

RCRA

HAZARDOUS WASTE PERMITTING PROGRAM

Permit Modifications Report:

*Safeguarding the Environment in the
Face of Changing Business Needs*

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This report was developed by hazardous waste permitting experts in state environmental programs and in the Environmental Protection Agency (EPA)'s Office of Resource Conservation and Recovery and regional offices.

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EXECUTIVE SUMMARY

The majority of facilities that are treating, storing, or disposing of hazardous waste have been issued permits under the Resource Conservation and Recovery Act (RCRA). The bulk of permitting activity has now shifted to responding to business needs and changes in facility operations while ensuring that the permitted conditions continue to be protective and prevent release. This report demonstrates the value of maintaining healthy RCRA permitting programs in order to efficiently respond to changes needed at facilities.

WHY HAZARDOUS WASTE PERMIT MODIFICATIONS ARE NECESSARY

Under RCRA, facilities managing hazardous waste must obtain a permit from their regulatory authority (i.e., the state or EPA). The purpose of the permit is to detail how a facility must comply with the RCRA regulations to ensure that hazardous waste management activities are conducted so as to prevent and address releases that could threaten public health and the environment and lead to potential cleanup obligations. These permits are site-specific and establish the technical and administrative standards to which a facility must adhere to legally and protectively manage hazardous waste. Thus, it is critical that modifications to the permit are made as necessary to enable the facility to effectively continue to operate treatment, storage, and disposal units.

Changes to permit conditions are often required to keep pace with evolving business practices, technology, cleanup decisions, and regulations. For example, permit modifications allow facilities to update technological systems, comply with new environmental standards, respond to changing waste streams, address financial assurance requirements, or simply improve their hazardous waste management practices.

These changes in turn can support enhanced operational efficiency, economic development, conservation of resources, improved prevention of environmental releases, and cleanup progress.

Most facilities may need to modify their permit more often than the permit needs to be renewed to accommodate time-critical business decisions, such as construction of a new waste management unit. Timely permit modifications enable facilities to efficiently expand and update their operations, adopt advanced greener technologies, remediate contamination, and address other vital business needs, while remaining protective of human health and the environment.

MOST PERMIT-RELATED WORK OCCURS AFTER INITIAL PERMIT ISSUANCE

The issuance of an initial permit reflects just the beginning of the permit-related work conducted by the regulatory authority. Over the life of a typical permitted hazardous waste management facility, significantly more time is devoted to permit maintenance than to permit issuance.

To better understand the workload associated with permit modifications, a group of state and EPA representatives reviewed data on permit modifications approved in 2011 through 2013. On average, 826 permit modifications were approved each year over the three-year period.

Permit modifications vary greatly in terms of complexity – a simple modification (Class 1 or Minor changes, such as a change in contact information) can be completed in as little as two or three hours. Class 1 modifications represent 83% of permit modifications reviewed during the period. More substantial modifications (Class 2, 3, and Major, such as adding a new waste management unit) combined represent 17% of permit modifications. The more substantial modifications can take up to 1,850 staff hours to address. Modifications that are technically complicated or have a high degree of public interest can take over a year to finalize (in addition to the 105 days of public review for Class 3's). See Section III for the process and timeframes for different classes of modifications.

Facilities that need permit maintenance are a large percentage (88%) of the RCRA permitting program's priority workload. However, the work has not been fully communicated or understood since modifications are not currently recognized under EPA performance goals and are not addressed in most state-EPA planning and budget negotiations. In that regard, this report presents a first look at the story of permit modifications, including the workload expended by states and EPA and the outcomes achieved for the environment and regulated community.



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INTRODUCTION

A. Purpose of this Report

The purpose of this report is to describe the changing nature of RCRA hazardous waste permitting work and demonstrate how an adequate and effective permit program is vital, not only for initial permits, but also throughout the permit term to enable necessary permit maintenance activities. Permit conditions that are developed when permits are initially issued frequently need to be revised during the permit term to address evolving facility conditions, for example, in response to business changes, as well as changes in applicable regulatory requirements. Permit maintenance, including permit modification, assures that permits remain effective, and allows owners and operators to adjust facility operations to meet changing conditions and demands.

This report highlights the workload associated with maintaining permits and describes why permit modifications are critical in order to enable improved business operations while maintaining protection of human health and the environment.

B. Background

The EPA established comprehensive protective national standards for managing solid and hazardous waste. These regulations for treatment, storage, and disposal facilities ensure that facilities that manage these wastes have the necessary controls to safeguard communities and the environment, while facilitating commerce by supporting an effective waste management structure. These controls are imposed primarily through permits and these permits are predominantly issued by authorized states.¹

Permits are essential to making the RCRA Subtitle C regulatory program work, since it is through the permitting process that the EPA or the states apply standards to hazardous waste treatment, storage, and disposal facilities (TSDFs). With permits and other enforceable waste management controls, RCRA actively protects the health of communities near hazardous waste management facilities, including the estimated 20 million people living within a mile of these facilities.² For example, RCRA requirements for landfills to install liners and leachate collection systems prevent hazardous contaminants from migrating into soil and potentially into surface water and groundwater, which are sources of drinking water. Furthermore, by containing leaks and spills, RCRA permit controls safeguard families and their homes from possible exposure. Permits also protect the public from hazardous air emissions by regulating hazardous waste combustors, including incinerators as well as boilers and commercial and industrial furnaces that combust hazardous waste, and by ensuring that volatile waste is properly contained and managed.

The public plays an important role in the permitting process for hazardous waste facilities. They and other interested parties can contribute valuable information and ideas that improve the quality of both agency decisions and permit applications. EPA has written regulations that create opportunities for the public to

¹ EPA Regions implement the RCRA program in Alaska, Iowa, and some territories. EPA regions also implement certain parts of the program for which some states have not yet been authorized (e.g., corrective action and some HSWA combustion regulations).

² Estimate drawn from an analysis that merged facility size and location information from RCRAInfo with population data, at the block and block group levels, from the U.S. Census Bureau's 2000 Census. The demographics were captured around the total number of facilities that have approved controls in place (e.g., permits and other approved controls) that result in the protection of this population (20 million people).

learn about RCRA activities and give input during the process for permit issuance and for modifications. There are meetings, comment periods, and hearings specifically for the public to engage companies and regulators in a dialogue. Furthermore, EPA encourages permitting agencies, permit holders or applicants, and other interested parties to provide additional public participation activities where it will be helpful.

