ohio EPA DDAGW
Date: February 1995
Availability: http://www.epa.ohio.gov/ddagw/tgmweb.aspx
Description: Identifies technical considerations for hydrogeologic investigations and ground water monitoring at potential or known water pollution sources.

Title: Compendium of ERT Groundwater Sampling Procedures
Author: U.S. EPA ERT
Document #: OSWER Directive 9360.406
Date: January 1991
Availability: http://www.epa.gov/region09/qa/pdfs/fieldsamp-ertsops.pdf

Title: Groundwater Handbook Volume I: Groundwater and Contamination
Author: U.S. EPA
Document #: EPA/625/690/016a
Date: September 1990
Availability: CO ERAS

Title: Groundwater Handbook Volume II: Methodology
Author: U.S. EPA
Document #: EPA/625/690/016b
Date: July 1991
Availability: CO ERAS

Ground Water Point of Compliance see Program Implementation

Ground Water Remediation also see Presumptive Remedies

Title: Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action
Author: U.S. EPA
Document #: EPA/530/R01/015
Date: April 2004
Availability: http://www.epa.gov/epawaste/hazard/correctiveaction/resources/guidance/pdfs/gwhb041404.pdf
Description: U.S. EPA's interpretation of policies on topics such as ground water cleanup goals, point of compliance, source control, monitored natural attenuation, and others.

Title: Pump and Treat Ground Water Remediation
Author: U.S. EPA ORD
Document #: EPA/625/R95/005
Date: July 1996
Availability: CO ERAS
Description: An introduction into pump-and-treat ground water remediation.

Title: Methods for Monitoring Pump and Treat Performance
Author: U.S. EPA
Document #: EPA/600/R94/123
Availability: CO ERAS

Title: Guidance for Evaluating the Technical Impracticability of Ground Water Restoration
Author: U.S. EPA OSWER
Document #: 9234.225
Date: September 1993
Availability: http://www.epa.gov/superfund/health/conmedia/gwdocs/techimp.htm
Description: Clarifies how to determine if ground water restoration is impractical and if so, what alternative measures must be implemented to ensure that final remedy is protective.

Human Health Risk Assessment

Title: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part A)
Author: U.S. EPA
Document #: EPA/540/189/002
Date: December 1989
Availability: http://www.epa.gov/oswer/riskassessment/ragsa/index.htm
Link is to page with list of guidance documents. Click on subsections of RAGs Part A under "General Policy/Guidance".
Description: Primary guide for conducting Human Health Risk assessments. This document is referenced in the ANPR as guidance for HHRA submitted with Corrective Action projects. Reviewers must refer to supplemental guidance when using RAGS (Calculating the Concentration Term, Standard Default Exposure Factors, etc.). Also available are materials from U.S. EPA training on RAGS.

Title: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)
Author: U.S. EPA
Document #: EPA/540/R-92/003 (9285.7-01B)
Date: December 1991
Availability: http://www.epa.gov/oswer/riskassessment/ragsb/index.htm
Description: Provides guidance on using EPA toxicity values and exposure information to derive risk-based preliminary remediation goals (PRGs).

Title: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part C, Risk Evaluation of Remedial Alternatives)
Author: U.S. EPA OERR
Document #: 9285.701C
Date: December 1991
Availability: http://www.epa.gov/oswer/riskassessment/ragsc/index.htm
Description: Provides guidance on evaluating human health risks associated with remedies being evaluated for selection, and during and after the remedy's implementation.

Title: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, Review of Superfund Risk Assessments)
Author: U.S. EPA OERR
Document #: 9285.701D
Date: January 1998
Availability: http://www.epa.gov/oswer/riskassessment/ragsd/index.htm
Description: Provides guidance on evaluating human health risks associated with remedies being evaluated for selection, and during and after the remedy's implementation.

Title: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)
Author: U.S. EPA
Document #: EPA-540-R-070-002 (OSWER 9285.7-82)
Date: January 2009
Availability: http://www.epa.gov/oswer/riskassessment/ragsf/index.htm
Description: Provides guidance for developing the information necessary to assist risk assessment and risk management decision-making at waste sites involving potential risks from inhalation exposure.

Title: Exposure Factors Handbook
Author: U.S. EPA
Document #: EPA/600/P95/002Fa
Date: August 1997
Availability: http://www.epa.gov/ncea/efh/
Description: Summarizes data on human behaviors and characteristics affecting exposures and recommends exposure factor values.

Title: Risk Assessment Guidance for Superfund (RAGS) Volume III - Part A: Process for Conducting Probabilistic Risk Assessment
Author: U.S. EPA
Document #: EPA 540R02002
Date: December 2001
Availability: http://www.epa.gov/oswer/riskassessment/rags3adt/
Description: Policies, guidance, discussion, and examples of Monte Carlo modeling techniques for estimating exposures and risks.

Title: Final Guidance for Data Usability in Risk Assessment Parts A&B
Author: U.S. EPA OSWER
Document #: 9285.709A
Date: April 1992
Availability: http://www.epa.gov/oswer/riskassessment/datause/parta.htm and
http://www.epa.gov/oswer/riskassessment/datause/partb.htm
Description: Provides basis for making decisions about the minimum quality and quantity of analytical data that are sufficient for making remedial action decisions.

Title: EPA Risk Characterization Program
Author: U.S. EPA
Date: March 21, 1995
Availability: http://epa.gov/OSA/spc/2riskchr.htm
Description: Memo from Director Carol Browner describing U.S. EPA policies for using risk assessments in waste programs decision making.

Innovative Treatment Technologies see Treatment Technologies

Interim Measures

Title: Stabilization Technologies for RCRA Corrective Action
Author: U.S. EPA ORD
Document #: EPA/625/691/026
Date: August 1991
Availability: CO ERAS
Description: Discusses containment technologies and some soil treatment and ground water treatment.

Title: RCRA Corrective Action Stabilization Technologies
Author: U.S. EPA ORD
Document #: EPA/625/R92/014
Date: October 1992
Availability: CO ERAS
Description: Discusses technologies for the stabilization initiative.

Lead

Title: Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children
Author: U.S. EPA
Document #: EPA/540/R93/081
Date: 1994
Availability: http://www.epa.gov/superfund/lead/products.htm
Description: Recommended approach for assessing residential lead risks.

Title: Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil
Author: U.S. EPA TRW for Lead
Document #: EPA-540-R-03-001
Date: January 2003
Availability: http://www.epa.gov/superfund/lead/products/adultpb.pdf
Description: Describes a methodology for assessing risks associated with nonresidential adult exposures to lead in soil.

Natural Attenuation

Title: Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water
Author: U.S. EPA
Document #: EPA/600/R98/128
Date: September 1998
Availability: http://www.epa.gov/superfund/health/conmedia/gwdocs/protocol.htm
Description: Guidance on data collection and analysis to evaluate monitored natural attenuation through biological processes for remediating ground water contaminated with chlorinated solvents

Title: Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tanks
Author: U.S. EPA OSWER
Document #: 9200.417
Date: April 1999
Availability: http://www.clu-in.org/download/reg/d9200417.pdf
Description: Clarifies U.S. EPA policy regarding the use of monitored natural attenuation for the remediation of contaminated soil and ground water.

Title: Low Cost Remediation Strategies
Author: Parsons Engineering Science, Inc.
Date: November 1997
Availability: CO ERAS
Description: Course manual from Parsons sponsored training course on low cost remediation strategies held at Kent State University.

Title: Natural Attenuation of Chlorinated Solvents in Groundwater
Author: RTDF/ ITRC
Date: March 1999
Availability: CO ERAS
Description: Course manual from seminar held in Evanston, IL in March, 1999. Excellent manual for documenting occurrence of natural attenuation.

National Corrective Action Prioritization System (NCAPS)

Title: RCRA NCAPS Guidelines
Author: U.S. EPA
Date: August 1992
Availability: CO ERAS
Description: Provides guidelines for scoring and ranking RCRA facilities under the National Corrective Action Prioritization System (NCAPS) developed to prioritize Corrective Action sites.

Preliminary Remediation Goal (PRG) see Screening Levels

Presumptive Remedies

Title: Presumptive Remedies: Policies and Procedures
Author: U.S. EPA
Document #: 9355.047FS
Date: September 1993
Availability: http://www.epa.gov/superfund/policy/remedy/presump/pol.htm
Description: General discussion of policy dealing with presumptive remedy application.

Title: Presumptive Remedy for CERCLA Municipal Landfill Sites
Author: U.S. EPA
Document #: 9355.049FS
Date: September 1993
Availability: http://www.epa.gov/superfund/policy/remedy/presump/clms.htm
Description: Presumptive remedy for landfills.

Title: Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soil
Author: U.S. EPA
Document #: 9355.4048FS
Date: September 1993
Availability: http://www.epa.gov/superfund/policy/remedy/presump/finalpdf/scts.pdf
Description: Presumptive remedy for VOCs in soils.

Title: Presumptive Remedies for Soils, Sediments, and Sludges at Wood Treating Sites
Author: U.S. EPA
Document #: 9200.5162
Date: December 1995
Availability: http://www.epa.gov/superfund/policy/remedy/presump/wood/wodtreat.pdf
Description: Presumptive remedy for wood treatment sites.

Title: Presumptive Remedy: Supplemental Bulletin Multi Phase Extraction (MPE) Technology for VOCs in Soil and Groundwater
Author: U.S. EPA OSWER
Document #: 9355.068F8
Date: April 1997
Availability: http://www.clu-in.org/download/toolkit/finalapr.pdf
Description: Additional information for VOC in soil presumptive remedy.

Title: Presumptive Response Strategy and Ex Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites
Author: U.S. EPA OSWER
Document #: 9283.112
Date: October 1996
Availability: http://www.epa.gov/superfund/health/conmedia/gwdocs/gwguide/index.htm
Description: Provides a presumptive response strategy for sites with contaminated groundwater. A good discussion of advantages/disadvantages of various treatment processes.

Title: Presumptive Remedies: CERCLA Landfill Caps RI/FS Data collection Guide
Author: U.S. EPA
Document #: 9355.318FS
Date: August 1995
Availability: CO ERAS
Description: Identifies data requirements pertinent to landfill cap design.

Program Implementation

Title: RCRA Corrective Action Plan
Author: U.S. EPA OSWER
Document #: 9902.32A
Date: May 1994
Availability:
http://www.epa.gov/epawaste/hazard/correctiveaction/resources/guidance/gen_ca/rcracap.pdf
Description: A comprehensive guide to the platter of items which might be included in Corrective Action projects. Provides a point-of-departure for work plan content, report formats and information requirements.

Title: Ohio Corrective Action Plan (Ohio CAP)
Author: Ohio EPA
Availability: http://epa.ohio.gov/portals/32/pdf/theplan.pdf
Description: Ohio EPA's general philosophy behind implementing the Corrective Action program.

Title: Use of the Corrective Action Advance Notice of Proposed Rulemaking as Guidance
Author: U.S. EPA OSWER
Date: January 17, 1997
Availability:
http://yosemite.epa.gov/osw/rcra.nsf/documents/8BF009F9B3672563852566110072DA71
Description: Memo from E. Laws, Assistant Administrator, OSWER, reaffirming US EPA's use of the May 1, 1996 ANPR (61 FR 19432) as Corrective Action guidance.

Title: Corrective Action Principles Memorandum
Author: U.S. EPA Region 5
Date: November 19, 1996
Availability: CO ERAS
Description: A brief memo from Norman Niedergang which outlines Region 5's policies for several key issues in the Corrective Action program, including points of compliance, use of screening levels, and future land use.

Title: Progress Under the Corrective Action Program is Limited, but New Initiatives may Accelerate Cleanups
Author: U.S. GAO
Document #: GAO/RCED983
Date: October 1997
Availability: CO ERAS
Description: Report to Congress from the United States General Accounting Office (GAO) describing the progress made within and recommendations for the Corrective Action program.

Public Participation also see Program Implementation

Title: RCRA Public Participation Manual
Author: U.S. EPA OSW
Date: 1996
Availability: http://www.epa.gov/epawaste/hazard/tsd/permit/pubpart/manual.htm
Description: Guidance manual for incorporating public participation into the RCRA program. Includes a chapter on public participation in Corrective Actions, both permit and order driven.

Pump and Treat Ground Water see Ground Water Remediation

Quality Assurance Project Plans

Title: RCRA QAPP Instructions
Author: U.S. EPA Region 5
Date: April 1998
Availability: http://www.epa.gov/reg5rcra/ca/modqapp2.pdf
Description: The guidance document to be used for all QAPPs prepared for RCRA Corrective Actions in Region 5. Provides a detailed set of requirements for QAPPs, and an example QAPP. Updates older QAPP guidance and incorporates current guidance, such as the Soil Screening Guidance.

Title: EPA guidance for Quality Assurance Project Plans
Author: U.S. EPA ORD
Document #: EPA/600/R98/018 (EPA QA/G5)
Date: February 1998
Availability: CO ERAS
Description: Supplemental guidance for preparing QAPPs. Covers a broader ranges of projects that the Region 5 RCRA QAPP.

Title: Preparation Aids for the Development of Category I Quality Assurance Project Plans
Author: U.S. EPA ORD
Document #: EPA/600/891/003
Date: February 1991
Availability: CO ERAS
Description: Supplemental guidance for preparing QAPPs. Category I QAPPs provide for the most stringent QA and are used for Corrective Action projects.

Title: Preparation Aids for the Development of Category II Quality Assurance Project Plans
Author: U.S. EPA ORD
Document #: EPA/600/891/004
Date: February 1991
Availability: CO ERAS
Description: Supplemental guidance for preparing QAPPs.

Title: Preparation Aids for the Development of Category III Quality Assurance Project Plans
Author: U.S. EPA ORD
Document #: EPA/600/891/005
Date: February 1991
Availability: CO ERAS
Description: Supplemental guidance for preparing QAPPs.

Title: Preparation Aids for the Development of Category IV Quality Assurance Project Plans
Author: U.S. EPA ORD
Document #: EPA/600/891/006
Date: February 1991
Availability: CO ERAS
Description: Supplemental guidance for preparing QAPPs. Category IV QAPPs provide for the least stringent QA.

Regulations

Title: Management of Remediation Waste Under RCRA
Author: U.S. EPA OSWER
Document #: EPA530-F-98-026
Date: October 1998
Availability: http://epa.gov/superfund/policy/remedy/pdfs/530f-98026-s.pdf
Description: Provides a summary of rules applicable to management of remediation wastes generated during corrective actions.

Title: Advanced Notice of Proposed Rulemaking (ANPR), Corrective Action for Releases from Solid Waste Management Units
Author: U.S. EPA
Document #: 61 FR 19432
Date: May 1, 1996
Availability: http://www.epa.gov/epawaste/hazard/correctiveaction/resources/guidance/anpr.htm
Description: The primary reference for U.S. EPA policy regarding key issues in the Corrective Action program.

Title: Corrective Action for Releases from Solid Waste Management Units at Hazardous Waste Management Facilities
Author: U.S. EPA
Date: June 3, 1996
Availability: CO ERAS
Description: Transcript from May 1, 1996 ANPR public hearing. Industry representatives provide their views on the Corrective Action program and offer suggestions for improvement.

Title: Post Closure Rule
Author: U.S. EPA
Document #: 63 FR 56710
Date: October 22, 1998
Availability: http://www.epa.gov/fedrgstr/EPA-WASTE/1998/October/Day-22/f28221.htm
Description: Final post closure rule provides flexibility to U.S. EPA to defer closure requirements for land based units to the Corrective Action program.

Title: Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilties: Partial Withdrawal of Rulemaking Proposal
Author: U.S. EPA
Date: October 7, 1999
Availability: http://www.epa.gov/EPA-WASTE/1999/October/Day-07/f26070.htm
Description: Withdrawal of the 1990 proposed subpart S regulations for Corrective Action.

RCRA Facility Assessment (RFA)

Title: RCRA Facility Assessment (RFA) Guidance
Author: U.S. EPA OSW
Document #: EPA/530/sw86/053
Date: October 1986
Availability: http://www.epa.gov/epawaste/hazard/correctiveaction/resources/guidance/sitechar/rfaguid.pdf

Title: RCRA Facility Assessment Training
Author: A.T. Kearney
Date: February 1990
Availability: CO ERAS
Description: Course manual from RFA training session offered by Region 5. A series of slides from the training which discusses file searches, preliminary reviews, visual site inspections, and RFA report review.

Title: Guidance for Performing Preliminary Assessments Under CERCLA
Author: U.S. EPA OERR
Document #: EPA/540/G91/013
Date: September 1991
Availability: CO ERAS
Description: A CERCLA guidance document which provides instruction for conducting a preliminary assessment, including important information requirements, and how to obtain information through file searches, desktop investigations, and site reconnaissance. These information gathering techniques can be applied to Corrective Action facilities.

RFA Scope of Work see Program Implementation

RCRA Facility Investigation (RFI)

Title: Interim Final RCRA Facility Investigation (RFI) Guidance Volumes I-V
Author: U.S. EPA
Document #: EPA/530/sw89031
Date: March 1989
Availability: http://www.epa.gov/epawaste/hazard/correctiveaction/resources/guidance/sitechar/index.htm
Description: Comprehensive guide to obtaining information to fully characterize the nature, extent and rate of migration of releases of hazardous wastes or constituents and to interpret this information to determine whether interim corrective measures and/or a Corrective Measures Study may be necessary. Includes over 30 case studies illustrating important aspects of site characterization.

Title: Tier I Data Validation Manual
Author: Ohio EPA, DHWM
Date: February 7, 2006
Availability: http://epa.ohio.gov/portals/32/pdf/TierIDVManual.pdf
Description: Comprehensive guide to obtaining information to fully characterize the nature, extent and rate of migration of releases of hazardous wastes or constituents and to interpret this information to determine whether interim corrective measures and/or a Corrective Measures Study may be necessary. Includes over 30 case studies illustrating important aspects of site characterization.

RFI Scope of Work see Program Implementation

Remedy Selection

Title: Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents
Author: U.S. EPA, OSWER
Document #: EPAR98031
Date: July 1999
Availability: http://www.epa.gov/superfund/policy/remedy/rods/index.htm
Description: Describes roles and responsibilities of stakeholders in remedy selection process. Explains how to address changes in proposed and selected remedies.

Title: Remediation Technologies Screening Matrix and Reference Guide Ver. 4.0
Author: Federal Remediation Technologies Roundtable
Availability: http://www.frtr.gov/matrix2/top_page.html
Click on Screening Matrix
Description: An excellent resource for evaluating remedial alternatives. Can be viewed online.

Title: Risk Assessment Guidance for Superfund: Volume I Human Health Evaluation Manual (Part C, Risk Evaluation of Remedial Alternatives)
Author: U.S. EPA OERR
Document #: 9285.701C
Date: December 1991
Availability: CO ERAS
Description: Provides guidance on evaluating human health risks associated with remedies being evaluated for selection, and during and after the remedy's implementation.

Title: Corrective Action: Technologies and Applications
Author: U.S. EPA
Document #: EPA/625/489/020
Date: September 1989
Availability: CO ERAS
Description: Discusses various remedial technologies and their applications in a general sense.

Title: Rules of Thumb for Superfund Remedy Selection
Author: U.S. EPA OSWER
Document #: 9355.069
Date: August 1997
Availability: http://www.epa.gov/superfund/policy/remedy/rules/index.htm
Description: A general guide to policy considerations for remedy selection.

Title: Remedial Design/ Remedial Action Handbook
Author: U.S. EPA OERR
Document #: EPA 540/R95/059
Date: June 1995
Availability: http://www.epa.gov/superfund/cleanup/rdrabook.htm
Description: Provides guidance to project managers in the Superfund program. Many aspects do not apply to Corrective Actions, however, several project management principals are introduced which are applicable to any remedial project.

Title: Feasibility Study Analysis for CERCLA Sites with VOCs in Soil
Author: U.S. EPA
Document #: 9356.001
Date: August 1994
Availability: CO ERAS
Description: An evaluation of remedies studied at over 20 superfund sites with VOC soil contamination. Summarizes why particular remedies were or were not selected. May help to narrow the focus of remedies selected for study following the presumptive remedy selection approach.

Title: Feasibility Study Analysis for CERCLA Municipal Landfill Sites
Author: U.S. EPA
Document #: 9356.003
Date: August 1994
Availability: CO ERAS
Description: An evaluation of remedies studied at over 30 superfund sites with municipal landfills. Summarizes why particular remedies were or were not selected. May help to narrow the focus of remedies selected for study following the presumptive remedy selection approach.

Title: Guide for Conducting Treatability Studies Under CERCLA: Biodegradation Remedy Selection
Author: U.S. EPA
Document #: EPA/540/R35/519a
Date: August 1993
Availability: http://www.epa.gov/superfund/policy/remedy/pdfs/540r-93519b-s.pdf
Description: A guide for biodegradation remedy selection.

Title: Guide for Conducting Treatability Studies Under CERCLA: Aerobic Biodegradation Remedy Screening
Author: U.S. EPA
Document #: EPA/540/291/013B
Date: July 1991
Availability: CO ERAS
Description: A guide for aerobic biodegradation remedy selection.

Sampling

Title: DHWM Sampling Manual
Author: Ohio EPA DHWM
Date: May 1998
Availability: CO ISU
Description: A comprehensive guide to environmental media sampling.

Title: Sediment Sampling Guide and Methodologies
Author: Ohio EPA
Date: November 2001
Availability: http://www.epa.ohio.gov/portals/35/guidance/sedman2001.pdf
Description: A guide for sediment sampling. Discusses appropriate tools, methods, and sampling plan development.

Title: Compendium of ERT Soil Sampling and Surface Geophysics Procedures
Author: U.S. EPA ERT
Document #: OSWER Directive 9360.402
Date: January 1991
Availability: CO ERAS
Description: Summary of various methods for soil sampling and surface geophysical investigation.

Title: New Methods for Preservation of Volatile Organic Compounds in Soil
Author: Ohio EPA, DHWM
Date: June 17, 1998
Availability: http://epa.ohio.gov/portals/32/pdf/new_methods.pdf
Description: DHWM recommendations regarding Methods 5021 and 5035 for soil sampling.

Screening Levels

Title: Soil Screening Guidance: User's Guide
Author: U.S. EPA OSWER
Document #: 9355.423
Date: April 1996
Availability: CO ERAS
Description: Provides a set of standard equations for calculating site specific screening levels. Should only be used in conjunction with the Technical Background Document. A good introduction into the soil screening guidance. Includes information on surface and subsurface sampling, including locations and number of samples. Primary guidance for developing screening levels.

Title: Soil Screening Guidance: Technical Background Document
Author: U.S. EPA OSWER
Document #: EPA/540/R95/128
Date: July 1996
Availability: http://www.epa.gov/superfund/health/conmedia/soil/introtbd.htm
Description: Provides a much more detailed look at the development of standard equations provided in the User's Guide. Also provides a listing of generic screening levels developed with the standard equations using default parameters. Primary guidance for developing screening levels. Includes information on surface and subsurface sampling, including locations and number of samples.

Title: Region 9 Preliminary Remediation Goals (PRGs)
Author: U.S. EPA Region 9
Date: Updated regularly
Availability: http://www.epa.gov/region09/superfund/prg/index.html
Description: A set of widely used risk-based screening levels developed for industrial and residential soil, and drinking water. Updated periodically, check the web page for changes and a discussion of the exposure pathways used to develop the PRGs.

Title: Risk Assessment Guidance for Superfund: Volume I Human Health Evaluation Manual (Part B, Development of Riskbased Preliminary Remediation Goals)
Author: U.S. EPA
Document#: EPA/540/R-92/003 (9285.7-01B)
Date: December 1991
Availability: http://www.epa.gov/oswer/riskassessment/ragsb/index.htm
Description: Guidance for developing risk-based PRGs. The Soil Screening Guidance should be used as a primary guidance.

Slurry Walls see Treatment Technologies

Soil Vapor Extraction (SVE) see Treatment Technologies

Solidification/Stabilization see Treatment Technologies

Statistics

Title: Closure Plan Review Guidance for RCRA Facilities
Author: Ohio EPA DHWM
Date: March 2008
Availability: http://epa.ohio.gov/portals/32/pdf/2008CPRG.pdf
Description: The CPRG includes guidance for statistical evaluation of hazardous waste constituent levels in soil.

Title: RCRA Waste Sampling Draft Technical Guidance
Author: U.S. EPA
Document #: EPA530D02002
Date: August 2002
Availability: http://www.epa.gov/epawaste/hazard/testmethods/sw846/samp_guid.htm
Description: Appendix F of this document has guidance on the statistical analysis of environmental monitoring data.

Steam Extraction see Treatment Technologies

Streamlining Corrective Action

Title: RCRA Corrective Action Training: Strategies for Meeting the 2020 Vision
Author: U.S. EPA
Date: February 2009
Availability: http://www.epa.gov/epawaste/hazard/correctiveaction/training/vision/
Description: Slide presentation from 2009 RCRA Corrective Action Training: Strategies for Meeting the 2020 Vision.

Title: Region 6's Corrective Action Strategy
Author: U.S. EPA
Date: November 2008
Availability: http://www.epa.gov/earth1r6/6pd/rcra_c/pd-o/riskman.htm
Description: Guideline to accelerate corrective action by prioritizing site and streamlining administrative procedures.

Title: The Use of Field Methods to Support RFI Streamlining
Author: U.S. EPA Region 5
Date: June 20, 1997
Availability: http://www.epa.gov/reg5rcra/ca/rfi.htm
Description: Memo form Norman Niedergang offering guidelines for implementing appropriately selected field methods for Corrective Action.

Temporary Units see Corrective Action Management Units (CAMU)

Thermal Treatment see Treatment Technologies

Treatment Technologies

Title: Innovative Site Remediation Technology: Vacuum Extraction and Air Sparging
Author: U.S. EPA
Document#: EPA 542B97010
Date: May 1998
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Excellent reference on the application, design, and operation of innovative technologies.

Title: Innovative Site Remediation Technology: Liquid Extraction Technologies
Author: U.S. EPA
Document#: EPA 542B97006
Date: May 1998
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Excellent reference on the application, design, and operation of innovative technologies.

Title: Innovative Site Remediation Technology: Thermal Destruction
Author: U.S. EPA
Document#: EPA 542B97009
Date: May 1998
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Excellent reference on the application, design, and operation of innovative technologies.

Title: Innovative Site Remediation Technology: Bioremediation
Author: U.S. EPA
Document#: EPA 542B97004
Date: May 1998
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Excellent reference on the application, design, and operation of innovative technologies.

Title: Bioremediation of Hazardous Wastes
Author: U.S. EPA
Document #: EPA/600/R92/126
Date: August 1992
Availability: CO ERAS
Description: A discussion of research in site characterization, performance evaluation, and modeling as it relates to bioremediation.

Title: Superfund Innovative Technology Evaluation Program: Technology Profiles
Author: U.S. EPA
Document#: EPA 540R97502
Date: December 1996
Availability: CO ERAS
Description: Excellent reference on the application of innovative remedial technologies. May be used to determine potential innovative remedial alternatives, complete with pilot study results and contact information.

Title: Engineering Bulletin: Slurry Walls
Author: U.S. EPA
Document#: EPA 540 S92 008
Date: October 1992
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of slurry walls.

Title: Engineering Bulletin: Air Stripping of Aqueous Solutions
Author: U.S. EPA
Document#: EPA 540 291 022
Date: October 1991
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of air stripping.

Title: Engineering Bulletin: In Situ Soil Vapor Extraction
Author: U.S. EPA
Document#: EPA 540 291 006
Date: May 1991
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of in situ SVE.

Title: Engineering Bulletin: In Situ Steam Extraction
Author: U.S. EPA
Document#: EPA 540 291 005
Date: May 1991
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of in situ steam extraction.

Title: Engineering Bulletin: Granular Activated Carbon Treatment
Author: U.S. EPA
Document#: EPA 540 291 024
Date: October 1991
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of activated carbon treatment.

Title: Engineering Bulletin: Rotating Biological Contactors
Author: U.S. EPA
Document#: EPA 540 S92 007
Date: October 1992
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of RBCs.

Title: Engineering Bulletin: Slurry Biodegradation
Author: U.S. EPA
Document#: EPA 540 290 016
Date: September 1990
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of slurry biodegradation.

Title: Bioremediation Using the Land Treatment Concept
Author: U.S. EPA
Document#: EPA 600 R93 164
Date: August 1993
Availability: CO ERAS
Description: Reference on applicability, description, and design of Land treatment bioremediation.

Title: Engineering Bulletin: In Situ Biodegradation Treatment
Author: U.S. EPA
Document#: EPA 540 S94 502
Date: April 1994
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of in situ biodegradation.

Title: Engineering Bulletin: Solvent Extraction
Author: U.S. EPA
Document#: EPA 540 S94 503
Date: April 1994
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of solvent extraction.

Title: Engineering Bulletin: Thermal Desorption Treatment
Author: U.S. EPA
Document#: EPA 540 S94 501
Date: February 1994
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of thermal desorption.

Title: Engineering Bulletin: Solidification/Stabilization of Organics and Inorganics
Author: U.S. EPA
Document#: EPA 540 S92 015
Date: May 1993
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of solidification/stabilization.

Title: Engineering Bulletin: In Situ Vitrification Treatment
Author: U.S. EPA
Document#: EPA 540 S94 504
Date: October 1994
Availability: http://nepis.epa.gov/epa/html/pubs/pubtitleoswer.htm
Description: Reference on applicability and description of in situ vitrification.

Title: Stabilization/Solidification of CERCLA and RCRA Wastes
Author: U.S. EPA ORD
Document #: EPA/625/689/022
Date: May 1989
Availability: CO ERAS
Description: Description of physical and chemical testing procedures, technology screening, and field activities associated with stabilization/ solidification.

Title: Handbook for Stabilization/Solidification of Hazardous Wastes
Author: U.S. EPA
Document #: EPA/540/286/001
Date: June 1986
Availability: CO ERAS
Description: Provides designers and reviewers with information and guidance on the feasibility of solidification/stabilization.

Title: Engineering Issue: In Situ Bioremediation of Contaminated Unsaturated Subsurface Soils
Author: U.S. EPA
Document #: EPA/540/S93/501
Date: May 1993
Availability: CO ERAS
Description: Provides an overview of the factors involved in insitu bioremediation, including information requirements, advantages, and limitations of this technology.

Appendix B
Boilerplate Project Management Plan & Example Plan

A template for a Project Management Plan and an example of a Project Management Plan follow this page

Boilerplate Project Management Plan

1.0 Project Information

Project Name:	[project name]
Facility Mailing Address:	[facility name] [mailing street & number/ PO Box] [city, state, zip code]
Facility Physical Address:	[describe physical location] [county] County [city],Ohio
Facility Contact:	[facility contact name] [phone number] [fax number]
Project Vehicle:	[Permit, Consent Order, or Unilateral Order]
Miscellaneous:	[miscellaneous information]

2.0 Project Objectives

[Briefly describe the objectives of the project, as viewed by Ohio EPA, in a paragraph. Provide a specific list of objectives if it is helpful]

3.0 Organizational Structure

[Provide a paragraph which describes the organizational structure of the project, complete with member names and duties. Use the boilerplate organization tree to represent the structure graphically.

[project coordinator name]
Project Coordinator
|
Technical Review Team
|

[member name]	[member name]	[member name]	[member name]
[member title]	[member title]	[member title]	[member title]
[member duties]	[member duties]	[member duties]	[member duties]

Figure 1: Organizational Tree

4.0 Communications Strategy

[Briefly describe the communication strategy in a paragraph. Use the boilerplate communication matrix to summarize graphically how communication will occur.]

Communication Matrix: [project name]							
Method	Facility	Public	Project Coordinator	[TRT member]	[TRT member]	[TRT Member]	[TRT member]
[Method]							
[Method]							
[Method]							
[Method]							
[Method]							
[Method]							
[Method]							

Table 1. The Communication Matrix

5.0 Public Participation

[Describe public participation in a paragraph. Provide a table summarizing tools to be used.]

Public Participation: [project name]	
Tool	**Frequency**
[tool]	[frequency]
[tool]	[frequency]
[tool]	[frequency]

Table 2. Public Participation Schedule

6.0 Project Schedule

[Describe the anticipated project schedule. Provide a Gantt chart based on the compliance schedule in the permit or order.]

Gantt Chart: [project name]																		
Month																		
Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
[task]																		
[task]																		
[task]																		
[task]																		
[task]																		
[task]																		
[task]																		
Legend xxx planned activity --- float																		

Figure 2. Project Gantt Chart

Example of Project Management Plan

1.0 Project Information

Project Name:	IRCC-Marysville
Facility Mailing Address:	Industrial Recovery Capital Company of Ohio, L.L.C. 11911 Freedom Drive, Suite 900 Reston, VA 20190
Facility Physical Address:	Corner of Oak and Ninth Streets Union County Marysville, Ohio
Facility Contact:	Michael Murphy (999)999-9999 (999)999-9999
Project Vehicle:	Pending Consent Order
Miscellaneous:	IRCC-Marysville is the former Eljier Plumbingware facility. The site owner is IRCC of Ohio, the site consultant is Environmental Strategies Corporation(ESC). The contact at ESC is Mr. Chris Powell (999)999-9999. IRCC is performing owner/operator initiated corrective action pending issuance of a final consent order. They have submitted a single corrective action plan(CAP) which addresses RFI and CMS requirements.

2.0 Project Objectives

Ohio EPA has several general objectives for the site: 1) ensure the CAP provides for sufficient site investigation to identify all potential risks 2) ensure the CAP employs a remedy consistent with the threshold and balancing criteria in the Ohio CAP 3) recognize IRCC's time constraints for park opening 4) attain remedial expectations. More specific, short term objectives may become evident during the project. At all times the objectives of the Ohio EPA will be discussed with IRCC to increase their chance of meeting our objectives.

3.0 Organizational Structure

Project management will be accomplished by use of the technical review team approach. General corrective action plan review and field oversight will be performed by the project coordinator, Jeff Reynolds. The central office engineer responsible for landfill cover design review is Troy Kajfasz. Troy will also help with some of the site investigation review. This is limited ecological risk expertise in the district, therefore the U.S. EPA Region V (Meagan Smith) will be utilized for review of the ecological risk assessment, if available. Ms. Peggy Crone-Brown of DDAGW will review ground water sampling and hydrogeology at the site. Because this is an enforcement case, Harry Sarvis of central office enforcement will be drafting the orders. Todd Anderson of central office legal will help with the orders and draft deed restriction language.