Since the program has been implemented, permits and other enforceable controls have been put in place to prevent dangerous releases at over 20,000 units.³ Almost half of those units continue to require some level of oversight.⁴ The states (and EPA) regularly issue, modify, and update RCRA permits for hazardous waste units (such as incinerators and landfills) at facilities that treat, store, or dispose of hazardous waste. These RCRA permits establish the waste management activities a facility can conduct as well as the conditions under which it can conduct them.

Over the life of a typical permitted hazardous waste management facility, significantly more time is devoted to permit maintenance than to permit issuance. Permit maintenance involves a number of activities among which permit modifications are the most significant. The work involved after permit issuance/reissuance and the results of those efforts have been largely unrecognized mainly because RCRA permit modifications have not been included under EPA performance goals. This paper tells the story of permit modifications and the important role they play in keeping permits current. It also describes common challenges and complexities inherent in the permit modification process and highlights case studies that offer a glimpse of the content, process, and workload.

With facilities constantly changing, it is critical that states and EPA maintain sufficient expertise and resources to process permits in a timely manner and allow businesses, especially those in the manufacturing sector, the opportunity to adjust to variable markets. Although the vast majority of hazardous waste management facilities have permits in place, there is a continuing challenge to keep pace with technology in a way that encourages safe and innovative waste management.

C. Organization of this Report

This report is divided into two primary components:

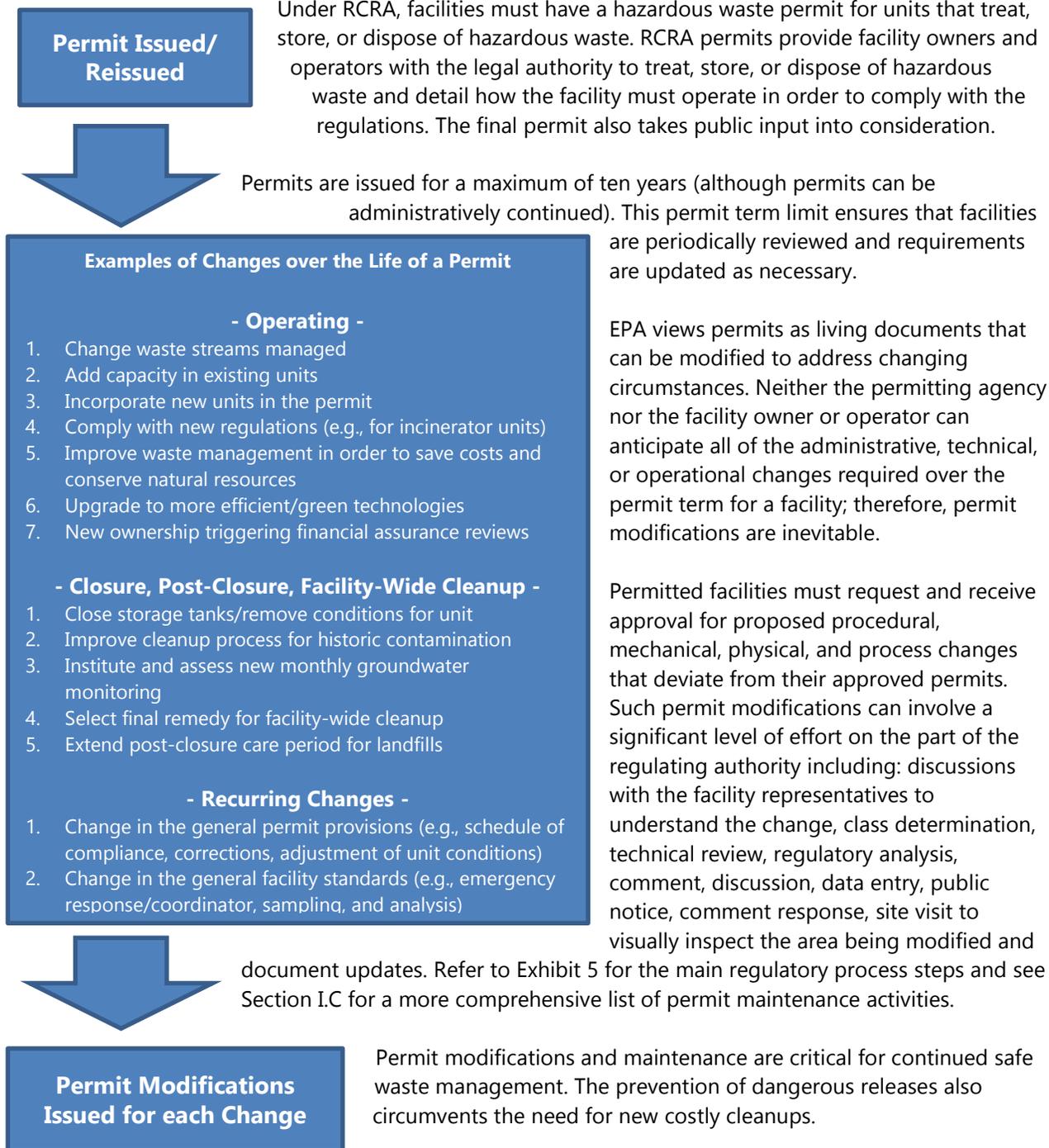
- **Part 1** provides information on the permit modification process. It describes what happens to a facility after it has received a permit, discusses why permit modifications have been largely an “untold story” in light of the focus on issuing and renewing permits, and provides facts and figures to set context for the workload associated with responding to modification requests.
- **Part 2** presents a series of case studies that show permit modifications “in action.” The case studies describe real-world situations where the state permitting programs and businesses have worked together at facility improvements – where changes to permits continue to ensure proper safeguards remain in place and allow companies to respond to changing business needs or pursue innovative approaches to responsible hazardous waste management.

³ These units have met the criteria for “approved controls in place to prevent release,” per the unit information entered into RCRAInfo. This includes historical records. See the GPRA “approved controls” description in Appendix 2.

⁴ The oversight total (9,000 units) is from RCRAInfo in the “Full Oversight Workload for Permitting (Operating and Post-closure) and Closure Report” as of 3-12-14.