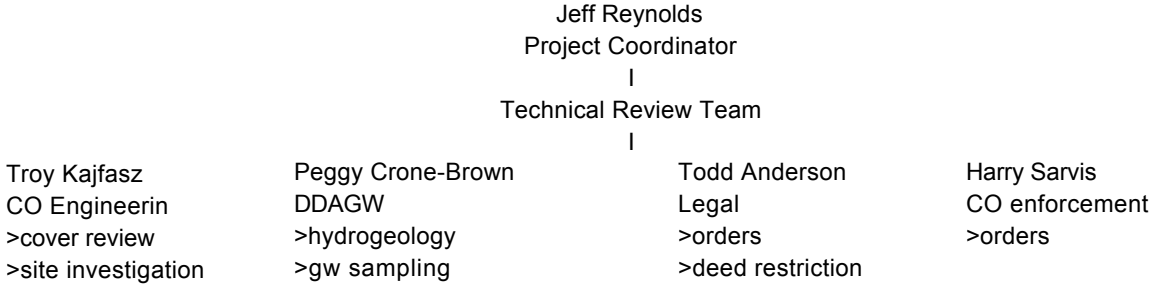

Figure 1. Organization Tree

4.0 Communications Strategy

Communcition for the project will utilize face-to-face meetings, conference calls, newsletters, public meetings, and monthly reports. A scoping meeting between the facility and the project coordinator will be held to discuss a general timeline for the project, and to convey the project objectives for both the facility and the Agency. Monthly face-to-face meetings will be held between the project coordinator, facility, and the technical review team members on the second Tuesday of every month. An agenda will be prepared and distributed by the project coordinator prior to the meeting. Conference calls will be held as needed to discuss issues between the monthly meetings. As described in the public relations plan prepared by IRCC, a quarterly newsletter will be prepared and distributed by IRCC to all the local residents and other stakeholders. A quarterly public meeting will be hosted by the agency at the site on the first Tueday of the following months: January, April, July, October. At the meeting, the project coordinator will make himself available to answer any questions the concerned public may have. Key aspects of the project will be explained at the meetings. If attendance is not sufficient to justify quarterly meetings, the schedule may be changed to semi-annually. IRCC will submit monthly progress reports, due the 15th of each month, to the project coordinator.

Communication Matrix: IRCC-Marysville

Method	Facility	Public	Project Coordinator	Todd Anderson	Harry Sarvis	Meagan Smith	Troy Kajfasz
monthly technical meeting	participates		participates	participates as needed	participates	participates as needed	participates
quarterly public meeting	participates	participates	participates				
quarterly newsletter	prepares	receives					
monthly progress report	prepares		receives				
conference calls	participates		participates	participates as needed	participates as needed	participates as needed	participates as needed

Table 1. The Communication Matrix

5.0 Public Participation

Public participation is expected to play a major role in this project. The project objective is to turn the site into a public park, and as such, the public has a direct role in it's development. Three activities are planned to incorporate public participation into the project. The first actitivity is preparation of a quarterly newsletter prepared and distributed by IRCC, as stated in their public participation plan. This newsletter will address current activities accomplished at the site, and and expected future activities. The second tool for public participation will be an agency sponsored public meeting at the site every quarter. This public meeting will be held on the second tuesday of January, April, July, and October to discuss current activities at the site and answer questions from concerned citizens. If there is insuficient interest for a quarterly public meeting, the frequency will be changed to semi-annually. The third public participation tool is a public hearing and public comment period which will be held after the agency has proposed a final remedy.

Public Participation: IRCC-Marysville	
Tool	**Frequency**
newsletter	quarterly
public meeting	quarterly
public hearing/ comment period	at remedy selection

Table 2. Public Particpation Schedule

6.0 Project Schedule

The anticipated project schedule appears in the Gantt chart below. Only major milestones are included. The only true deadline established to date is the park opening, scheduled for June 15, 1999. The other deadlines are dependant on completion of previous steps (i.e., order negotiation before submittal of completion report.

Gantt Chart: IRCC-Marysville

	Month																	
Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
IRCC prepares CAP	xx	xx	--															
OEPA reviews CAP			xx	xx	xx	--												
IRCC conducts field activities			xx	xx	xx	xx	xx	xx	--	--	--							
Final Orders are negotiated and issued						xx	xx	xx	--	--	--							
IRCC prepares and submits completion report									xx	xx	xx	--						
OEPA reviews and approves completion report												xx	xx	xx	--	--	--	
Park Opens															xx	xx	xx	xx

Legend
xxx planned activity --- float

Figure 3. Project Gantt Chart

Appendix C **June 29, 2006**
Revision 2 June 2009

DHWM GUIDANCE ON ACCOMPLISHING THE PERFORMANCE MEASURES FOR FACILITIES IN U.S. EPA'S 2020 CORRECTIVE ACTION UNIVERSE

What is the Purpose of this Guidance?

The purpose of this guidance is to provide DHWM Corrective Action project managers, their supervisors and managers with direction on how to accomplish the Corrective Action performance measures/events for 2020 Corrective Action universe (aka the GPRA 2020 Corrective Action Baseline) facilities where Ohio EPA/DHWM is the lead agency. While the 2020 Corrective Action universe facilities are DHWM's highest Corrective Action priority, the principles in this guidance apply at facilities outside of the 2020 universe performing Corrective Action work.

1. U.S. EPA's 2020 Corrective Action Universe/Lead Agency

Prior to September 30, 2005, there were 85 Ohio facilities on the national GPRA Corrective Action Baseline. U.S. EPA removed one facility from the baseline and 31 Ohio facilities were added on October 1, 2005, resulting in a total of 115 Ohio facilities being on the baseline. In 2007, an additional 142 Ohio facilities were added, bringing Ohio's 2020 universe to 257 facilities. Taking into account the transition of permitted facilities from U.S. EPA authority/oversight to Ohio EPA authority/oversight (accomplished via issuance of renewal permits and a modified permit over the last several years), and U.S. EPA/DHWM discussion and agreement, Ohio EPA/DHWM is now the lead agency at 163 of these facilities. Being the lead agency means that DHWM is responsible for directing and overseeing all necessary investigation and Corrective Action activities at each facility (for the permitted facilities that U.S. EPA transitioned to DHWM, we became responsible on the date the state permit action was journalized, unless specific language in Module E of the permit identified a different transition point). This responsibility includes all document review and approval and field oversight.

2. National Goals for Accomplishing the Corrective Action Performance Measures at Facilities in the 2020 Corrective Action Universe

U.S. EPA's overall goal for the universe of Corrective Action facilities in the country is to document remedy construction completion at 95% of all the facilities in the entire universe by the end of federal fiscal year 2020. Every three years, U.S. EPA updates its five-year strategic plan setting forth intermediate goals or milestones deemed necessary to achieve the Agency's long term 2020 goals. DHWM's and U.S. EPA's achievement of the national goals established in the strategic plan will help meet U.S. EPA's overall 2020 goal.

National goals for those same performance measures will be established by U.S. EPA for the three year time periods leading up to 2020, i.e., 2011, 2014 and 2017. Taking these national goals into account, each state develops a corresponding three year plan in which it projects the number of performance measures it will accomplish at state-lead 2020 universe facilities to achieve the national goal for the next milestone year. The three year plan is included in each state's work plan that it provides to U.S. EPA in order to earn the hazardous waste program grant dollars made available by U.S. EPA to each state on an annual basis. DHWM's current three year plan is in the FFY '09 grant work plan and can be found on Haznet. Each U.S. EPA region also projects the number of performance measures it will accomplish at federal-lead 2020 universe facilities on both an annual and three year basis. The result is the states and the regions working together to accomplish the number of performance measures necessary to meet the national goal. The performance measures for which national goals are established and the goals themselves are as follows:

Current Human Exposures Under Control Environmental Indicator (aka Human Exposures EI) - RCRAInfo Corrective Action event code CA725 - the 2011 goal is 65% of the entire 2020 universe (within this 2011 goal, 95% of the High Priority NCAPS universe must be accomplished); the 2020 goal is 95% of the entire 2020 universe by 9/30/2020

Migration of Contaminated Ground Water Under Control Environmental Indicator (aka Ground Water EI) - RCRAInfo Corrective Action event code CA750 - the 2011 goal is 55% of the entire 2020 universe (within this 2011 goal, 95% of the High Priority NCAPS universe must be accomplished); the 2020 goal is 95% of the entire 2020 universe by 9/30/2020

Remedy Construction Completion - RCRAInfo Corrective Action event code CA550 - the 2011 national goal is 32% of the entire universe (Region 5 says its goal is 26%; we'll go with the national goal); the 2020 goal is 95% of the entire 2020 universe by 9/30/2020

U.S. EPA used to track the Remedy Decision performance measure, RCRAInfo Corrective Action event code CA400, but no longer does formally as the assumption is that to get to CA550, you had to first make a remedy decision (even if that decision was that no remedy is necessary).

Whenever possible, DHWM would also like to achieve the Corrective Action Process Terminated performance measure, RCRAInfo Corrective Action event code CA 999, though it is not being tracked nationally. This event code differs from RCRAInfo Corrective Action event code CA 900, which means that Corrective Action standards were successfully attained as a result of corrective measures being required, with or without controls, but that the Corrective Action process in its entirety is not yet officially terminated by the regulatory agency.

3. Environmental Indicators (EI) - General Information

(Most of the information that follows is found on U.S. EPA's web site on Corrective Action environmental indicators under the frequently asked questions section www.epa.gov/epawaste/hazard/correctiveaction/eis/faqs.htm*.)*

The Human Exposures EI and the Ground Water EI provide a means of evaluating and reporting on current facility conditions. They are used to summarize and report on the facility-wide conditions at GPRA Corrective Action 2020 universe/baseline facilities though they can also be used at non-2020 universe facilities. They are a snapshot reflecting current conditions at a facility including current land use and pathways of exposure. They do not address whether Corrective Action is complete, whether remedial long term goals are met or whether a facility will be protective of human health and the environment if land use changes in the future. A positive EI determination is not a "final" cleanup decision at a facility. It is possible that a facility meeting both EIs may not need any or further cleanup/Corrective Action (beyond what may have been done under the closure rules, for example). However, it is also possible that a facility meeting both EIs needs substantial work before a cleanup can be considered complete. In some cases, the completion of an interim measure may eliminate current exposures, and justify a positive EI determination, but a more permanent remedy may be needed to ensure that a facility is protective of human health and the environment for reasonably anticipated future uses that are different from the current industrial use.

It is the responsibility of the DHWM project manager/inspector for the subject facility, in conjunction with his/her supervisor, to make the EI determination. The project manager is encouraged to complete the EI form as soon as he/she is assigned to a particular facility. Even if the initial EI determination is "No" or "Insufficient Information," completion of the form should identify any information gaps that need to be filled, likely through investigative work performed by the facility, or a potential interim measure that may be needed to eliminate an exposure pathway. It is acceptable for the facility or its consultant to initially complete the form and provide it to the project manager. The project manager can use that completed form as one more source of

information in fulfilling his/her responsibility to complete and sign a positive "Yes" EI determination.

4. The Positive Human Exposures EI Determination

The Human Exposures EI is a facility-wide assessment of actual current human risks (ecological risk is not evaluated) under current facility land use conditions that typically takes the form of a qualitative assessment of the completeness of exposure pathways. It may or may not include a quantitative risk assessment. The determination is made by completing the federal form provided for that purpose. The form takes you through a series of logical questions that are answered based on the information available for the facility. The form will be signed by the project manager as well as his/her supervisor. Each District Office should check its local protocol to determine if an ES3 should review the federal form before it is finalized. In addition to the District Office ES3s and supervisors, Central Office's Engineering and Remediation Assistance Section (ERAS) is available for assistance with the federal forms. If you and your supervisor are not sure that the completed form and accompanying rationale constitutes a positive determination, provide a draft to the ERAS manager and the assistant chief for their review and input.

Once completed and signed, the form is placed in the District Office file and a copy is sent to Central Office for a brief review, RCRAInfo data entry and filing. The copy should initially be sent to the ERAS manager. After the ERAS manager's review, he will provide it to the assistant chief, who in turn will provide it to the Regulatory and Information Services Section (RISS) along with any necessary instructions for RCRAInfo data entry. RISS will then ensure the hard copy is placed in the Central Office files. Occasionally, Region 5 will contact Central Office management to request copies of completed EI determinations in Ohio for a particular time period. Therefore, the project manager should have available a pdf file of the finalized signed federal form that he/she could e-mail DHWM's assistant chief and ERAS's manager if necessary.

A Human Exposures EI evaluation considers all environmental media at a facility along with realistic exposure pathways and scenarios. To make a positive determination, it is not necessary for the facility to complete an entire facility-wide investigation if adequately protective controls are in place to prevent unacceptable exposures for the reasonably expected worst-case scenarios in the uninvestigated areas or if the project manager determines that a facility-wide investigation is not needed at all.

Although there is no specific point/step in the Corrective Action assessment, investigation and remediation "process" that provides a definitive trigger for making a positive EI determination, the project manager should at the very latest be able to make a positive determination after a facility-wide investigation was completed if that investigation concluded there were no current unacceptable exposure scenarios at the facility based on current land use. If the investigation did determine that a current, unacceptable exposure scenario did exist, an interim measure should be required to eliminate it. The success of that interim measure, i.e., elimination of the unacceptable exposure scenario, would likely be the determining factor in making a positive EI determination. Remember that it is not necessary to wait for corrective/remedial measures to be completed before making a positive EI determination. Waiting until then implies that human exposures were not under control up until that point, raising the question as to why an interim measure was not considered to address what must have been an unacceptable exposure scenario that was allowed to remain that way until the overall remedy for the facility was selected and construction of it was completed. Also remember that a positive determination can and should be changed if facility conditions change to the extent that a positive determination is no longer appropriate.

5. The Positive Ground Water EI Determination

For the Ground Water EI, ground water must be considered on a facility-wide basis. The Ground Water EI is a resource protection measure and not a direct measure of human risk. The Ground Water EI addresses the question, from a physical perspective, of whether an existing plume of contaminated ground water is continuing to expand in the vertical or horizontal dimensions above levels of concern. The determination is made by completing the federal form provided for that purpose. If ground water is not contaminated, completing a positive EI determination is very straightforward and should take very little time. The same administrative procedures used to complete and enter into RCRAInfo a Human Exposures EI determination will be used to complete the Ground Water EI determination.

The Ground Water EI determination may include, as necessary and relevant, an assessment of the impact of contaminated ground water discharge to surface water. If the interaction exists, one must determine if the contaminated ground water is causing an unacceptable impact to the receiving surface water body. Ohio EPA's Division of Surface Water should be consulted to make this determination. A positive Ground Water EI determination is appropriate when the ground water is not significantly affecting the receiving surface water body in a way that leads it to fail basic water quality criteria.

6. Remedy Decision

Although it is possible for phased or partial remedy decisions to be made relative to specific areas of a facility or for specific waste management units (WMUs), and may even be desirable depending upon the size and status of any particular facility, the goal for this performance measure is to make a remedy decision for the entire facility. There is no federal form to be filled out to document this decision. A remedy decision occurs when Ohio EPA/DHWM decides it has the information necessary to select and impose a remedy or remedies that, once implemented, will result in the facility meeting the RCRA Corrective Action long term goal of protection of human health and the environment consistent with the use of the property.

This performance measure can also be achieved by DHWM deciding, based on either an RFI report or other available information about the facility, that a remedy is not needed because facility conditions currently demonstrate that human health and the environment are being protected. This is still a remedy decision even though a remedy is not actually necessary. RCRAInfo has a status code to represent this situation.

The way to document either type of remedy decision is described below.

7. Remedy Decisions at Permitted Facilities

The Corrective Action module of a state hazardous waste installation and operation permit, Module E, contains a summary of the Corrective Action status/progress made by the facility as of the date of the permit renewal or modification action. Based on that summary, the module requires the facility to take the next appropriate step in the Corrective Action problem solving process. Finally, the module also lists the WMUs and areas of concern at the facility that were identified by an assessment of the facility done for that purpose.

A remedy decision is typically made at one of two points: 1) after the completion of a facility-wide investigation and agency approval of a report documenting the results of the investigation; the report may describe a presumptive remedy with which DHWM agrees, thereby making a corrective measures study unnecessary, or 2) after the completion of a corrective measures study and the submittal to DHWM of a report that can be approved documenting the results of that study. It is a facility-specific decision.

When the time for making a remedy decision arrives, the project manager must develop a Statement of Basis that serves as the factual foundation for the director moving forward with a remedy decision, even if that decision is that no remedy is needed. The Statement of Basis identifies the remedies selected by Ohio EPA and explains the reasons for their selection. It also summarizes the facility history and physical setting, the results of the facility investigation, and Ohio EPA's evaluation of the alternatives proposed for remediating the facility. A general outline for a Statement of Basis as well as examples of previously issued Statements of Basis can be viewed on Haznet and used as models/guidance. Additionally, the documents necessary to move forward with a director-initiated permit modification (draft permit, fact sheet, etc.) will be prepared by the project manager. The draft permit should have terms and conditions requiring the facility to implement the remedies being proposed (e.g., submit an operation and maintenance plan within 90 days of the effective date of the modified permit). The contents of the permit modification package as well as the administrative processing procedures are provided in Section 2.5 of DHWM's Unified Permitting Manual. Once the draft permit documents and the Statement of Basis are prepared, the project manager will e-mail them to the Central Office ERAS contact for review along with the expected turnaround time. At this point, each project manager should check their District Office protocol to determine if an ES3 should review the Statement of Basis.

After all draft reviews are complete, the project manager will send the package through the district sign-off process and forward it to the ERAS contact. ERAS will send the draft permit modification package through Central Office sign-off. After the package is signed by DHWM's assistant chief, the Central Office RISS will issue the Statement and draft modified permit for a 45 day public comment period. If requested during the public comment period, Ohio EPA will hold a public hearing.

Once the comment period ends, the project manager prepares the final modified permit, along with a responsiveness summary if any public or facility comments on the remedy decision were received. As previously mentioned, the contents of the modification package as well as the administrative processing procedures are provided in Section 2.5 of DHWM's Unified Permitting Manual. The Statement of Basis does not need to be included in the final modified permit package nor is a Decision Document necessary as the final modified permit serves that purpose. The project manager sends the package through District Office sign-off and forwards it to the ERAS contact for Central Office sign-off. The date that RISS enters the final modified permit into the director's journal, i.e., issues it, is the actual date for the remedy decision. Central Office's RISS will enter the journalization date along with the CA400 Remedy Decision event code into RCRAInfo. RISS also prepares the cover letter for the permit modification package and sends it to the facility and provides public notification.

If the remedy decision requires an active remedy or only some type of operation and maintenance or monitoring, whether that monitoring is newly required or ongoing, the permit must remain in place as the vehicle for requiring that operation and maintenance or monitoring to be performed. Even if the facility has closed all its operating hazardous waste management units, and the permit is modified to reflect that, the permit becomes a RCRA Corrective Action-only permit and must stay in place. If the permit is soon to expire, the facility must seek renewal of the permit only for purpose of Corrective Action, in accordance with OAC Rule 3745-50-40(D). ERAS can provide direction on what information a facility must include in its renewal application for a Corrective Action-only permit and what modules and conditions are appropriate to include in a draft renewal permit.

8. Remedy Decisions at Facilities Conducting Corrective Action Pursuant to Director's Consensual Final Findings and Orders (orders)

For the few facilities conducting Corrective Action work pursuant to orders, the project manager must determine when there is enough information available to justify going forward with a remedy decision, unless the orders specify what must occur before that can happen. A remedy decision is

typically made at one of two points: 1) after the completion of a facility-wide investigation and agency approval of a report documenting the results of the investigation; the report may describe a presumptive remedy with which DHWM agrees, thereby making a corrective measures study unnecessary, or 2) after the completion of a corrective measures study and the submittal to DHWM of a report that can be approved documenting the results of that study. It is a facility-specific decision.

As with a permitted facility, the project manager must develop a Statement of Basis that serves as the factual basis for the director moving forward with a remedy decision. The Statement of Basis identifies the remedies proposed to be selected by Ohio EPA and explains the reasons for their proposed selection. It also summarizes the facility history and physical setting, the results of the facility investigation, and Ohio EPA's evaluation of the alternatives proposed for remediating the facility. A general outline for a Statement of Basis as well as examples of previously issued Statements of Basis can be viewed on Haznet and used as models/guidance. Once the Statement of Basis is drafted, the project manager will e-mail it to ERAS's manager for review along with the expected turnaround time. Additionally, each project manager should check their District Office protocol to determine if an ES3 should review the Statement of Basis. After all draft reviews are complete, the project manager will send the Statement of Basis through the district sign-off process and forward it to ERAS. ERAS will send the Statement of Basis through Central Office sign-off. After the Statement of Basis is signed off on by DHWM's assistant chief, RISS will issue the Statement for a 45 day public comment period. If requested during the public comment period, Ohio EPA will hold a public hearing.

Once the comment period ends, a final Decision Document, which includes a statement of declaration as the cover page, a briefing memo addressed to the director, and a responsiveness summary, if public comments were received, must be prepared for the director's signature. However, prior to drafting the Decision Document, the project manager's supervisor should ask the DHWM legal supervisor to assign an attorney, if one is not already assigned, to provide legal support and to determine when the existing orders are appropriate to be terminated. Consultations between the attorney, ERAS and the district should occur at this point to determine the necessity of drafting orders that would compel the facility to implement the selected remedy (in most cases, orders will be necessary). If the decision is made to proceed with drafting implementation orders, ERAS will take the lead in drafting the orders with input from the district project manager and the assigned attorney. While the orders are being drafted, the project manager will prepare the Decision Document, the director's briefing memo, and responsiveness summary, if required.

A general outline for a Decision Document, an example of one that has been issued, and a director's briefing memo boilerplate can be viewed on Haznet and used as models/guidance. Once the Decision Document is drafted, the project manager will e-mail it to ERAS's manager for review and comment. Additionally, each project manager should check their District Office protocol to determine if an ES3 should review the Decision Document. After all draft reviews are complete, the project manager will send the Decision Document through the district sign-off process and forward it to ERAS for Central Office sign-off. The date that RISS enters the Decision Document into the director's journal is the actual date for the remedy decision. RISS will enter the journalization date along with the CA400 Remedy Decision event code into RCRAInfo. RISS also prepares the cover letter for the Decision Document and sends it to the facility and provides public notification.

At the time of the Decision Document issuance, a draft set of orders should be ready for negotiation with the facility. The assigned attorney will offer to the owner/operator's counsel the proposed implementation orders accompanied by an invitation to negotiate its terms. Once terms are agreed upon by both parties, the owner/operator will sign the orders and return them to Ohio EPA for the director's signature. ERAS will prepare the director's briefing memo and send the orders through Central Office sign-off. After the orders are signed by the director, RISS

journalizes the final orders, prepares the cover letter, sends them to the facility and provides public notification.

Except for the preparation of a new set of orders, the same procedure must be followed if the remedy decision is that no further action is needed. A Statement of Basis must be prepared and issued for public comment. A Decision Document, with a statement of declaration as the cover page, a director's briefing memo, and a responsiveness summary, if public comments were received, must then be prepared for the director's signature. A DHWM attorney should be consulted at this point to determine when the existing orders can appropriately be terminated.

9. Remedy Decisions for Facilities that Perform Corrective Action Work Informally/Voluntarily via a Collaborative Working Arrangement between the Facility and DHWM Outside of any Formal Agreement, or through a Written Facility-lead Agreement

Some facilities may proceed with the necessary facility investigation by working informally/voluntarily with DHWM either via a collaborative working arrangement between the facility and DHWM outside of any formal agreement, or through a written facility-lead agreement (which is similar to Region 5's voluntary agreement). Frequent communication, the sharing of mutual cleanup goals and a positive working relationship with a facility may result in a facility doing work and making document submittals to DHWM summarizing the work performed outside of any formal agreement. If the facility and the project manager wish to proceed in this informal manner, it should be with the understanding that, if the director decides a remedy is necessary that requires construction of engineering controls, and the subsequent operation and maintenance of those controls, or some type of monitoring, DHWM expects the facility to enter into agreed-upon orders requiring the facility to perform that operation and maintenance or monitoring subsequent to issuance of the Decision Document. Any exception to this expectation will be determined on a fact/facility-specific basis. There is always the risk that in working with a facility on an informal basis outside of any written agreement, the facility may at some point decide that it no longer wants to do more work or do the work that DHWM believes is necessary. District management and staff are in the best position to determine how much of a risk it is to work with a facility in this manner, as staff resources are limited, DHWM does not have unilateral Corrective Action order issuance authority and there are many facilities that need to perform Corrective Action work.

Should a facility proceed in this manner, DHWM must review and approve a facility submittal, i.e., the RFI report that may or may not be combined with a Corrective Measures Study report, that documents a facility's (or portion of a facility) investigation and justifies the facility's preferred remedies. The project manager can then use this facility document for his/her preparation of a Statement of Basis that would be equivalent to the Statement prepared pursuant to an order or permit. The Statement must be public noticed for a 45 day public comment period. Once the public comment period ends and a responsiveness summary is prepared, if applicable, the final Decision Document can be prepared for the director's signature following the same procedure described in the previous section.

If the Decision Document selects an active remedy or a remedy that requires operation and maintenance or monitoring, the project manager should, in conjunction with an assigned attorney (the project manager's supervisor should ask the DHWM legal supervisor to assign an attorney prior to finalization of the Decision Document), develop draft consensual orders that would memorialize the facility's requirement to perform the operation and maintenance or monitoring (keep in mind that financial assurance must also be required). The terms of the orders would then be negotiated with the facility.

The RFI report or similar document submitted to DHWM by the facility may conclude that no remedy is necessary and no further action is required. If DHWM agrees with these conclusions, a Statement of Basis must be prepared and public noticed for public comment. Once the public

comment period ends and a responsiveness summary is prepared, if applicable, the final Decision Document can be prepared for the director's signature.

At the time of the most recent revision to this guidance, DHWM was working on development of a facility-lead agreement. Once this model agreement is finalized, and should a facility decide to enter into one with DHWM, making and documenting a remedy decision would follow the same procedure described in this section.

10. Remedy Decisions for Facilities Where a Facility-Wide Investigation is not Necessary, Closure was the only Remedial Work Performed and was Completed, and the Facility-wide Remedy Decision is that no Remedy is Necessary

It is possible to make a facility-wide remedy decision for Ohio EPA/DHWM-lead 2020 Corrective Action universe facilities where a facility-wide investigation is not necessary. This can occur when a unit-based investigation was performed and remediation was completed and certified through the closure process, and facility-wide investigation in the Corrective Action context is not necessary either because there is no evidence of a release from the other WMUs or areas of concern, or there simply were no other WMUs or areas of concern. The scenario is based on the facts specific to that facility and is described below.

There are circumstances with DHWM-lead facilities that result in DHWM's belief that, even though a facility is a federal Corrective Action priority because it's in the 2020 universe, a RCRA Facility Investigation and subsequent corrective measures are not necessary. Examples of such facilities include those added to the 2020 universe because they were on U.S. EPA's 2006 permitting baseline, and therefore had a Corrective Action obligation, or were designated a high priority by U.S. EPA under U.S. EPA's outdated National Corrective Action Prioritization System (NCAPS), with the up-front determination that they had a Corrective Action obligation.

In both of these facility examples, the situation is often the same. The facility had at least one unpermitted hazardous waste management unit discovered by a DHWM inspector during a compliance evaluation inspection. The facility chose to close the unpermitted unit instead of seeking a permit for it. Closure was subsequently performed pursuant to an approved closure plan and the closure certification was accepted by DHWM. There are either no other WMUs or areas of concern at the facility or, if there were, there is no evidence of a release of hazardous waste or constituents from any of them. This information is typically present in the facility file. The file may contain a Preliminary Assessment/Visual Site Inspection (PA/VSI) Report performed in the late 1980s or early 1990s by a U.S. EPA contractor or, in some situations, by Ohio EPA, if one was performed. The DHWM project manager should combine this information with any other Ohio EPA file information that exists about additional facility units/areas. A facility visit should be performed (if one has not occurred relatively recently) to verify the file information and to determine if any other units/areas exist. If the facility visit, PA/VSI Report and any other file information result in the project manager drawing the conclusion that facility-wide investigation is not necessary, the project manager should proceed to document a remedy decision as follows.

The remedy decision in these cases must focus on the fact that closure was completed successfully and either there were no other WMUs or areas of concern or that the WMUs and areas of concern that do exist show no evidence of a release to the environment. This scenario can be documented in a Corrective Action completion summary report that will be dated and placed in the facility's file (and may be attached to a Corrective Action complete letter signed by the division chief if the district concludes the facility has fulfilled its Corrective Action obligations). The two key components of the Corrective Action completion summary document are the history of closure activities (and post-closure, if applicable) and the discussion of why a facility investigation is not necessary.

Providing a draft of the document to ERAS and the assistant chief for review and comment prior to finalization is recommended. A copy of the final Corrective Action completion summary document must be provided to the assistant chief and/or the ERAS manager. Once received from either ERAS or the assistant chief, RISS will enter the CA400 Remedy Decision event code, the CA070No RFI is not Necessary event code and the CA550NR No Remedy Constructed event code (see next section) into RCRAInfo.

11. Remedy Construction Completion

Remedy construction completion is the event/performance measure where DHWM acknowledges in writing that a facility has completed construction of a remedy/remedies designed to achieve long term protection of human health and the environment and that the remedy is fully functional as designed, whether or not final cleanup levels or other requirements were achieved. Remedy construction completion may also be documented where the only remedy was execution and proper recording of one or more environmental covenants (documentation provided by the facility that the covenant was filed properly will suffice for the required written documentation). In addition, remedy construction completion may be documented where a remedy was not constructed because one was not needed. The goal for this performance measure is to be able to document that remedy construction is complete across the entire facility, though phased or partial remedies can be completed and documented for specific areas of a facility. There is no federal form to fill out to document a remedy construction completion decision but some type of written documentation is necessary.

For facilities where a facility-wide investigation is not necessary and closure was completed and certified, remedy construction completion can be documented through finalization of the Corrective Action completion summary report described in Section 10. Providing a draft of the Corrective Action completion summary report to ERAS and the assistant chief for review and comment prior to finalization is recommended. A copy of the final completion report must be provided to ERAS and the assistant chief.

For facilities that implemented a remedy informally/voluntarily, through a facility-lead agreement or pursuant to an order or permit, the project manager, who is familiar with the remedy, will know either through receipt and acknowledgment of written documentation submitted by the facility, or field observation, or a combination of both, when construction of the remedy is complete and the remedy is operational, if applicable. If the permit or order did not explicitly require the submittal of a report documenting that construction of the remedy is complete, the project manager should work with the facility to provide that written documentation. If signing and filing an environmental covenant was the only remedy, the project manager's receipt of verification, in the form of a copy of the properly filed covenant, will serve as documentation that the remedy was completed. When the project manager has the evidence necessary to document remedy construction completion, the project manager must draft a letter for the District Section Manager's signature using the boilerplate letter (i.e., "Report Approval") provided for that purpose on Haznet. Note that the boilerplate letter will need to be modified if the facility did not submit a report documenting the remedy construction completion. The final dated letter to the facility will serve as documentation that this performance measure was achieved. Upon receipt of the signed letter at Central Office, RISS will enter the CA550 Remedy Construction event code into RCRAInfo.

In the permit context, if the remedy decision is that no remedy/further action is necessary, issuance of the final modified permit making that determination serves as documentation of both the remedy decision and remedy construction completion. In the order, facility-lead agreement or voluntary/informal context, issuance of the Decision Document that says no remedy/further action is necessary serves as documentation of both the remedy decision and remedy construction completion.

12. Environmental Indicator Determinations, Remedy Decisions and Remedy Construction Completion Determinations at Facilities that Utilize Ohio EPA's Voluntary Action Program.

Some facilities will proceed with a necessary facility-wide investigation by availing themselves of Ohio EPA's Voluntary Action Program (VAP) for eligible portions of the facility. Without specifying a preference for either VAP program ("classic" VAP or VAP Memorandum of Agreement [MOA] Track), the project manager should inform the facility that the VAP MOA Track Program, if completed by the facility resulting in the issuance of a covenant not to sue, is recognized by U.S. EPA as a program equivalent to state or federal RCRA Corrective Action. Completion of the classic VAP program will not receive that recognition from U.S. EPA. Should a facility choose to enter either track of the VAP, the facility's investigation and remediation activities will be subject to the VAP rules and statute, and will be monitored by VAP staff. Please note that should a facility choose to enter either track of the VAP, DHWM must still make positive environmental indicator determinations and document that a remedy decision was made and construction of the remedy completed, as applicable. Such determinations are most likely ripe to be made and documented once the facility (volunteer) is granted a covenant not to sue, the foundation of which is the No Further Action letter/package submitted by the volunteer to Ohio EPA under the VAP rules. Communication with DERR/VAP on a regular basis will lead to the necessary information being obtained. The project manager should copy the ERAS manager and/or the assistant chief on all final documentation of positive environmental indicator determinations to ensure the appropriate event codes are entered into RCRAInfo. If there are questions about how to document environmental indicators, remedy decisions or remedy construction completion for facilities that proceed through the VAP, the ERAS manager and/or the assistant chief should be consulted.

Appendix D

Nationally Defined Values for Corrective Action Event Code

CA010 **RFA Initiation**

The event by which the State or EPA starts to conduct an RFA.

Nationally Required - No

Schedule Date - Date upon which a full or partial RFA is scheduled to be initiated by an agency.

Actual Date - Date upon which a full or partial RFA is initiated by an agency as indicated on the first page of standardized reporting forms within the RFA document.

CA050 **RFA Completed**

The event by which the RFA is completed.

Initiating Source - Document with results of the RFA that determine if there is a release or potential for release for the entire facility.

Nationally Required - Yes

Schedule Date - Date is scheduled to approve the result of the RFA.

Actual Date - The date upon which there is enough information to determine if there is a release or potential for release for the entire facility is so documented. If no CA processing is necessary, Event Code 070, with a Status Code NO, which indicates that CA process is terminated, should be entered after Event Code CA050-RFA Completed.

CA060 **Notice of Contamination**

Receipt by the Agency of written notification that contamination has been discovered at the RCRA facility and that the RCRA facility has notified all persons potentially impacted by the release of hazardous constituents.

Initiating Source - Facility submission.

Nationally Required - No

Scheduled Date - Projected Date of receipt by the Agency of written notification that contamination has been discovered at the RCRA facility.

Actual Date - Date of receipt by the Agency of written notification that contamination has been discovered at the RCRA facility.

CA070NO **Determination of Need for an Investigation - Investigation is Not Necessary**

This event indicates whether an investigation is necessary to analyze the extent of contamination at this facility. An investigation is usually necessary when, after the initial assessment, there is evidence or the likelihood of contamination release which poses a current or potential threat to human health and/or the environment.

A status code of NO should be entered when further investigation is not needed. "NO" may indicate that an investigation will not be needed at this site because

remediation is not necessary.

Initiating Source - Regional or State determination upon review of an initial facility assessment.

Nationally Required - No

Actual Date - Date of determination

CA070YE **Determination of Need for an Investigation - Investigation is Necessary**

This event indicates whether an investigation is necessary to analyze the extent of contamination at this facility. An investigation is usually necessary when, after the initial assessment, there is evidence or the likelihood of contamination release which poses a current or potential threat to human health and/or the environment.

A status code of YE should be entered when further investigation is necessary.

Initiating Source - Regional or State determination upon review of an initial facility assessment.

Nationally Required - No

Actual Date - Date of determination

CA075HI **CA Prioritization - Facility or Area was Assigned a High Corrective Action Priority**

This event indicates that a facility or area has been prioritized using the National Corrective Action Prioritization System (NCAPS) or an equivalent system which has been approved by EPA Headquarters. A status code for the priority of the facility or area should be entered at the same time as the prioritization complete date.