PART 1

I. WHAT HAPPENS TO A FACILITY AFTER IT IS PERMITTED?



A. Continual Work for Protection of Human Health and the Environment

Permit writers continually work with facilities to ensure that sound operating procedures and proper waste management practices are being conducted in a way that is protective of human health and the environment. When changes to facility design and operations are proposed, permit writers assess the impacts, including the potential for releases of hazardous waste or hazardous constituents. Permit writers also make sure that permits reflect decisions that enable facility cleanup to effectively move forward. (See the case studies in Part 2 for specific examples.)

The permit establishes the administrative and technical conditions under which a facility must operate. The permitting authority's ongoing oversight of facility operations and interactions with the facility contacts are essential to ensuring the continual protectiveness of permit conditions. These activities are an important element of permit maintenance and can help both parties identify potential modifications that might be needed to support evolving waste management methods or other changing needs at the facility.

Permit maintenance prevents hazardous waste releases as operations change:

Initial permit conditions are established in order to ensure hazardous waste is safely managed and to prevent releases to the environment. As facility operations or other factors change through time, permitting authorities need to work with the facility to ensure that conditions outlined in the permit *continue* to prevent releases and require best waste management practices.

There are valid environmental reasons for formal approval of the facility changes in order to prevent release. For example, secondary containment not adjusted to allow for increases in quantity of hazardous waste managed could pose an increased risk of release, which in turn may result in human exposure and a lengthy and costly cleanup. The regulator must assess changes in order to ensure that they are appropriate and protective.

The RCRA Hazardous Waste Permitting Program

The Resource Conservation and Recovery Act (RCRA) provides the general requirements for EPA's waste management program. The RCRA hazardous waste permitting program, established under RCRA Subtitle C, ensures the safe treatment, storage, and disposal of hazardous waste by establishing administrative and technical requirements under which a hazardous waste management facility must operate.

Permits typically include conditions governing facility design and operation; safety standards; emergency plans; corrective action programs designed to respond to releases; financial assurance for unit closure and post-closure maintenance; and other required activities, such as employee training, monitoring, and reporting. The permitting process includes the issuance of initial permits, modifications, renewals, and termination.

Facilities that are required to obtain RCRA permits must request and receive approval for procedural, mechanical, physical, and process changes that deviate from their approved permits.

For more information about hazardous waste permitting, see <http://www2.epa.gov/hwpermitting>

B. Permit Modification Requests: Objectives and Outcomes

Permit modifications respond to various business needs by revising the permit to ensure that the changes are protective of human health and the environment. Changes to the facility operations and related permit modifications can have the effect of improving a facility's operational efficiency, economic development, as well as allowing for creative problem solving and other aspects such as facility management. Some modifications are initiated due to changing environmental requirements. (See the case studies in Part 2 for specific examples.)

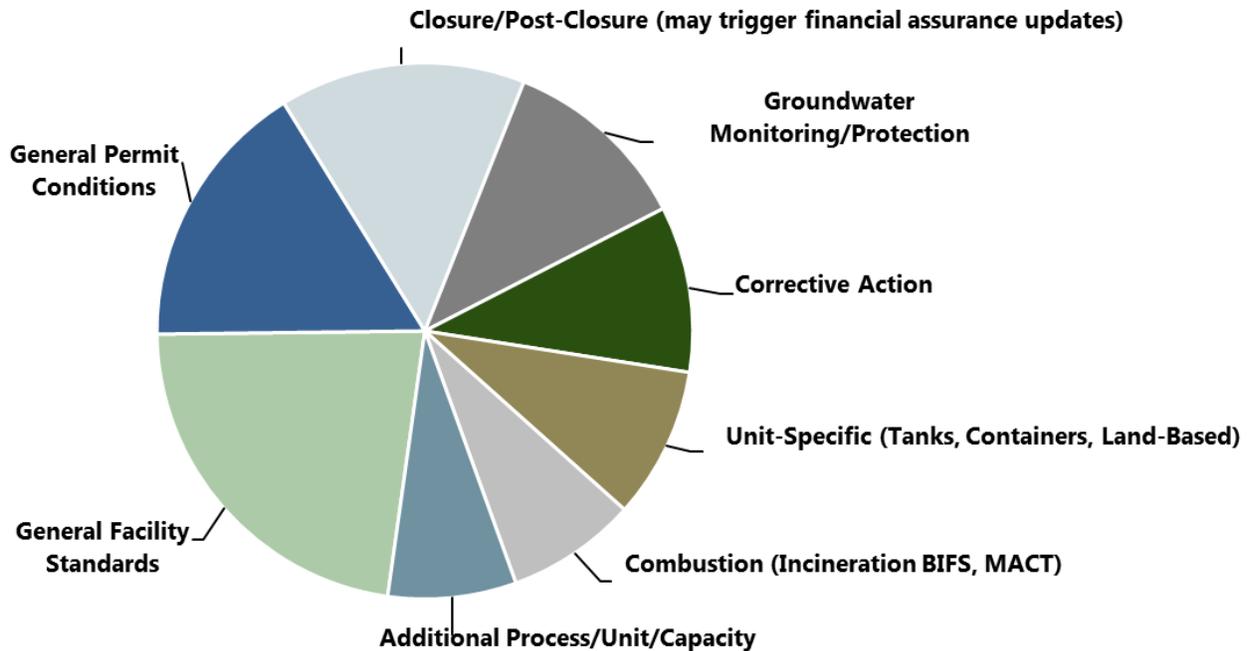
Reasons for Permit Modification Requests

- **Operational efficiency:** Permit modifications allow for development and implementation of new technologies and systems while ensuring protective standards. These changes can improve the efficiency of facility operations, which lead to ancillary effects such as operational cost savings or environmental improvement. For example, by expanding its waste management capacity, a facility can reduce transportation costs and corresponding environmental impacts associated with off-site treatment or disposal. Other changes, such as the addition of new treatment technologies or redesign of storage areas, may lead to operational efficiencies at the facility.
- **Economic development:** Companies may request permit modifications in order to incorporate changes needed to grow and expand their business and waste management infrastructure. For example, permit modifications allow companies to install new units for treating or disposing of hazardous waste or to incorporate new waste management processes that allow companies to treat new waste streams. Timely permit modifications ensure that these changes maintain protection of human health and the environment while allowing companies to keep pace with changes in the marketplace and assure their competitiveness.
- **Environmental improvement:** Permit modifications can lead to environmental improvements in multiple ways. Many modifications facilitate cleanup of contaminated soil or groundwater, which reduces risks to human health and the environment. Other modifications allow facilities to increase the recycling or reuse of materials, thus reducing corresponding waste streams. Some changes are undertaken to improve technological or operational efficiency; these can have ancillary environmental benefits, such as reductions in fossil fuel use and greenhouse gas emissions. Permit modifications may also be triggered by changes to environmental regulations (e.g., new air quality standards may require removal of hazardous pollutants from stack emissions, creating a new waste stream that must be managed).
- **Other:** Permit modifications can also be made in response to general improvements in waste management. Common modifications that can improve waste management practices are updates to waste analysis plans or contingency plans for emergency response actions. Administrative changes, such as revisions to facility contact information, or changes to facility ownership are addressed through modifications.