A status code of HI indicates the facility or area was assigned a high corrective action priority.

Initiating Source - The prioritization system results.

Nationally Required - Yes

Schedule Date - Date prioritization is planned to be completed.

Actual Date - Date the facility has been given a priority through the use of NCAPS.

Guidance - EPA originally intended the NCAPS ranking to be a facility level ranking, but some Regions and States have found it useful to rank areas as well. Ranking for areas within a facility is not required. The corrective action program will count a facility as High NCAPS priority if one or more areas at the facility have a High NCAPS ranking as the most current ranking. CA075, which tracks facility priority derived through NCAPS, was originally intended to track one ranking of High, Medium, or Low NCAPS priority for the entire facility. As facilities are re-ranked because of more current information, or because of some

action which changes the priority, the RCRAInfo system has the capability to reflect successive NCAPS rankings, while not allowing the original NCAPS rank to be overwritten. This can be done by entering an additional NCAPS ranking with the new ranking date. Do not overwrite or erase the original ranking or subsequent ranking entries. This will enable users to have a historical record of facility priority, and to complete trend analyses. The most recent NCAPS ranking, by date, will be used for facility level data pulls.

CA075LO **CA Prioritization - Facility or Area was Assigned a Low Corrective Action Priority**

This event indicates that a facility or area has been prioritized using the National Corrective Action Prioritization System (NCAPS) or an equivalent system which has been approved by EPA Headquarters. A status code for the priority of the facility or area should be entered at the same time as the prioritization complete date.

A status code of LO indicates the facility or area was assigned a low corrective action priority.

Initiating Source - The prioritization system results.

Nationally Required - Yes

Schedule Date - Date prioritization is planned to be completed.

Actual Date - Date the facility has been given a priority through the use of NCAPS.

Guidance - EPA originally intended the NCAPS ranking to be a facility level ranking, but some Regions and States have found it useful to rank areas as well. Ranking for areas within a facility is not required. The corrective action program will count a facility as High NCAPS priority if one or more areas at the facility have a High NCAPS ranking as the most current ranking. CA075, which tracks facility priority derived through NCAPS, was originally intended to track one ranking of High, Medium, or Low NCAPS priority for the entire facility. As facilities are re-ranked because of more current information, or because of some action which changes the priority, the RCRAInfo system has the capability to reflect successive NCAPS rankings, while not allowing the original NCAPS rank to be overwritten. This can be done by entering an additional NCAPS ranking with the new ranking date. Do not overwrite or erase the original ranking or subsequent ranking entries. This will enable users to have a historical record of facility priority, and to complete trend analyses. The most recent NCAPS ranking, by date, will be used for facility level data pulls.

CA075ME **CA Prioritization - Facility or Area was Assigned a Medium Corrective Action Priority**

This event indicates that a facility or area has been prioritized using the National Corrective Action Prioritization System (NCAPS) or an equivalent system which has been approved by EPA Headquarters. A status code for the priority of the facility or area should be entered at the same time as the prioritization complete date.

A status code of ME indicates the facility or area was assigned a medium corrective action priority.

Initiating Source - The prioritization system results.

Nationally Required - Yes

Schedule Date - Date prioritization is planned to be completed.

Actual Date - Date the facility has been given a priority through the use of NCAPS.

Guidance - EPA originally intended the NCAPS ranking to be a facility level ranking, but some Regions and States have found it useful to rank areas as well. Ranking for areas within a facility is not required. The corrective action program will count a facility as High NCAPS priority if one or more areas at the facility have a High NCAPS ranking as the most current ranking. CA075, which tracks facility priority derived through NCAPS, was originally intended to track one ranking of High, Medium, or Low NCAPS priority for the entire facility. As facilities are re-ranked because of more current information, or because of some action which changes the priority, the RCRAInfo system has the capability to reflect successive NCAPS rankings, while not allowing the original NCAPS rank to be overwritten. This can be done by entering an additional NCAPS ranking with the new ranking date. Do not overwrite or erase the original ranking or subsequent ranking entries. This will enable users to have a historical record of facility priority, and to complete trend analyses. The most recent NCAPS ranking, by date, will be used for facility level data pulls.

CA100 Investigation Imposition

The event by which the State or EPA imposes an obligation upon the owner/operator of a facility regulated by RCRA or the equivalent state law to conduct an investigation into the nature and extent of contamination at a facility.

Initiating Source - Written notification by the State or EPA that an investigation is required.

Nationally Required - Yes

Schedule Date - Date the State or EPA is expected to issue the enforcement order, permit or permit modification, voluntary instrument, or other written document.

Actual Date - Date the State or EPA issues the enforcement order, permit or permit modification, voluntary instrument, or other written document.

CA110 Investigation Workplan Received

The event by which a RCRA facility submits an investigation workplan to the State or EPA.

Initiating Source - Facility submission.

Nationally Required - No

Schedule Date - Due date is date in permit or order condition.

Actual Date - Date investigation workplan is received by the State or U.S. EPA.

CA120 Investigation Workplan Modification Requested by Agency

The event by which the State or EPA requests that the RCRA facility modify its investigation workplan.

Initiating Source - Letter from the State or U.S. EPA to the facility.

Nationally Required - No

Schedule Date - Projected date of letter

Actual Date - Date of letter

CA140 Investigation Workplan Notice of Deficiency Issued

The event by which the State or EPA issues a Notice of Deficiency to the Handler citing deficiencies in the proposed investigation workplan.

Initiating Source - Notice of Deficiency from the EPA or State to the facility.

Nationally Required - No

Schedule Date - Date N.O.D. is scheduled to be sent to handler.

Actual Date - Date of N.O.D.

CA150 Investigation Workplan Approved

The event by which the State or EPA approves the investigation workplan submitted by the RCRA facility.

Initiating Source - Approval by the State or EPA of the investigation plan prepared by a facility in response to an order, permit, or permit modification with a schedule of compliance imposing an investigation obligation upon the facility.

Nationally Required - No

Schedule Date - Date the approval is expected.

Actual Date - Date of the approval.

CA155 Investigation Supplemental Information Requested by Agency

The event by which the State or EPA requests information from the RCRA facility to modify, expand, amend, reexamine, or otherwise revisit the Workplan which had previously been approved but the report generated is not yet sufficient.

Nationally Required - No

CA160 Investigation Supplemental Information Received

The event by which the RCRA facility submits supplemental investigation information.

Initiating Source - Facility submission.

Nationally Required - No

Schedule Date - Due date is date in permit or order condition, permit or order modification, or letter from State or U.S. EPA requesting supplemental information.

Actual Date - Date investigation supplemental information is received by the State or U.S. EPA.

CA170 Investigation Supplemental Information Deemed Satisfactory

The event by which the State or EPA formally approves the investigation supplemental information.

Initiating Source - Letter from State or U.S. EPA approving the investigation supplemental information prepared by the facility.

Nationally Required - No

Schedule Date - Date the approval is expected.

Actual Date - Date the approval is granted.

CA180 Investigation Implementation Begun

The event by which the RCRA facility committed to begin any implementation in its Agency approved investigation workplan.

Initiating Source - Notification to State or U.S. EPA by facility, or on-site observation by State or U.S. EPA.

Nationally Required - No

Schedule Date - Date in order or permit condition, or date facility is expected to begin implementation.

Actual Date - Date of notification or observation.

CA190 Investigation Report Received

The event by which a RCRA facility submits a written summary of the results of the approved investigation workplan.

Initiating Source - Report

Nationally Required - No

Schedule Date - Date in permit or order condition, or date facility is expected to submit report.

Actual Date - Date report is received by State or U.S. EPA.

CA195 Investigation Progress Reports Received

Receipt of reports submitted by the RCRA facility to the State or EPA during execution of the approved investigation workplan.

Initiating Source - Report

Nationally Required - No

Schedule Date - Date in permit or order conditions.

Actual Date - Date reports are received by State or U.S. EPA.

CA200 **Investigation Complete**

The event by which the State or EPA determines that the facility investigation is sufficient to support either a "No Further Action" determination or a Remedy Decision.

Initiating Source - Written notification from the State or EPA notifying the facility of the determination.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to issue the determination.

Actual Date - Date the State or EPA issues the determination.

CA210OT **CA Responsibility Referred to a Non-RCRA Authority - CA Referred to Another Non-RCRA Authority**

The facility or area has been referred to CERCLA or some other non-RCRA authority. This does not imply that the RCRA program would lack the authority to go back to a RCRA facility that had been addressed under CERCLA or other non-RCRA authority. It means that, as a matter of program policy, once a facility is referred to CERCLA or other non-RCRA authority, we would not actively monitor the progress of the facility and would not expect the facility to "return" to RCRA, barring some unforeseen event.

A status code of OT should be entered when corrective action is referred to another non-RCRA Authority.

Nationally Required - Yes

Actual Date - Date the Agency determines that corrective action at the facility or area has been referred to CERCLA or some other non-RCRA authority.

Guidance - The national RCRA CA program does not expect to continue keeping track of the remedial events that have been completed once a facility has been referred to Superfund. That is not to say that the RCRA program would lack the authority to go back to a RCRA facility that had been addressed under CERCLA and request additional work. However, as a matter of program policy, once a facility is referred to CERCLA, we would not actively monitor the progress of the facility and would not expect the facility to "return" to RCRA, barring some unforeseen event. This event should not be used for facilities that are only receiving an initial assessment from the Superfund program, and are expected to return to the RCRA program for the facility investigation and facility remediation steps. However, if a RCRA facility, such as one that has converted to less then 90-day storage, has, as a matter of national policy, been deferred to the Superfund program and if, in the case specific circumstance, the Region or authorized state has clearly transferred this facility to the Superfund queue, then the "Referred to a Non-RCRA AAuthority" event could be entered for this facility. Note: Regions and States are responsible for cleaning up old CA210 data. All reports for CA210 must use the status codes to insure that the correct information is pulled for the current definition of CA210.

Nationally Defined Values for Corrective Action Event Code

CA210SF **CA Responsibility Referred to a Non-RCRA Authority - CA Referred to CERCLA**

The facility or area has been referred to CERCLA or some other non-RCRA authority. This does not imply that the RCRA program would lack the authority to go back to a RCRA facility that had been addressed under CERCLA or other non-RCRA authority. It means that, as a matter of program policy, once a facility is referred to CERCLA or other non-RCRA authority, we would not actively monitor the progress of the facility and would not expect the facility to "return" to RCRA, barring some unforeseen event.

A status code of SF should be entered when corrective action at the facility or area is referred to CERCLA.

Nationally Required - Yes

Actual Date - Date the Agency determines that corrective action at the facility or area has been referred to CERCLA or some other non-RCRA authority.

Guidance - The national RCRA CA program does not expect to continue keeping track of the remedial events that have been completed once a facility has been referred to Superfund. That is not to say that the RCRA program would lack the authority to go back to a RCRA facility that had been addressed under CERCLA and request additional work. However, as a matter of program policy, once a facility is referred to CERCLA, we would not actively monitor the progress of the facility and would not expect the facility to "return" to RCRA, barring some unforeseen event. This event should not be used for facilities that are only receiving an initial assessment from the Superfund program, and are expected to return to the RCRA program for the facility investigation and facility remediation steps. However, if a RCRA facility, such as one that has converted to less then 90-day storage, has, as a matter of national policy, been deferred to the Superfund program and if, in the case specific circumstance, the Region or authorized state has clearly transferred this facility to the Superfund queue, then the "Referred to a Non-RCRA AAuthority" event could be entered for this facility. Note: Regions and States are responsible for cleaning up old CA210 data. All reports for CA210 must use the status codes to insure that the correct information is pulled for the current definition of CA210.

CA225IN **Stabilization Measures Evaluation - Facility is not Amenable to Stabilization Activity (Lack of Data)**

This event indicates that the feasibility and appropriateness of stabilization activities at this facility have been evaluated. This evaluation should be completed using the National Corrective Action Stabilization Questionnaire or a similar type of evaluation which asks the same range of questions. A status code should be entered for the areas covered by each evaluation. The status codes are consistent with the possible outcomes from the National Corrective Action Stabilization Questionnaire.

A status code of IN should be entered if the facility is not amenable to stabilization activity because of a lack of technical data. An evaluation has been completed, but further data is necessary to determine stabilization measures, feasibility or appropriateness. This status should be changed when data becomes available.

Initiating Source - The completed National Corrective Action Stabilization Questionnaire or similar review.

Nationally Required - No

Schedule Date - Date facility is expected to be evaluated for stabilization measure.

Actual Date - The date the completed National Corrective Action Stabilization Questionnaire or documentation of a similar review is entered into the facility file.

Guidance - Stabilizations can be entered for the entire facility, or for certain areas at the facility.

CA225NF **Stabilization Measures Evaluation - Facility is not Amenable to Stabilization Activity at this Time**

This event indicates that the feasibility and appropriateness of stabilization activities at this facility have been evaluated. This evaluation should be completed using the National Corrective Action Stabilization Questionnaire or a similar type of evaluation which asks the same range of questions. A status code should be entered for the areas covered by each evaluation. The status codes are consistent with the possible outcomes from the National Corrective Action Stabilization Questionnaire.

A status code of NF should be entered if the facility is not amenable to stabilization activity at the present time, because it appears to be technically infeasible or inappropriate.

Initiating Source - The completed National Corrective Action Stabilization Questionnaire or similar review.

Nationally Required - No

Schedule Date - Date facility is expected to be evaluated for stabilization measure.

Actual Date - The date the completed National Corrective Action Stabilization Questionnaire or documentation of a similar review is entered into the facility file.

Guidance - Stabilizations can be entered for the entire facility, or for certain areas at the facility.

CA225NR **Stabilization Measures Evaluation - Facility is not Amenable to Stabilization Activity (Other Reason)**

This event indicates that the feasibility and appropriateness of stabilization activities at this facility have been evaluated. This evaluation should be completed using the National Corrective Action Stabilization Questionnaire or a similar type of evaluation which asks the same range of questions. A status code should be entered for the areas covered by each evaluation. The status codes are consistent with the possible outcomes from the National Corrective Action Stabilization Questionnaire.

A status code of NR should be entered if the facility is not amenable to stabilization activity at the present time for reasons other than 1) it appears to be technically infeasible or inappropriate (NF) or 2) there is a lack of technical information (IN). Reasons for this conclusion may be the status of closure at the facility, the degree of risk, timing considerations, the status of corrective action work at the facility, or other administrative considerations.

Initiating Source - The completed National Corrective Action Stabilization Questionnaire or similar review.

Nationally Required - No

Schedule Date - Date facility is expected to be evaluated for stabilization measure.

Actual Date - The date the completed National Corrective Action Stabilization Questionnaire or documentation of a similar review is entered into the facility file.

Guidance - Stabilizations can be entered for the entire facility, or for certain areas at the facility.

CA225YE **Stabilization Measures Evaluation - Facility is Amenable to Stabilization Activity**

This event indicates that the feasibility and appropriateness of stabilization activities at this facility have been evaluated. This evaluation should be completed using the National Corrective Action Stabilization Questionnaire or a similar type of evaluation which asks the same range of questions. A status code should be entered for the areas covered by each evaluation. The status codes are consistent with the possible outcomes from the National Corrective Action Stabilization Questionnaire.

A status code of YE should be entered if the facility is amenable to stabilization activity based on the status of corrective action work at the facility, technical factors, the degree of risk, timing considerations, and administrative considerations.

Initiating Source - The completed National Corrective Action Stabilization Questionnaire or similar review.

Nationally Required - No

Schedule Date - Date facility is expected to be evaluated for stabilization measure.

Actual Date - The date the completed National Corrective Action Stabilization Questionnaire or documentation of a similar review is entered into the facility file.

Guidance - Stabilizations can be entered for the entire facility, or for certain areas at the facility.

CA250 **CMS Imposition**

The event by which the State or EPA formally imposes the obligation upon a RCRA facility to perform a Corrective Measures Study (CMS).

Initiating Source - Compliance Schedule or permit schedule of compliance.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to impose the CMS requirement.

Actual Date - Date the State or EPA imposes the CMS requirement.

CA260 **CMS Workplan Received**

The event by which a RCRA facility submits a CMS workplan to the State or EPA.

Initiating Source - Facility submission.

Nationally Required - No

Schedule Date - Due date in permit or order condition.

Actual Date - Date CMS workplan is received by the State or U.S. EPA.

CA270 **CMS Workplan Modification Requested by Agency**

The event by which the State or EPA requests that the RCRA facility modify its CMS workplan.

Initiating Source - Letter from the State or U.S. EPA.

Nationally Required - No

Actual Date - Date of letter.

CA300 **CMS Workplan Approved**

The event by which the State or EPA approves the CMS plan submitted by the RCRA facility.

Initiating Source - State or EPA approval of the CMS.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to approve the work plan.

Actual Date - Date the State or EPA approves the work plan.

CA305 **CMS Supplemental Information Requested by Agency**

The event by which the State or EPA requests the RCRA facility to modify, amend, revisit, reexamine, or re-conduct its approved CMS.

Nationally Required - No

CA310 **CMS Supplemental Information Received**

The event by which the RCRA facility submits an amendment, modification, clarification, or other supplemental information regarding the CMS.

Initiating Source - Facility submission.

Nationally Required - No

CA320 **CMS Supplemental Information Deemed Satisfactory**

The event by which the State or EPA approves the CMS supplemental information.

Initiating Source - State or U.S. EPA approval of the CMS supplemental information.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to approve the CMS supplemental information.

Actual Date - Date the State or EPA approves the CMS supplemental information.

CA330 **CMS Implementation Begun**

The event by which a RCRA facility committed to any implementation in its agency approved CMS Workplan.

Initiating Source - Notification to the State or EPA by the facility or on-site observation by State or U.S. EPA.

Nationally Required - No

Schedule Date - Date facility is expected to begin implementation.

Actual Date - Date facility begins implementation.

CA340 **CMS Report Received**

The event by which a RCRA facility submits a written summary of the results of the approved CMS workplan.

Initiating Source - Report

Nationally Required - No

Schedule Date - Date in permit or order condition, or date facility is expected to submit report.

Actual Date - Date report is received by State or U.S. EPA.

CA345 **CMS Progress Reports Received**

Receipt of reports submitted by the RCRA facility to State or EPA during execution of the approved CMS workplan.

Initiating Source - Report

Nationally Required - No

Schedule Date - Date in permit or order conditions.

Actual Date - Dates reports are received by State or U.S. EPA.

CA350 **CMS Complete**

The event by which the State or EPA determines the CMS to be sufficient to support a Remedy Decision.

Initiating Source - Written notification from the State or EPA notifying the facility of the determination.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to make the determination.

Actual Date - Date the State or EPA makes the determination.

CA370 Petition For No Further Action Receipt Date

Receipt by the Agency of a permit modification requested by the RCRA facility to eliminate any remaining corrective action steps which are included as conditions in the RCRA facility's permit.

Nationally Required - No

CA375 Interim Decision for No Further Action

The event by which the State or EPA makes an initial determination that no further action for a facility or an area within the facility is necessary. A formal "No Further Action" determination is part of a Remedy Decision indicated by CA400.

Nationally Required - No

Schedule Date - Date the determination is expected to be made by the State or EPA.

Actual Date - Date the determination is made by the State or EPA.

CA380 Date For Public Notice On Proposed Remedy

The event by which the State or EPA provides notice to the public that a proposed remedy has been tentatively selected for a RCRA facility.

Nationally Required - No

Schedule Date - Date the public comment period is expected to begin.

Actual Date - Date the public comment period begins.

CA400 Remedy Decision

The event by which the State or EPA formally selects a remedy designed to meet RCRA Corrective Action long-term goals of protection of human health and the environment. This event code also applies when no further corrective action is required because stabilization measure(s) have already been implemented or because the site characterization has demonstrated the attainment of the long-term RCRA Corrective Action goals.

When a site-wide remedy decision has been made, Remedy Decision must be link to the "Entire Facility." Phased or partial remedies, or other remedy decisions pertaining only to specific areas of the facility are to be linked only to the specific areas of implementation and not to the "Entire Facility".

Initiating Sources - A Remedy Decision and Response to Comments or other appropriate decision document that provides a description of the remedy. May be associated with a permit, administrative order or other agreement (including modification of existing instruments) to implement a final remedy.

Nationally Required - Yes

Schedule Date - The date the State or EPA decision maker is expected to sign the Remedy Decision and Response to Comments or other appropriate document.

Actual Date - The date that the EPA or State decision maker signs the Remedy Decision and Response to Comments or other appropriate document.

CA450 Corrective Measures Design Approved

The event by which the State or EPA formally notifies the RCRA facility that the design of the corrective measure is acceptable.

Nationally Required - Yes

Schedule Date - Date the Director is expected to sign approval of the corrective measures design.

Actual Date - Date the permit, permit modification or enforcement order containing the corrective measures design is issued or the date the Director signs a letter to the facility owner/operator approving the corrective measures design prepared in response to schedule of compliance in a permit, permit modification or enforcement order.

CA500 CMI Workplan Approved

The event by which the State or EPA approves the Corrective Measure Implementation Plan.

Nationally Required - No

Schedule Date - Date the State or EPA expects to approve the plan.

Actual Date - Date the State or EPA approves the plan.

CA510 Determination of Technical Impracticability

The event by which the State or EPA formally notifies the RCRA facility that the selected remedy cannot be accomplished because it is technically impracticable.

Nationally Required - No

CA550NR Remedy Construction - No Remedy Constructed

The event when the State of EPA acknowledges in writing that the RCRA facility has completed construction of a facility's remedy that was designed to achieve long-term protection of human health and the environment and that the remedy is fully functional as designed, whether or not final cleanup levels or other requirements have been achieved. Remedy construction may also acknowledge the event where no remedy is constructed.

This event code applies when 1) construction of the remedy(ies) have been completed or 2) the Remedy Decision and Response to Comments or other appropriate decision document indicates that no physical construction of a remedy has been needed since site characterization activities began or no construction is necessary beyond what has been implemented prior to the remedy decision as in the case of stabilization measures.

Remedy Construction for comprehensive remedies that address the entire facility (including off-site migration of contaminants) must be linked to the "Entire

Facility" area. Phased or partial remedies are to be attached to specific area of implementation and not to the "Entire Facility" area.

The status code NR - No Remedy Constructed applies on the actual date of the CA400-Remedy Decision if no physical construction of a remedy has been needed since site characterization activities began.

Initiating Source - 1) State or EPA document(s) (e.g. letter to facility, memorandum to file, etc.) acknowledging the completed construction of the final remedy in accordance with the requirements of permits, administrative orders, other agreements (including modification of existing instruments), or voluntary facility submissions containing equivalent information; or 2) a Remedy Decision and Response to Comments or other appropriate decision document indicating that no further physical construction of a remedy is needed.

Nationally Required - Yes

Scheduled Date - 1) The date the State or EPA is expected to acknowledge, in writing, that any necessary physical construction of the last corrective measure is complete and all remedial systems are fully functional as designed, whether or not final cleanup levels or other requirements have been achieved, or 2) the scheduled date for the remedy decision if no further physical construction of a remedy is expected to be needed.

Actual Date - 1) The date the State or EPA acknowledges, in writing, that any necessary physical construction of the last corrective measure is complete and all remedial systems are fully functional as designed, whether or not final cleanup levels or other requirements have been achieved, or 2) the date for the remedy decision if no further physical construction of a remedy is needed.

Guidance - 1) The Remedy Construction measure is an important milestone of Corrective Action progress designed to measure the progress of remedy implementation. The measure Completion with Controls or Completion Without Controls (CA900 and CA999) will likely be used to indicate the true status of completion at RCRA Corrective Action facilities, or 2) Stabilization measures implemented prior to the Remedy Decision should be recorded under CA600 and CA650.

CA550RC Remedy Construction - Remedy Constructed

The event when the State of EPA acknowledges in writing that the RCRA facility has completed construction of a facility's remedy that was designed to achieve long-term protection of human health and the environment and that the remedy is fully functional as designed, whether or not final cleanup levels or other requirements have been achieved. Remedy construction may also acknowledge the event where no remedy is constructed.

This event code applies when 1) construction of the remedy(ies) have been completed or 2) the Remedy Decision and Response to Comments or other appropriate decision document indicates that no physical construction of a remedy has been needed since site characterization activities began or no construction is necessary beyond what has been implemented prior to the remedy decision as in the case of stabilization measures.

Remedy Construction for comprehensive remedies that address the entire facility (including off-site migration of contaminants) must be linked to the "Entire Facility" area. Phased or partial remedies are to be attached to specific area of implementation and not to the "Entire Facility" area.

The status code RC (Remedy Constructed) applies after the actual date of the CA400-Remedy Decision when either: 1) all necessary physical construction of the last corrective measure has been completed and all remedial systems are fully functional as designed, whether or not final cleanup levels or other

requirements have been achieved, or 2) if all necessary physical construction of all remedial systems is fully functional as designed as a result of stabilization measures implemented prior to the actual date of the CA400-Remedy Decision whether or not final cleanup levels or other requirements have been achieved.

Initiating Source - 1) State or EPA document(s) (e.g. letter to facility, memorandum to file, etc.) acknowledging the completed construction of the final remedy in accordance with the requirements of permits, administrative orders, other agreements (including modification of existing instruments), or voluntary facility submissions containing equivalent information; or 2) a Remedy Decision and Response to Comments or other appropriate decision document indicating that no further physical construction of a remedy is needed.

Nationally Required - Yes

Scheduled Date - 1) The date the State or EPA is expected to acknowledge, in writing, that any necessary physical construction of the last corrective measure is complete and all remedial systems are fully functional as designed, whether or not final cleanup levels or other requirements have been achieved, or 2) the scheduled date for the remedy decision if no further physical construction of a remedy is expected to be needed.

Actual Date - 1) The date the State or EPA acknowledges, in writing, that any necessary physical construction of the last corrective measure is complete and all remedial systems are fully functional as designed, whether or not final cleanup levels or other requirements have been achieved, or 2) the date for the remedy decision if no further physical construction of a remedy is needed.

Guidance - 1) The Remedy Construction measure is an important milestone of Corrective Action progress designed to measure the progress of remedy implementation. The measure Completion with Controls or Completion Without Controls (CA900 and CA999) will likely be used to indicate the true status of completion at RCRA Corrective Action facilities.

2) Stabilization measures implemented prior to the Remedy Decision should be recorded under CA600 and CA650.

CA600 Stabilization Measures Decision

EPA's or the State's notification or written acknowledgement to the RCRA facility that a stabilization activity or activities are required or otherwise being undertaken. The notification mechanism could be an enforcement order, order modification, permit, or permit modification or similar enforceable state authority requiring the facility to undertake stabilization activity; it may also take the form of a written acknowledgement from EPA or the State that stabilization activity is being undertaken. The notification or acknowledgement must contain written stabilization objectives, goals, performance standards, or desired results. The stabilization activity must control or abate threats to human health and/or the environment from releases, and/or prevent or minimize the further spread of contamination. Facility initiated stabilizations/interim measures shall also be tracked with this event code.

Initiating Source: Enforcement order, order modification, permit, permit modification, similar enforceable state authority requiring the facility to undertake stabilization activity, or written acknowledgement from the State or EPA that stabilization activity is being undertaken.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to sign the final order, order modification, permit, permit modification, or written acknowledgement.

Actual Date - Date the State or EPA signs the final order, order modification, permit, permit modification, or written acknowledgement.

CA600EC Stabilization Measures Implemented - Exposure Control by Barrier and/or Institutional Control

EPA's or the State's notification or written acknowledgement to the RCRA facility that a stabilization activity or activities are required or otherwise being undertaken. The notification mechanism could be an enforcement order, order modification, permit, or permit modification or similar enforceable state authority requiring the facility to undertake stabilization activity; it may also take the form of a written acknowledgement from EPA or the State that stabilization activity is being undertaken. The notification or acknowledgement must contain written stabilization objectives, goals, performance standards, or desired results. The stabilization activity must control or abate threats to human health and/or the environment from releases, and/or prevent or minimize the further spread of contamination. Facility initiated stabilizations/interim measures shall also be tracked with this event code.

A status code of EC should be entered when the primary measure is exposure control by barrier and/or institutional control (e.g., capping, fencing, deed restrictions).

Initiating Source: Enforcement order, order modification, permit, permit modification, similar enforceable state authority requiring the facility to undertake stabilization activity, or written acknowledgement from the State or EPA that stabilization activity is being undertaken.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to sign the final order, order modification, permit, permit modification, or written acknowledgement.

Actual Date - Date the State or EPA signs the final order, order modification, permit, permit modification, or written acknowledgement.

CA600GW Stabilization Measures Implemented - Groundwater Extraction and Treatment

EPA's or the State's notification or written acknowledgement to the RCRA facility that a stabilization activity or activities are required or otherwise being undertaken. The notification mechanism could be an enforcement order, order modification, permit, or permit modification or similar enforceable state authority requiring the facility to undertake stabilization activity; it may also take the form of a written acknowledgement from EPA or the State that stabilization activity is being undertaken. The notification or acknowledgement must contain written stabilization objectives, goals, performance standards, or desired results. The stabilization activity must control or abate threats to human health and/or the environment from releases, and/or prevent or minimize the further spread of contamination. Facility initiated stabilizations/interim measures shall also be tracked with this event code.

A status code of GW should be entered when the primary measure is groundwater extraction and treatment (e.g., to achieve groundwater containment, to achieve MCL).

Initiating Source: Enforcement order, order modification, permit, permit modification, similar enforceable state authority requiring the facility to undertake stabilization activity, or written acknowledgement from the State or EPA that stabilization activity is being undertaken.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to sign the final order, order modification, permit, permit modification, or written acknowledgement.

Actual Date - Date the State or EPA signs the final order, order modification, permit, permit modification, or written acknowledgement.

CA600OT **Stabilization Measures Implemented - Other Activity**

EPA's or the State's notification or written acknowledgement to the RCRA facility that a stabilization activity or activities are required or otherwise being undertaken. The notification mechanism could be an enforcement order, order modification, permit, or permit modification or similar enforceable state authority requiring the facility to undertake stabilization activity; it may also take the form of a written acknowledgement from EPA or the State that stabilization activity is being undertaken. The notification or acknowledgement must contain written stabilization objectives, goals, performance standards, or desired results. The stabilization activity must control or abate threats to human health and/or the environment from releases, and/or prevent or minimize the further spread of contamination. Facility initiated stabilizations/interim measures shall also be tracked with this event code.

A status code of OT should be entered when the primary measure is other activity.

Initiating Source: Enforcement order, order modification, permit, permit modification, similar enforceable state authority requiring the facility to undertake stabilization activity, or written acknowledgement from the State or EPA that stabilization activity is being undertaken.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to sign the final order, order modification, permit, permit modification, or written acknowledgement.

Actual Date - Date the State or EPA signs the final order, order modification, permit, permit modification, or written acknowledgement.

CA600SR **Stabilization Measures Implemented - Source Removal and/or Treatment**

EPA's or the State's notification or written acknowledgement to the RCRA facility that a stabilization activity or activities are required or otherwise being undertaken. The notification mechanism could be an enforcement order, order modification, permit, or permit modification or similar enforceable state authority requiring the facility to undertake stabilization activity; it may also take the form of a written acknowledgement from EPA or the State that stabilization activity is being undertaken. The notification or acknowledgement must contain written stabilization objectives, goals, performance standards, or desired results. The stabilization activity must control or abate threats to human health and/or the environment from releases, and/or prevent or minimize the further spread of contamination. Facility initiated stabilizations/interim measures shall also be tracked with this event code.

A status code of SR should be entered when the primary measure is source removal and/or treatment (e.g., soil or waste excavation, in-situ soil treatment, off-site treatment).

Initiating Source: Enforcement order, order modification, permit, permit modification, similar enforceable state authority requiring the facility to undertake stabilization activity, or written acknowledgement from the State or EPA that stabilization activity is being undertaken.

Nationally Required - No

Schedule Date - Date the State or EPA is expected to sign the final order, order modification, permit, permit modification, or written acknowledgement.

Actual Date - Date the State or EPA signs the final order, order modification, permit, permit modification, or written acknowledgement.

Nationally Defined Values for Corrective Action Event Code

CA650 **Stabilization Construction Completed**

The event by which the State or EPA formally notifies the RCRA facility that the interim measures undertaken have been completed to the satisfaction of the Agency; and/or the event by which the State or EPA formally notifies the RCRA facility that stabilization objectives have been met, but require continued operation and maintenance to maintain this level of performance.

Initiating Source - Letter from the EPA or the State to the facility or an internal written memorandum acknowledging stabilization completion and/or construction completion - conducted through a final order, order modification, permit, permit modification, or written acknowledgement that the activity has occurred from EPA or the State.

Nationally Required - No

Schedule Date - Date the activity is expected to be completed.

Actual Date - Date the activity is completed.

Guidance - It was recommended that the corrective action program take credit nationally for stabilization efforts that are clearly completed, such as excavations, but also for those efforts that are performing to meet the Agency's stabilization objectives, yet require continued operation and maintenance to maintain this level of performance. The definition for CA650 incorporates these concepts. The definition allows "credit" once EPA or the State provides a written determination that the stabilization activity at a facility is completed in a manner that meets the stabilization objectives, goals, performance standards, or desired results. For example, an excavation is completed once the contaminated material has been removed in accordance with the objective of the stabilization measure. An additional example is a groundwater stabilization measure in which a pump and treat system has been constructed and is operating in a manner which achieves the stabilization objective even though continued operation and maintenance is necessary to maintain this level of performance.

The status codes for this event provide information on the types of stabilization actions that are being implemented. This information is routinely requested in Congressional inquiries and will be helpful to Headquarters in characterizing national implementation efforts.

CA650EC **Stabilization Construction Completed - Exposure Control by Barrier and/or Institutional Control**

The event by which the State or EPA formally notifies the RCRA facility that the interim measures undertaken have been completed to the satisfaction of the Agency; and/or the event by which the State or EPA formally notifies the RCRA facility that stabilization objectives have been met, but require continued operation and maintenance to maintain this level of performance.

A status code of EC should be entered when the primary measure is exposure control by barrier and/or institutional control (e.g., capping, fencing, deed restrictions).

Initiating Source - Letter from the EPA or the State to the facility or an internal written memorandum acknowledging stabilization completion and/or construction completion - conducted through a final order, order modification, permit, permit modification, or written acknowledgement that the activity has occurred from EPA or the State.

Nationally Required - No

Schedule Date - Date the activity is expected to be completed.

Actual Date - Date the activity is completed.

Guidance - It was recommended that the corrective action program take credit nationally for stabilization efforts that are clearly completed, such as excavations, but also for those efforts that are performing to meet the Agency's stabilization objectives, yet require continued operation and maintenance to maintain this level of performance. The definition for CA650 incorporates these concepts. The definition allows "credit" once EPA or the State provides a written determination that the stabilization activity at a facility is completed in a manner that meets the stabilization objectives, goals, performance standards, or desired results. For example, an excavation is completed once the contaminated material has been removed in accordance with the objective of the stabilization measure. An additional example is a groundwater stabilization measure in which a pump and treat system has been constructed and is operating in a manner which achieves the stabilization objective even though continued operation and maintenance is necessary to maintain this level of performance.