The issues addressed by permit modifications range from minor administrative changes to significant physical changes at a facility.

Exhibit 1 summarizes the distribution of permit modification approvals for 2011 through 2013. As shown in the graphic, changes to general facility standards, general permit conditions, closure/post-closure (which may trigger financial assurance updates⁵), groundwater monitoring/protection, and corrective action represented a large percentage of all permit modification approvals.⁶ The modifications cover operating and post-closure permits. A growing number of modifications are for permits that have been continued in order to address facility-wide corrective action after the TSD units are clean closed. The case studies presented in Part 2 of this report describe the kinds of permit modifications in more detail.

Exhibit 1. General Distribution of Permit Modification Approvals by Type (2011-2013)



Note: EPA calculated this distribution using data from the RCRAInfo database where the modification type was identified in the code or the notes for "other modifications." This does not reflect data from all states. Modifications were not required to be tracked in RCRAInfo in this timeframe. (Sample size: 788 permit modifications out of 2479). See details about RCRAInfo Data in Appendix 2.

C. Permit Maintenance Activities

With the vast majority of the hazardous waste management facilities already permitted, permit maintenance, including modifications, account for most of the permitting workload. The maintenance of permits involves processing and approval of modifications, as well as other oversight activities, such as compliance inspections, responding to the public's calls and questions, and review of routine facility reports. Below are examples of permit maintenance activities that occur throughout the life of the permit.

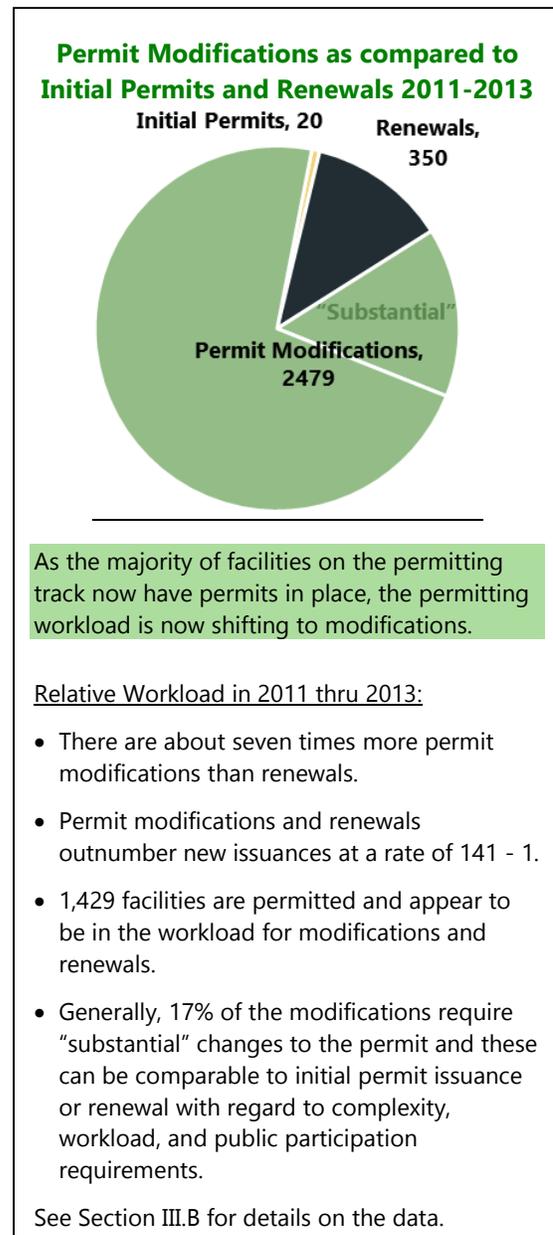
⁵ Although changes to the closure and post-closure plan typically require updates to a facility's financial assurance, regular maintenance of a facility's financial assurance alone does not generally trigger a permit modification. Maintenance of financial assurance includes annual verification of the financial documents submitted by facilities to ensure the amount is adjusted for inflation and the mechanism is still valid and, when necessary, additional steps to ensure coverage remains in place (e.g., response to instrument provider cancellation requests).

⁶ This pie chart is intended to show the *general ratio* of activities involved in the various permit modification approvals, not specific amounts or percentages. The state data that could be relied on for this assessment is only 32% of the national total. It does not include data for all states, nor does it include approvals entered where the activity was not specified in the code type or in the notes. See Appendix 2 for additional details. State ratios vary considerably, for example, Texas has a larger percentage of combustion modifications.

Examples of Permit Maintenance:

- **Modification Activities**
 - Initial discussion with facility representative regarding details of planned facility changes and determination of modification class
 - Review/approval of modification requests and associated deliverables required under the regulations or schedules of compliance in the permit and conduct site visits
 - Conduct public participation activities, such as solicitation of public comment and public meetings or hearings (may be adjudicated)
 - Conduct environmental assessments
 - Compile environmental impact statements
 - Perform other required procedural activities, see the process outlined in Exhibit 5

- **Other Permit Oversight and Maintenance Activities**
 - Review/approval of documents and routine reports required under the regulations or schedules of compliance in the permit (e.g., semi-annual/annual groundwater monitoring reports)
 - Conduct compliance inspections
 - Review of facility demonstrations of financial assurance
 - Respond to citizen/media calls
 - Facility management planning
 - Data management
 - Respond to internal inquiries and file review requests
 - Permit billing (cost recovery) activities
 - Participate in meetings, phone calls, and site visits



The modifications can trigger a great deal of unanticipated work. For example, the transfer of facility ownership is a Class 1 modification, usually the simplest modification to process, but it also involves changes in the financial assurance mechanisms (e.g., trust fund, insurance policy, or letter of credit), granting a release for previous owner, and other responsibilities in addition to the actual modifications to the permit. Other activities can require special technical expertise. Activities, such as environmental assessments and impact statements, could be done in concert with efforts to "green" the permit (see Part 2 Section B). In summary, permit maintenance work is more than just making specific edits to permit criteria; the permit review must assess the overall waste management practices of the facility in order to make sure the change in the permitted activity is in compliance with the regulations.

II. THE UNTOLD STORY

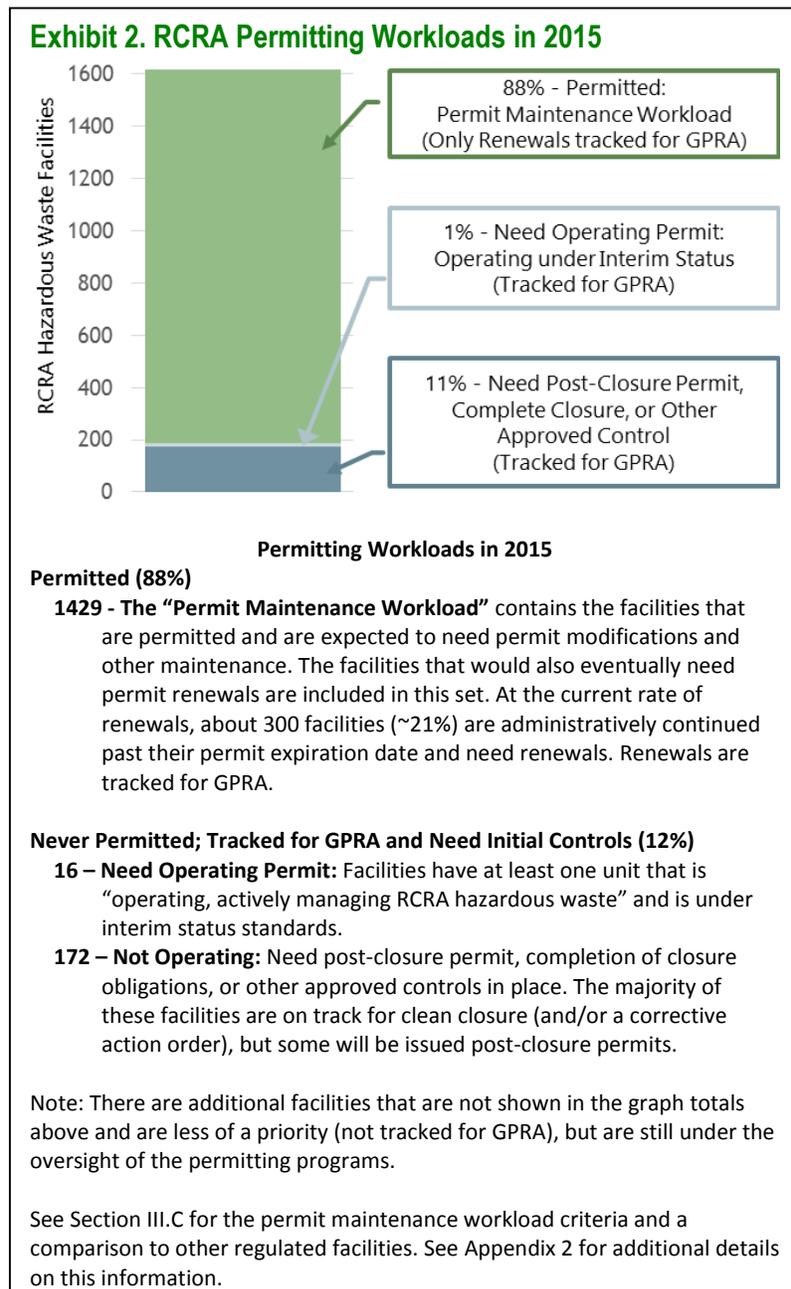
A. Why Modifications are an Untold Story

The first RCRA permit deadlines came with the 1984 Hazardous and Solid Waste Amendment (to RCRA) and issuing permits became a major goal for RCRA programs. For many years, EPA and authorized state agencies have continued to focus on the issuance of new and updated regulatory controls (primarily initial permits and permit renewals) as a core program performance measure. This national performance measure was largely an outgrowth of the Government Performance and Results Act (GPRA) of 1993, which mandated that federal agencies establish performance measures to gauge the success of their programs.

Today, RCRA permits have been issued to the vast majority of facilities in the GPRA workload, and many of those permits have been reissued. Exhibit 2 shows the current related permitting program workloads. EPA's RCRA program continues to establish national goals for initial controls (permit issuance, clean closure, or other controls in place) and renewals.

A primary purpose of RCRA permitting requirements is to ensure that ongoing hazardous waste management activities are protective and do not result in cleanup obligations; however, the preventive nature of the permitting program is difficult to track as a performance measure. Permitting and permit

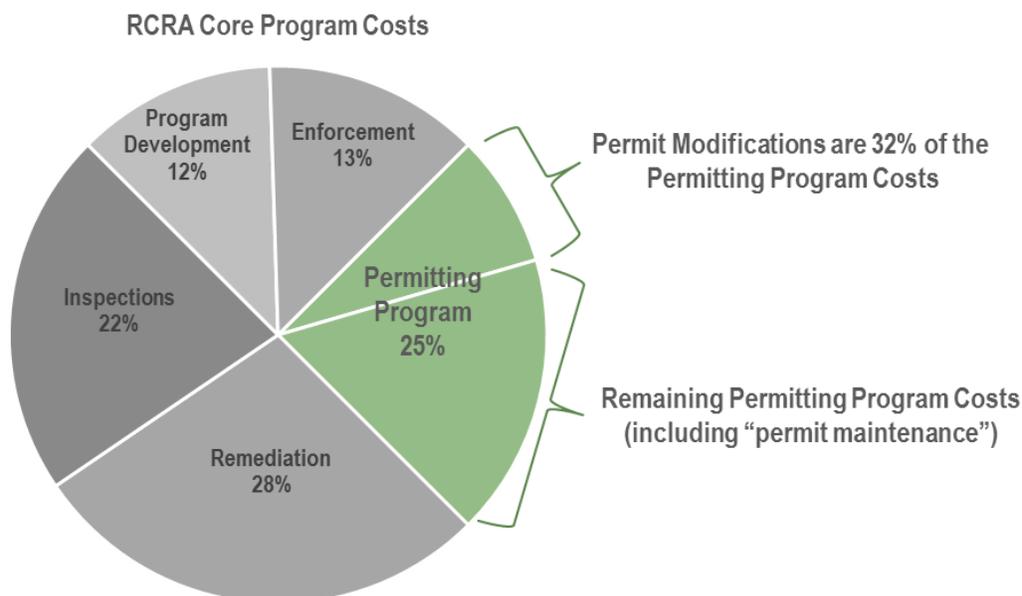
maintenance are nonetheless ongoing and effective tools in ensuring that hazardous wastes are not mismanaged. Whereas the Agency has been able to successfully track permit issuance and renewal since they are "predictable" tasks, permit modifications have not been included in core program performance measures or national goals for very practical reasons. The frequency, timing, and complexity of permit



modification requests in any given year is unpredictable, primarily because the majority of these requests are initiated by facilities.