The status codes for this event provide information on the types of stabilization actions that are being implemented. This information is routinely requested in Congressional inquiries and will be helpful to Headquarters in characterizing national implementation efforts.

CA650GW Stabilization Construction Completed - Groundwater Extraction and Treatment

The event by which the State or EPA formally notifies the RCRA facility that the interim measures undertaken have been completed to the satisfaction of the Agency; and/or the event by which the State or EPA formally notifies the RCRA facility that stabilization objectives have been met, but require continued operation and maintenance to maintain this level of performance.

A status code of GW should be entered when the primary measure is groundwater extraction and treatment (e.g., to achieve groundwater containment, to achieve MCL).

Initiating Source - Letter from the EPA or the State to the facility or an internal written memorandum acknowledging stabilization completion and/or construction completion - conducted through a final order, order modification, permit, permit modification, or written acknowledgement that the activity has occurred from EPA or the State.

Nationally Required - No

Schedule Date - Date the activity is expected to be completed.

Actual Date - Date the activity is completed.

Guidance - It was recommended that the corrective action program take credit nationally for stabilization efforts that are clearly completed, such as excavations, but also for those efforts that are performing to meet the Agency's stabilization objectives, yet require continued operation and maintenance to maintain this level of performance. The definition for CA650 incorporates these concepts. The definition allows "credit" once EPA or the State provides a written determination that the stabilization activity at a facility is completed in a manner that meets the stabilization objectives, goals, performance standards, or desired results. For example, an excavation is completed once the contaminated material has been removed in accordance with the objective of the stabilization measure. An

additional example is a groundwater stabilization measure in which a pump and treat system has been constructed and is operating in a manner which achieves the stabilization objective even though continued operation and maintenance is necessary to maintain this level of performance.

The status codes for this event provide information on the types of stabilization actions that are being implemented. This information is routinely requested in Congressional inquiries and will be helpful to Headquarters in characterizing national implementation efforts.

CA650OT Stabilization Construction Completed - Other Activity

The event by which the State or the EPA formally notifies the RCRA facility that the interim measures undertaken have been completed to the satisfaction of the Agency; and/or the event by which the State or the EPA formally notifies the RCRA facility that stabilization objectives have been met, but require continued operation and maintenance to maintain this level of performance.

A status code of OT should be entered when the primary measure is other activity.

Initiating Source - Letter from the EPA or the State to the facility or an internal written memorandum acknowledging stabilization completion and/or construction completion - conducted through a final order, order modification, permit, permit modification, or written acknowledgement that the activity has occurred from the EPA or the State.

Nationally Required - No

Schedule Date - Date the activity is expected to be completed.

Actual Date - Date the activity is completed.

Guidance - It was recommended that the corrective action program take credit nationally for stabilization efforts that are clearly completed, such as excavations, but also for those efforts that are performing to meet the Agency's stabilization objectives, yet require continued operation and maintenance to maintain this level of performance. The definition for CA650 incorporates these concepts. The definition allows "credit" once the EPA or the State provides a written determination that the stabilization activity at a facility is completed in a manner that meets the stabilization objectives, goals, performance standards, or desired results. For example, an excavation is completed once the contaminated material has been removed in accordance with the objective of the stabilization measure. An additional example is a groundwater stabilization measure in which a pump and treat system has been constructed and is operating in a manner which achieves the stabilization objective even though continued operation and maintenance is necessary to maintain this level of performance.

The status codes for this event provide information on the types of stabilization actions that are being implemented. This information is routinely requested in Congressional inquiries and will be helpful to Headquarters in characterizing national implementation efforts.

CA650SR Stabilization Construction Completed - Source Removal and/or Treatment

The event by which the State or EPA formally notifies the RCRA facility that the interim measures undertaken have been completed to the satisfaction of the Agency; and/or the event by which the State or the EPA formally notifies the RCRA facility that stabilization objectives have been met, but require continued operation and maintenance to maintain this level of performance.

A status code of SR should be entered when the primary measure is source removal and/or treatment (e.g., soil or waste excavation, in-situ soil treatment, off-

site treatment).

Initiating Source - Letter from the EPA or the State to the facility or an internal written memorandum acknowledging stabilization completion and/or construction completion - conducted through a final order, order modification, permit, permit modification, or written acknowledgement that the activity has occurred from the EPA or the State.

Nationally Required - No

Schedule Date - Date the activity is expected to be completed.

Actual Date - Date the activity is completed.

Guidance - It was recommended that the corrective action program take credit nationally for stabilization efforts that are clearly completed, such as excavations, but also for those efforts that are performing to meet the Agency's stabilization objectives, yet require continued operation and maintenance to maintain this level of performance. The definition for CA650 incorporates these concepts. The definition allows "credit" once EPA or the State provides a written determination that the stabilization activity at a facility is completed in a manner that meets the stabilization objectives, goals, performance standards, or desired results. For example, an excavation is completed once the contaminated material has been removed in accordance with the objective of the stabilization measure. An additional example is a groundwater stabilization measure in which a pump and treat system has been constructed and is operating in a manner which achieves the stabilization objective even though continued operation and maintenance is necessary to maintain this level of performance.

The status codes for this event provide information on the types of stabilization actions that are being implemented. This information is routinely requested in Congressional inquiries and will be helpful to Headquarters in characterizing national implementation efforts.

CA725IN **Current Human Exposures Under Control - More Information Needed**

The event by which the State or EPA completes and Environmental Indicators (EI) Evaluation verifying that the current human exposures are under control in accordance with guidance from EPA Headquarters. EI evaluations are performed on a facility-wide basis. Therefore, this event should only be linked to the entire facility and not to specific areas.

A status code of IN should be entered when more information is needed to make a determination.

Initiating Source - Documentation of Environmental Indicator Determination form signed by preparer and his/her supervisor. Signed hard copies of the form should reside in the administrative file for the facility. These forms should also be kept in electronic format that can be posted on an "EI database" web site developed by the Office of Solid Waste. The web site for completed forms is currently under development. Blank EI guidance forms are available at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

Nationally Required - Yes

Schedule Date - Date this event is anticipated.

Actual Date - Date that the EPA or State documents that the facility has achieved the event, or that the event determination is no longer applicable.

Guidance - Effective 2/5/1999 per revised program guidance: Status codes NC and NA should no longer be used. Previously entered NC or NA status codes should be updated, but may remain in the database until they are replaced by more recent codes.

Implementers should consult the most recent EI guidance for performing an EI evaluation prior to entering this event code. EI guidance forms are available for downloading at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

CA725NO Current Human Exposures Under Control - Not Under Control

The event by which the State or EPA completes and Environmental Indicators (EI) Evaluation verifying that the current human exposures are under control in accordance with guidance from EPA Headquarters. EI evaluations are performed on a facility-wide basis. Therefore, this event should only be linked to the entire facility and not to specific areas.

A status code of NO should be entered when current human exposures are NOT under control.

Initiating Source - Documentation of Environmental Indicator Determination form signed by preparer and his/her supervisor. Signed hard copies of the form should reside in the administrative file for the facility. These forms should also be kept in electronic format that can be posted on an "EI database" web site developed by the Office of Solid Waste. The web site for completed forms is currently under development. Blank EI guidance forms are available at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

Nationally Required - Yes

Schedule Date - Date this event is anticipated.

Actual Date - Date that the EPA or State documents that the facility has achieved the event, or that the event determination is no longer applicable.

Guidance - Effective 2/5/1999 per revised program guidance: Status codes NC and NA should no longer be used. Previously entered NC or NA status codes should be updated, but may remain in the database until they are replaced by more recent codes.

Implementers should consult the most recent EI guidance for performing an EI evaluation prior to entering this event code. EI guidance forms are available for downloading at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

CA725YE Current Human Exposures Under Control - Under Control

The event by which the State or EPA completes and Environmental Indicators (EI) Evaluation verifying that the current human exposures are under control in accordance with guidance from EPA Headquarters. EI evaluations are performed on a facility-wide basis. Therefore, this event should only be linked to the entire facility and not to specific areas.

A status code of YE should be entered when current human exposures under control has been verified. Based on a review of information contained in the EI determination, current human exposures are expected to be under control at the facility under current and reasonably expected conditions. This determination will be reevaluated when the Agency/State becomes aware of significant changes at the facility.

Initiating Source - Documentation of Environmental Indicator Determination form signed by preparer and his/her supervisor. Signed hard copies of the form should reside in the administrative file for the facility. These forms should also be kept in electronic format that can be posted on an "EI database" web site developed by the Office of Solid Waste. The web site for completed forms is currently under development. Blank EI guidance forms are available at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

Nationally Required - Yes

Schedule Date - Date this event is anticipated.

Actual Date - Date that the EPA or State documents that the facility has achieved the event, or that the event determination is no longer applicable.

Guidance - Effective 2/5/1999 per revised program guidance: Status codes NC and NA should no longer be used. Previously entered NC or NA status codes should be updated, but may remain in the database until they are replaced by more recent codes.

Implementers should consult the most recent EI guidance for performing an EI evaluation prior to entering this event code. EI guidance forms are available for downloading at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

CA750IN **Groundwater Releases Controlled Determination - More Information Needed**

The event by which the State or EPA completes an Environmental Indicators (EI) Evaluation verifying that the migration of contaminated groundwater is under control in accordance with guidance from EPA Headquarters. EI evaluations are performed on a facility-wide basis. Therefore, this event should only be linked to the entire facility and not to specific areas.

A status code of IN should be entered when more information is needed to make a determination.

Intitiating Source - Documentation of Environmental Indicator Determination form signed by preparer and his/her supervisor. Signed hard copies of the forms should reside in the administrative file for the facility. These forms should also be kept in electronic format that can be posted on an "EI database" web site developed by the Office of Solid Waste. The web site for completed forms is currently under development. However, blank EI guidance forms are available for downloading at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

Nationally Required - Yes

Schedule Date - Date this event is anticipated.

Actual Date - Date that the EPA or State documents that the facility has achieved the event, or that the event documentation is no longer applicable.

Guidance - Effective 2/5/1999 per revised program guidance: The status codes NA and NR should no longer be used. Previously entered NA an NR status codes should be updated, but may remain in the database until they are replaced by more recent codes.

Implementers should consult the most recent EI guidance for performing an EI evaluation prior to entering this event code. EI guidance forms are available for downloading at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

CA750NO Groundwater Releases Controlled Determination - Unacceptable Migration of GW is Observed or Expected

The event by which the State or EPA completes an Environmental Indicators (EI) Evaluation verifying that the migration of contaminated groundwater is under control in accordance with guidance from EPA Headquarters. EI evaluations are performed on a facility-wide basis. Therefore, this event should only be linked to the entire facility and not to specific areas.

A status code of NO should be entered when unacceptable migration of contaminated groundwater is observed or expected.

Intitiating Source - Documentation of Environmental Indicator Determination form signed by preparer and his/her supervisor. Signed hard copies of the forms should reside in the administrative file for the facility. These forms should also be kept in electronic format that can be posted on an "EI database" web site developed by the Office of Solid Waste. The web site for completed forms is currently under development. However, blank EI guidance forms are available for downloading at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

Nationally Required - Yes

Schedule Date - Date this event is anticipated.

Actual Date - Date that the EPA or State documents that the facility has achieved the event, or that the event documentation is no longer applicable.

Guidance - Effective 2/5/1999 per revised program guidance: The status codes NA and NR should no longer be used. Previously entered NA an NR status codes should be updated, but may remain in the database until they are replaced by more recent codes.

Implementers should consult the most recent EI guidance for performing an EI evaluation prior to entering this event code. EI guidance forms are available for downloading at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

CA750YE Groundwater Releases Controlled Determination - Migration of Contaminated GW is Under Control

The event by which the State or EPA completes an Environmental Indicators (EI) Evaluation verifying that the migration of contaminated groundwater is under control in accordance with guidance from EPA Headquarters. EI evaluations are performed on a facility-wide basis. Therefore, this event should only be linked to the entire facility and not to specific areas.

A status code of YE should be entered when migration of contaminated groundwater under control has been verified. Based on a review of information contained in the EI determination, it has been determined that migration of contaminated groundwater is under control at the facility. Specifically, this determination indicates that the migration of contaminated groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the existing area of contaminated groundwater. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

Initiating Source - Documentation of Environmental Indicator Determination form signed by preparer and his/her supervisor. Signed hard copies of the forms should reside in the administrative file for the facility. These forms should also be kept in electronic format that can be posted on an "EI database" web site developed by the Office of Solid Waste. The web site for completed forms is currently under development. However, blank EI guidance forms are available for

downloading at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

Nationally Required - Yes

Schedule Date - Date this event is anticipated.

Actual Date - Date that the EPA or State documents that the facility has achieved the event, or that the event documentation is no longer applicable.

Guidance - Effective 2/5/1999 per revised program guidance: The status codes NA and NR should no longer be used. Previously entered NA an NR status codes should be updated, but may remain in the database until they are replaced by more recent codes.

Implementers should consult the most recent EI guidance for performing an EI evaluation prior to entering this event code. EI guidance forms are available for downloading at http://www.epa.gov/epaoswer/hazwaste/ca/eis.htm.

CA770GW Engineering Controls Established - Groundwater Control

This event signifies the establishment of engineering controls (ECs) as part of, or to augment, an interim or final corrective action. ECs consist of engineering measures (e.g, caps, treatment systems, etc.) designed to minimize the potential for human exposure to contamination by either limiting direct contact with contaminated areas or controlling migration of contaminants through environmental media. When ECs are established at the facility level (e.g., site security), this event should be linked to the "entire facility" area. When ECs are established and affect only portions of the RCRA facility, this event should be linked to the specific area affected by the control.

This event should also be entered when ECs are established for regulated units undergoing closure and/or post-closure care, including engineering controls required under 40 CFR 264 and 265.

A status code of GW should be entered for groundwater control which includes any EC pertaining to groundwater, including in situ and ex situ treatment like bioremediation, in situ permeable reactor barriers, monitored natural attenuation (MNA), long-term monitoring, etc.

Nationally Required - Yes

Schedule Date - Date ECs are projected to be fully constructed and operational.

Actual Date - Date ECs are fully constructed and operational.

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g., responsible agency contact information, website address, etc.).

Guidance - For further guidance with respect to ECs, refer to the latest One Cleanup Program guidance (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf.

CA770NG Engineering Controls Established - Non-groundwater Control

This event signifies the establishment of engineering controls (ECs) as part of, or to augment, an interim or final corrective action. ECs consist of engineering measures (.e.g, caps, treatment systems, etc.) designed to minimize the potential for human exposure to contamination by either limiting direct contact with contaminated areas or controlling migration of contaminants through environmental media. When ECs are established at the facility level (e.g., site security), this event should be linked to the "entire facility" area. When ECs are established and affect only portions of the RCRA facility, this event should be linked to the specific area affected by the control.

This event should also be entered when ECs are established for regulated units undergoing closure and/or post-closure care, including engineering controls required under 40 CFR 264 and 265.
A status code of NG should be entered for non-groundwater controls referring to any control not related to groundwater, such as barriers or caps.

Nationally Required - Yes

Schedule Date - Date ECs are projected to be fully constructed and operational.

Actual Date - Date ECs are fully constructed and operational.

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g., responsible agency contact information, website address, etc.).

Guidance - For further guidance with respect to ECs, refer to the latest One Cleanup Program guidance (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf.

CA772EP Institutional Controls Established - Enforcement and Permit Tools

This event signifies the establishment of institutional controls (ICs) as part of, or to augment, an interim or final corrective action. ICs are defined as non-engineered and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use. When ICs are established at the facility level (e.g., site security), this event should be linked to the "entire facility" area. When ICs are established and affect only portions of the RCRA facility, this event should be linked to the specific areas affected by the control.

This event should also be entered when ICs are established for regulated units undergoing closure and/or post-closure care, including notices to deed and survey plats required under Sub-part G of 40 CFR 264.

A status code of EP should be entered for enforcement and permit tools which includes permits, orders, or other enforceable agreements.

Nationally Required - Yes

Schedule Date - Date ICs are projected to be fully implemented and effective.

Actual Date - Date ICs are fully implemented and effective.

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g., responsible agency contact information, website address, etc.).

Guidance - For further guidance with respect to ICs, refer to the latest One Cleanup Program guidance (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf.

CA772GC **Institutional Controls Established - Governmental Control**

This event signifies the establishment of institutional controls (ICs) as part of, or to augment, an interim or final corrective action. ICs are defined as non-engineered and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use. When ICs are established at the facility level (e.g., site security), this event should be linked to the "entire facility" area. When ICs are established and affect only portions of the RCRA facility, this event should be linked to the specific areas affected by the control.

This event should also be entered when ICs are established for regulated units undergoing closure and/or post-closure care, including notices to deed and survey plats required under Sub-part G of 40 CFR 264.

A status code of GC should be entered when governmental control is implemented and enforced by State or local governments. It excludes permits, orders, and other enforceable agreements.

Nationally Required - Yes

Schedule Date - Date ICs are projected to be fully implemented and effective.

Actual Date - Date ICs are fully implemented and effective.

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g., responsible agency contact information, website address, etc.).

Guidance - For further guidance with respect to ICs, refer to the latest One Cleanup Program guidance (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf.

CA772ID **Institutional Controls Established - Information Device**

This event signifies the establishment of institutional controls (ICs) as part of, or to augment, an interim or final corrective action. ICs are defined as non-engineered and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use. When ICs are established at the facility level (e.g., site security), this event should be linked to the "entire facility" area. When ICs are established and affect only portions of the RCRA facility, this event should be linked to the specific areas affected by the control.