The workload uncertainty keeps the program from projecting the number of modification approvals to be accomplished, but resources nonetheless have to be prioritized and in place in order to address them. Modifications represent a substantial workload for EPA and the authorized states and they should be considered along with the accomplishments tracked in the RCRA core programs. The Association of State and Territorial Solid Waste Management Officials (ASTSWMO's) *State RCRA Subtitle C Core Hazardous Waste Program Implementation Costs Final Report*, published in January 2007, discussed this in detail, emphasizing that an estimated 32 percent of costs to the state authorized hazardous waste permitting program can be attributed to permit modifications (see Exhibit 3). This does not include all permit maintenance activities. The ASTSWMO's report also states: "In terms of overall State RCRA Core C program costs, permit modifications represent the single most costly activity that States perform."⁷

Exhibit 3. Relative RCRA Program Costs to States in 2007



Since the 2007 report, more facilities have been issued an initial permit and the permit renewal backlog is diminishing, thus shifting *more of the work towards maintenance* (including modifications).

The proportion of State Core RCRA Subtitle C program workloads and associated costs devoted to permit modifications are now understood but, to date, there has been little discussion of the economic, environmental, and regulatory benefits of permit modifications and these are often not fully considered during annual planning and funding negotiations.

⁷ ASTSWMO's full report is available at: http://www.astswmo.org/Files/Policies_and_Publications/Hazardous_Waste/Final%20Report%20-%20RCRA%20Subtitle%20C%20Core%20Project.pdf

B. Why an Efficient Permit Modification Process is Necessary

Speed of business has accelerated. The hazardous waste landscape has evolved considerably since the regulations were established in the early 1980s. Since then, personal computer use and electronic communications are ubiquitous, innovations in information technology have exploded, and the pace of globalization and trade has quickened. As business needs accelerate, EPA and the states have sought more efficient ways to review permit modifications in order to ensure permits remain protective of human health and the environment without encumbering business needs. Tools such as model permits, templates, regulatory guidance, and training allow regulatory authorities to issue hazardous waste modifications that are protective of the environment and responsive to business.

Urgent Changes. To stay competitive, owners and operators must respond faster to changes in their marketplace. They must be at the ready to implement changes that will reduce costs, expand infrastructure, and develop new markets. Timely permit modifications are critical for responding to these needs in a manner that is protective of human health and the environment while avoiding delays in time-critical decisions.

Permit modifications that enable businesses to implement changes to improve protectiveness, such as changes to increase recycling, minimize waste, and improve cleanup of sites are paramount to meeting the intent of RCRA. For example, the RCRA corrective action program has focused on increasing progress toward constructing cleanup remedies. Timely modification of a permit to incorporate a cleanup remedy decision contributes to more prompt reduction of current and future risks from contamination. It is vital that permit modifications are processed efficiently and effectively to avoid costs to the environment as well as to industry.

Federal and state regulators must carefully review permit modifications to ensure the action is in compliance with regulatory requirements and is protective of human health and the environment. Regulators must also provide adequate opportunity for the public to have a voice regarding decisions that potentially affect their community (i.e., a change in treatment may trigger a need for storage that the facility did not anticipate). When the regulatory agency is able to quickly shift priorities and resources, these activities can be implemented expeditiously, and thus better align with the facility's business-related schedules and deadlines, as well as bring environmental protections into place in a timely manner.

Permitting Resources Needed to Respond to the Shift: In the past, RCRA permitting programs have primarily focused on issuing permits, but with the majority of the hazardous waste management facilities already permitted, permit maintenance and modifications account for most of the permitting workload. In addition, businesses have come to expect timely attention and service to their permit-related applications, especially in light of the permitting fees they pay in many states, yet at the same time federal and state hazardous waste resources devoted to providing such service have diminished.

The first step in addressing these issues is bringing attention to the issue. This issue was first highlighted in ASTSWMO's 2007 RCRA Core Report. This 2007 Report provided an accounting of workloads in broad programmatic areas within the hazardous waste realm and clearly identified the resources devoted to new permit issuance/reissuance versus other permit related activities including permit modifications. One conclusion of this analysis was that there was (and continues to be) a major shift in program emphasis since the early 1980s to permit modifications/maintenance in permit-related areas. As a result of the shift, significant federal and state program resources have been diverted to work in these areas, which is supported by the statistics contained in the ASTSWMO report and this paper.

III. PERMIT MODIFICATIONS: STATUS AND STATISTICS

A. Permit Modification Process and Timeframes

The procedures for making changes to a permit will vary depending on whether the permitting authority or the permittee is initiating the change.

There are three basic situations that involve changes to a permit after issuance/reissuance:

- Permit modification at the request of the permittee (see 40 CFR 270.42, the most common)
 - Class 1, Class 2, and Class 3 described below
- Permit modification at the request of the State/EPA (see 40 CFR 270.41, this is very rare)
 - Modification of the permit
 - Revocation and reissuance of the permit
- Termination of the permit (see 40 CFR 270.43, not a “modification”)

RCRA permit modifications are organized into three classes.^{8, 9}

Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operations. These changes do not substantially alter the conditions in the initial permit or reduce the facility’s ability to protect human health and the environment. Some Class 1 modifications (such as a change in the emergency contacts) do not require prior approval by EPA or the authorized state-permitting agency. However, most changes require prior approval. Class 1’s are typically the easiest to process. Most are simple changes to the permit, although some can be rather difficult to address, such as a change in ownership, which triggers financial assurance changes.

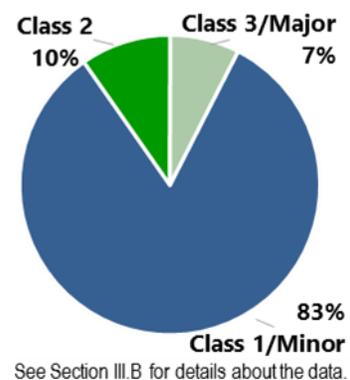
- **Expected Staff Time to Address: 2-25 hours** (100 hours or more for ownership changes especially with complex facilities that have multiple owners under one permit.)

Class 2 modifications address changes needed to maintain safety or regulatory compliance at the facility. In particular, Class 2 modifications apply when facility owners and operators need to respond to common variations in the types and quantities of waste managed by the facility, technological advancements, and new regulatory requirements, where those changes can be made without substantially changing the design specifications or management practices in the permit.

- **Expected Staff Time to Address: 41-119 hours** (up to 340 hours in rare cases)

Class 3 modifications are major changes that substantially alter the facility or its operations. For example, changes to waste management practices to accommodate new types of waste, substantial increases in storage capacity, or changes to the facility’s groundwater monitoring program would require a Class 3 modification. Modifications in this classification have a wide range of complexity and typically include the more complicated permit changes.

- **Expected Staff Time to Address: 59-640 hours** (up to 1850 hours in rare cases)



⁸ Several states (AL, FL, ME, MN, NY, OH, and SC) use the original “major or minor” permit modification categories in lieu of the three class system introduced in a 1988 rule (53 FR 37912).

⁹ The “Expected Staff Time” ranges come from the 2007 ASTSWMO Core report. See also background in Appendix 2.

Exhibit 4 provides examples of the types of changes covered by each modification classification.

Exhibit 4. Examples of Permit Modification Classifications

Class 1	Class 2	Class 3
Administrative and informational changes	Changes in frequency or content of inspection schedules	Creation of a new landfill as part of closure
Correction of typographical errors	Minor changes to corrective action	Addition of corrective action remedy
Changes in names, addresses, and phone numbers of emergency coordinators	Changes to facility training plan that affect the type or amount of employee training	Addition of compliance monitoring to groundwater monitoring program
Changes to comply with new regulations for analytical quality control plans, or waste sampling and analysis methods	Changes in number, location, depth, or design of groundwater monitoring wells	Addition of temporary incinerator for closure activities
Note: Permit modifications are classified in more detail in 40 CFR 270.42, Appendix I, which is described in “Modification Types Based on Regulatory Descriptions” in Appendix 1 of this report.		

The process for modifying a permit differs depending on the classification of the modification. For Class 2 and Class 3 modifications, the modification process follows a series of defined steps similar to the initial permit application process. In contrast, the administrative requirements for Class 1 modifications are comparatively minor. Class 2 and Class 3 modifications require the facility to follow several steps to encourage public participation. These steps include publishing a notice of the request for permit modification in a public newspaper; holding a public meeting; and allowing a 60-day public comment period on the requested modification. Exhibit 4 illustrates the modification process for all three Classes.

Typical timeframes for completion of modifications are based on the time needed for public comment, complexity of the modification request, class type, and availability of agency staff resources. The permitting agency may need additional information from the facility in order to make a decision and these interactions can be lengthy. Denials are relatively rare since provisions allow for revisions and extensions. The permitting agency may also determine that the class should be higher or lower (or deciding if a Class 1 needs prior approval) based on the change being made.

Agency-initiated modifications generally require a similar process to issuing a full permit (these are not as common as facility initiated modifications).

Temporary authorizations, as described in 40 CFR 270.42(e), can be requested for the following objectives:

- Facilitate timely implementation of closure or corrective action
- Prevent disruption of ongoing waste management activities
- Respond to sudden changes in the types or quantities of waste managed
- Allow specific treatment or storage in order to comply with land disposal restrictions
- Facilitate other changes to protect human health and the environment

Temporary authorizations allow the changes to a permitted activity to take affect sooner than the regular modification process allows. If the changed activity must continue after expiration of the temporary authorization, a regular modification process would still be required. Temporary authorizations are allowed for modifications that would normally be included in a Class 2 or 3 modification request. A creation of a temporary storage unit to store hazardous waste prior to treatment or disposal would be an example of a situation where the use of a temporary authorization would be appropriate.

Public input can also help permittees or prospective applicants make better decisions during the process. Public interest tends to be high for facilities receiving their initial permit and may decline over the lifespan of a permit, particularly at facilities that have modified their permit many times (sometimes over 100 changes). Effective and meaningful public participation remains critical for informing decisions made by the facility managers as well as the regulating agency.

See Exhibit 5 for the regulatory public participation requirements based on the permit modification class. The main required components of public participation for permit modifications are:

- Notification of the facility's modification request sent to mailing list;
- Publication in local paper and modification request made available to public (Class 2 and 3);
- 60-day public comment period for the facility's modification request (Class 2 and Class 3);
- Public meeting hosted by the facility (Class 2 and Class 3);
- Notification of the decision;
- 45-day public comment on the draft permit conditions (Class 3); and
- Public hearing (if requested for Class 3).

In many cases, expanded public participation efforts (such as use of modern technology) are recommended.¹⁰ For example, greater outreach may be needed for modifications that involve potential off-site impacts, such as air emissions or cleanup of releases that have migrated off-site. Additionally, greater outreach may be warranted to more effectively support communities when the facility is located near disadvantaged areas or when facilities are clustered and thus may add to cumulative potential impacts at adjacent communities.

Staff time needed to address permit modifications can vary greatly. A simple modification can take as little as several hours to administer and approve, while more complex modifications may take up to 1,850 staff hours to assess and approve.¹¹ Exhibit 5 demonstrates the steps involved in reviewing and approving each class of modification request.

EPA regulations specify that Class 2 modifications generally are to be concluded within 3-4 months. By contrast, EPA regulations do not specify a deadline for completion of Class 3 modifications. Class 3's tend to take more time due to the complexity of the issues in addition to the 105 days total of public review.