This event should also be entered when ICs are established for regulated units undergoing closure and/or post-closure care, including notices to deed and survey plats required under Sub-part G of 40 CFR 264.

A status code of ID should be entered for information devices including information or notification of contamination present at the property.

Nationally Required - Yes

Schedule Date - Date ICs are projected to be fully implemented and effective.

Actual Date - Date ICs are fully implemented and effective.

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g., responsible agency contact information, website address, etc.).

Guidance - For further guidance with respect to ICs, refer to the latest One Cleanup Program guidance (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf.

CA772PR Institutional Controls Established - Proprietary Control

This event signifies the establishment of institutional controls (ICs) as part of, or to augment, an interim or final corrective action. ICs are defined as non-engineered and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use. When ICs are established at the facility level (e.g., site security), this event should be linked to the "entire facility" area. When ICs are established and affect only portions of the RCRA facility, this event should be linked to the specific areas affected by the control.

This event should also be entered when ICs are established for regulated units undergoing closure and/or post-closure care, including notices to deed and survey plats required under Sub-part G of 40 CFR 264.

A status code of PR should be entered where proprietary control relies on legal instruments placed in the chain of title for the property.

Nationally Required - Yes

Schedule Date - Date ICs are projected to be fully implemented and effective.

Actual Date - Date ICs are fully implemented and effective.

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g., responsible agency contact information, website address, etc.).

Guidance - For further guidance with respect to ICs, refer to the latest One Cleanup Program guidance (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf.

CA780GW Engineering Controls Terminated - Groundwater Control

Use this event code when the engineering control is no longer required to protect human health and the environment. Use this code where a CA770 [Engineering Controls (ECs) Established] was entered and the control(s) subsequently terminated.

When ECs were established at the facility level (e.g. site security), this event should be linked to the 'entire facility' Area. When ECs were established and affect only portions of the RCRA facility, this event should be linked to the specific areas affected by the control or controls.

If both groundwater and non-groundwater controls exist for a particular area, enter an event code for each control.

A status code of GW should be entered when the control is related to groundwater such as situ and ex situ treatment like bioremediation, in situ permeable reactor barriers, monitored natural attenuation (MNA), long term monitoring, etc.

Initiating Source - Enter this code upon completion of required activities and approval by the State / EPA of the decision document required to terminate controls at the facility. This decision document would be the mechanism put in place by the State / EPA to terminate the controls, e.g. a permit mod.

Scheduled Date - Date EC is scheduled to be terminated

Actual Date - Date EC is terminated

Nationally Required - Yes

Responsible Agency - State or EPA

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g. responsible agency contact information, web site address, etc.). Indicate any specifics about the control termination.

Guidance - For further guidance with respect to ICs and/or ECs refer to the latest One Cleanup Program guide (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf

CA780NG **Engineering Controls Terminated - Non-groundwater Control**

Use this event code when the engineering control is no longer required to protect human health and the environment. Use this code where a CA770 [Engineering Controls (ECs) Established] was entered and the control(s) subsequently terminated.

When ECs were established at the facility level (e.g. site security), this event should be linked to the 'entire facility' Area. When ECs were established and affect only portions of the RCRA facility, this event should be linked to the specific areas affected by the control or controls.

If both groundwater and non-groundwater controls exist for a particular area, enter an event code for each control.

A status code of NG should be entered when the control is not related to groundwater such as barriers or caps.

Initiating Source - Enter this code upon completion of required activities and approval by the State / EPA of the decision document required to terminate controls at the facility. This decision document would be the mechanism put in place by the State / EPA to terminate the controls, e.g. a permit mod.

Scheduled Date - Date EC is scheduled to be terminated

Actual Date - Date EC is terminated

Nationally Required - Yes

Responsible Agency - State or EPA

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g. responsible agency contact information, web site address, etc.). Indicate any specifics about the control termination.

Guidance - For further guidance with respect to ICs and/or ECs refer to the latest One Cleanup Program guide (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf

CA782EP **Institutional Controls Terminated - Enforcement & Permit Tools**

Use this event code when the institutional control is no longer required to protect human health and the environment. Use this code where a CA772 [Institutional Controls (ICs) Established] was entered and the control(s) subsequently terminated.

When ICs are established at the facility level (e.g. site security), this event should be linked to the ‘entire facility’ Area. When ICs are established and affect only portions of the RCRA facility, this event should be linked to the specific areas affected by the control or controls.

If more than 1 control exists for a particular area, enter an event code for each control.

A status code of EP should be entered when it includes permits, orders or other enforceable agreements.

Initiating Source - Enter this code upon completion of required activities and approval by the State / EPA of the decision document required to terminate controls at the facility. This decision document would be the mechanism put in place by the State / EPA to terminate the controls, e.g. a permit mod.

Scheduled Date - Date IC is scheduled to be terminated

Actual Date - Date IC is terminated

Responsible Agency - State or EPA

Nationally Required - Yes

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g. responsible agency contact information, web site address, etc.). Indicate any specifics about the control termination.

Guidance - For further guidance with respect to ICs and/or ECs refer to the latest One Cleanup Program guide (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf

CA782GC Institutional Controls Terminated - Governmental Control

Use this event code when the institutional control is no longer required to protect human health and the environment. Use this code where a CA772 [Institutional Controls (ICs) Established] was entered and the control(s) subsequently terminated.

When ICs are established at the facility level (e.g. site security), this event should be linked to the 'entire facility' Area. When ICs are established and affect only portions of the RCRA facility, this event should be linked to the specific areas affected by the control or controls.

If more than 1 control exists for a particular area, enter an event code for each control.

A status code of GC should be entered when implemented and enforced by State or local governments; excludes permits, orders and other enforceable agreements.

Initiating Source - Enter this code upon completion of required activities and approval by the State / EPA of the decision document required to terminate controls at the facility. This decision document would be the mechanism put in place by the State / EPA to terminate the controls, e.g. a permit mod.

Scheduled Date - Date IC is scheduled to be terminated

Actual Date - Date IC is terminated

Responsible Agency - State or EPA

Nationally Required - Yes

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g. responsible agency contact information, web site address, etc.). Indicate any specifics about the control termination.

Guidance - For further guidance with respect to ICs and/or ECs refer to the latest One Cleanup Program guide (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf

CA782ID Institutional Controls Terminated - Informational Device

Use this event code when the institutional control is no longer required to protect human health and the environment. Use this code where a CA772 [Institutional Controls (ICs) Established] was entered and the control(s) subsequently terminated.

When ICs are established at the facility level (e.g. site security), this event should be linked to the 'entire facility' Area. When ICs are established and affect only

portions of the RCRA facility, this event should be linked to the specific areas affected by the control or controls.

If more than 1 control exists for a particular area, enter an event code for each control.

A status code of ID should be entered when it includes information or notification of contamination present at property.

Initiating Source - Enter this code upon completion of required activities and approval by the State / EPA of the decision document required to terminate controls at the facility. This decision document would be the mechanism put in place by the State / EPA to terminate the controls, e.g. a permit mod.

Scheduled Date - Date IC is scheduled to be terminated

Actual Date - Date IC is terminated

Responsible Agency - State or EPA

Nationally Required - Yes

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g. responsible agency contact information, web site address, etc.). Indicate any specifics about the control termination.

Guidance - For further guidance with respect to ICs and/or ECs refer to the latest One Cleanup Program guide (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf

CA782PR Institutional Controls Terminated - Proprietary Control

Use this event code when the institutional control is no longer required to protect human health and the environment. Use this code where a CA772 [Institutional Controls (ICs) Established] was entered and the control(s) subsequently terminated.

When ICs are established at the facility level (e.g. site security), this event should be linked to the ‘entire facility’ Area. When ICs are established and affect only portions of the RCRA facility, this event should be linked to the specific areas affected by the control or controls.

If more than 1 control exists for a particular area, enter an event code for each control.

A status code of PR should be entered when it relies on legal instruments placed in the chain of title for the property.

Initiating Source - Enter this code upon completion of required activities and approval by the State / EPA of the decision document required to terminate controls at the facility. This decision document would be the mechanism put in place by the State / EPA to terminate the controls, e.g. a permit mod.

Scheduled Date - Date IC is scheduled to be terminated

Actual Date - Date IC is terminated

Responsible Agency - State or EPA

Nationally Required - Yes

Notes - Indicate location where additional information concerning the specific control can be accessed (e.g. responsible agency contact information, web site address, etc.). Indicate any specifics about the control termination.

Guidance - For further guidance with respect to ICs and/or ECs refer to the latest One Cleanup Program guide (OSWER 9355.0-74FS-P). This document can be found at http://www.epa.gov/superfund/resources/institut/guide.pdf

CA800NO **Ready for Anticipated Use - No**

The event by which the State or EPA makes an RAU determination and completes an RAU form. The form notes that the RCRA facility, or designated portion of the facility, has met all of the following Ready for Anticipated Use Criteria outlined in the Cross-Program Revitalization Measures (CPRM) Guidance:

1) The facility or facility area has met the Human Exposures Environmental Indicator (CA725YE), and the event has been entered into RCRAInfo; 2) Cleanup goals have been achieved for media that may affect current and reasonably anticipated future land uses of the facility so that there are no unacceptable risks; and 3) All institutional or other controls, identified as part of a response action or remedy as required to help ensure long-term protection, are in place.

The RAU milestone is achieved when a piece of property can be safely used for an anticipated use and, depending upon the anticipated future use, may not require a facility-wide construction complete determination. For example, the surface of a property may be safely used at some facilities while groundwater contamination is still being addressed. More information on the Ready for Anticipated Use measure is presented in the "Guidance for Documenting and Reporting RCRA Subtitle C Corrective Action Land Revitalization Indicators and Performance Measures," February 21, 2007. This can be found at http://www.epa.gov/correctiveaction/resource/guidance/brfields/lr_guid.pdf.

RAUs for the entire facility must be linked to the "Entire Facility" area. Phased or partial RAUs are to be attached to specific areas of implementation and not to the "Entire Facility" area.

A status code of No should be entered when Ready for Anticipated Use is No. This status code applies if, for any reason, a previous RAU determination is no longer true (i.e. the anticipated use of a site could change or a human exposures determination could change).

Initiating Source - State or EPA RAU form completed, signed, and submitted to the file. The form indicates that each of the RAU criteria have been met, and whether the RAU determination is for specific areas or the entire facility.

Nationally Required - Yes

Actual Date - The date the State or EPA completes and signs the RAU form acknowledging, in writing, that the facility or facility area, has met the RAU criteria.

Guidance - The Ready for Anticipated Use measure is an important aspect of a RCRA Corrective Action cleanup as it communicates that a facility or facility area is safe and ready for its next anticipated use.

1. RCRA Corrective Action facilities that have achieved a CA999-Corrective Action Process Terminated determination have probably met the RAU criteria. Before an RAU determination is made for these facilities, however, the facility and/or the overseeing agency must verify that institutional controls are either unnecessary or are in place and effective.

2. Prior to making an RAU determination, the event code for achieving the human exposures environmental indicator (CA725YE) must be entered in RCRAInfo.

CA800YE **Ready for Anticipated Use - Yes**

The event by which the State or EPA makes an RAU determination and completes an RAU form. The form notes that the RCRA facility, or designated portion of the facility, has met all of the following Ready for Anticipated Use Criteria outlined in the Cross-Program Revitalization Measures (CPRM) Guidance:

1) The facility or facility area has met the Human Exposures Environmental Indicator (CA725YE), and the event has been entered into RCRAInfo; 2) Cleanup goals have been achieved for media that may affect current and reasonably anticipated future land uses of the facility so there are no unacceptable risks; and 3) All institutional or other controls, identified as part of a response action or emedy as required to help ensure long-term protection, are in place.

The RAU milestone is achieved when a piece of property can be safely used for an anticipated use and, depending upon the anticipated future use, may not require a facility-wide construction complete determination. For example, the surface of a property may be safely used at some facilities while groundwater contamination is still being addressed. More information on the Ready for Anticipated Use measure is presented in the "Guidance for Documenting and Reporting RCRA Subtitle C Corrective Action Land Revitalization Indicators and Performance Measures," February 21, 2007. This can be found at http://www.epa.gov/correctiveaction/resource/guidance/brfields/lr_guid.pdf.

RAUs for the entire facility must be linked to the "Entire Facility" area. Phased or partial RAUs are to be attached to specific areas of implementation and not to the "Entire Facility" area.

A status code of YE should be entered when Ready for Anticipated Use is Yes.

Initiating Source - State or EPA RAU form completed, signed, and submitted to the file. The form indicates that each of the RAU criteria have been met, and whether the RAU determination is for specific areas or the entire facility.

Nationally Required - Yes

Actual Date - The date the State or EPA completes and signs the RAU form acknowledging, in writing, that the facility or facility area, has met the RAU criteria.

Guidance - The Ready for Anticipated Use measure is an important aspect of a RCRA Corrective Action cleanup as it communicates that a facility or facility area is safe and ready for its next anticipated use.

1. RCRA Corrective Action facilities that have achieved a CA999-Corrective Action Process Terminated determination have probably met the RAU criteria.

Before an RAU determination is made for these facilities, however, the facility and/or the overseeing agency must verify that institutional controls are either unnecessary or are in place and effective.

2. Prior to making an RAU determination, the event code for achieving the human exposures environmental indicator (CA725YE) must be entered in RCRAInfo.

CA900CR **CA Performance Standards Attained - Controls Required**

This event indicates remedies selected for the protection of human health and the environment standard have been fully implemented and associated performance standards have been attained at the entire facility or specific areas within the facility.

A status code of CR should be entered when controls are required.

Initiating Source - Written acknowledgment, processed through proper procedures, that corrective action performance standards have been achieved.

Nationally Required - Yes

Scheduled Date - Date that the State or EPA expects to issue its written acknowledgment that corrective action performance standards have been achieved.

Actual Date - Date that the State or EPA issued its written acknowledgment that corrective action performance standards have been achieved.

Responsible Agency - EPA or the authorized State.

CA900NC **CA Performance Standards Attained - No Controls Are Necessary**

This event indicates remedies selected for the protection of human health and the environment standard have been fully implemented and associated performance standards have been attained at the entire facility or specific areas within the facility.

A status code of NC should be entered when no controls are necessary.

Initiating Source - Written acknowledgment, processed through proper procedures, that corrective action performance standards have been achieved.

Nationally Required - Yes

Scheduled Date - Date that the State or EPA expects to issue its written acknowledgment that corrective action performance standards have been achieved.

Actual Date - Date that the State or EPA issued its written acknowledgment that corrective action performance standards have been achieved.

Responsible Agency - EPA or the authorized State.

CA999 **Corrective Action Process Terminated**

This event indicates the completion of the corrective action process for the entire facility or for areas at the facility; that active remedial measures as specified in

the RCRA permit or enforcement order are completed, and that all obligations with respect to compliance with 40 CFR Part 264.101 or equivalent State requirements with respect to known Solid Waste Management Units (SWMUs) or Areas or Concern have been met.

This event should be entered 1) after the Certification of Remedy Completion or Construction Completion (CA550-CMI Completed), and/or 2) after a stabilization measure(s) has been completed in a manner that meets the stabilization objectives, goals, performance standards, and/or desired results (CA650), and terminating corrective action at this point at the facility or area would satisfy all permit or order requirements for CA.

Initiating Source - Written acknowledgement, places in the facility file, stating that all projected activity has been completed.

Nationally Required - Yes

Schedule Date - Date the event is scheduled to be completed.

Actual Date - Date the sequence of events was completed.

CA999NF **Corrective Action Process Terminated - No Further Action**

This event indicates the completion of the corrective action process for the entire facility or for areas at the facility; that active remedial measures as specified in the RCRA permit or enforcement order are completed, and that all obligations with respect to compliance with 40 CFR Part 264.101 or equivalent State requirements with respect to known Solid Waste Management Units (SWMUs) or Areas or Concern have been met.

This event should be entered 1) after the Certification of Remedy Completion or Construction Completion (CA550-CMI Completed), and/or 2) after a stabilization measure(s) has been completed in a manner that meets the stabilization objectives, goals, performance standards, and/or desired results (CA650), and terminating corrective action at this point at the facility or area would satisfy all permit or order requirements for CA.

A status code of NF should be entered when the site characterization has demonstrated the attainment of the final RCRA Corrective Action goals without any active remediation.

Initiating Source - Written acknowledgement, places in the facility file, stating that all projected activity has been completed.

Nationally Required - Yes

Schedule Date - Date the event is scheduled to be completed.

Actual Date - Date the sequence of events was completed.

CA999RM **Corrective Action Process Terminated - Remedial Activities Completed**

This event indicates the completion of the corrective action process for the entire facility or for areas at the facility; that active remedial measures as specified in the RCRA permit or enforcement order are completed, and that all obligations with respect to compliance with 40 CFR Part 264.101 or equivalent State requirements with respect to known Solid Waste Management Units (SWMUs) or Areas or Concern have been met.

Nationally Defined Values for Corrective Action Event Code

This event should be entered 1) after the Certification of Remedy Completion or Construction Completion (CA550-CMI Completed), and/or 2) after a stabilization measure(s) has been completed in a manner that meets the stabilization objectives, goals, performance standards, and/or desired results (CA650), and terminating corrective action at this point at the facility or area would satisfy all permit or order requirements for CA.

A status code of RM should be entered when active remediation or stabilization has been implemented and the facility has demonstrated the attainment of the final RCRA Corrective Action goals.

Initiating Source - Written acknowledgement, places in the facility file, stating that all projected activity has been completed.

Nationally Required - Yes

Schedule Date - Date the event is scheduled to be completed.

Actual Date - Date the sequence of events was completed.