Case-Specific Issues

In addition to the process steps involved in reviewing permit modifications, other factors can greatly add to the processing time:

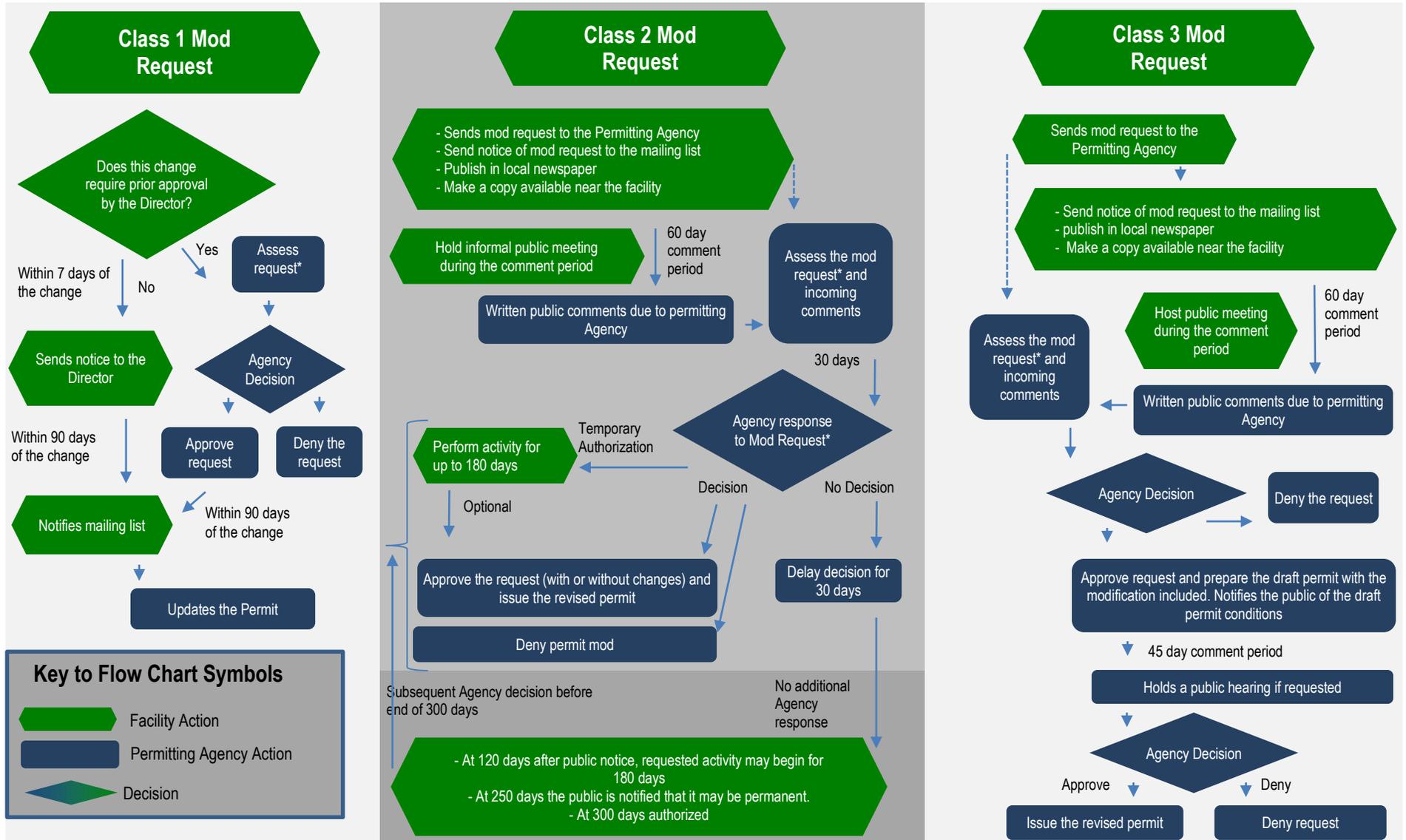
- Unanticipated communication between the state and the facility due to incomplete applications.
- Additional activities needed in order to follow the prescribed regulatory steps such as a monthly follow-up with required monitoring reports.
- Complexities, such as those resulting from change of ownership and parceling of property.
- Assessment as to which class of permit modification is appropriate.
- Multiple modifications in different phases of the process for the same facility.

Please see the case studies in Part 2, which help illustrate these issues.

¹⁰ EPA is currently updating the 1996 RCRA Public Participation Manual, which will provide further guidance regarding expanded public participation. See the website (<http://www2.epa.gov/hwpermitting>) for the current manual and the one to be revised.

¹¹ The high end of the staff time it can take to address permit modifications (1,850 hours) is from Appendix I of the 2007 ASTSWMO Core report (under "Estimation of Work Hours" page 39).

Exhibit 5. Permit Modification (Mod) Process for each Class



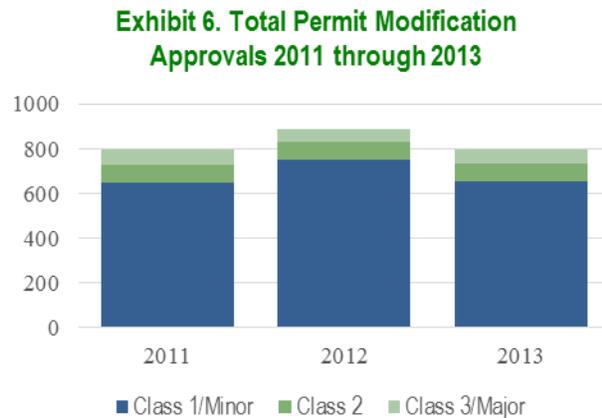
See [40 CFR 270.42](#) for the full federal regulations for permittee mod requests. State regulations may vary. Several states have not adopted the regulations for the three class structure, and use the preexisting Major and Minor Mod structure. * The permitting Agency may need additional information from the facility in order to make a decision and these interactions can be lengthy. The Permitting Agency may also determine that the class should be higher or lower (or decide if a Class 1 needs prior approval) based on the change being made. The separate temporary authorization process can be used for Class 2 or 3 as appropriate (although not referenced in the Class 3 process above).

B. Permit Modification Statistics

This section describes the quantity of permit modification approvals granted during 2011 through 2013 and relates it to additional permitting information.

From 2011 through 2013, regulatory officials approved 2,479 permit modifications. On average, 826 permit modifications were approved each year over the three-year period. Annual breakdown: 794 permit modifications were approved in 2011; 888 in 2012; and 797 in 2013.

This data set does not count permit modifications that were still being assessed at the end of the year and does not count those that were denied or withdrawn. Exhibit 6 shows the relative number by type of these approvals by class and year.



According to a review of a smaller subset of the states that regularly track approvals in EPA's national database, the 2011 through 2013 tallies appear to be a little lower than the average rate. The decrease in number of modification approvals during the 2011-2013 period may coincide with nationwide economic factors, which influenced the need for changes and permit reissuances at permitted facilities.

Data used in the analysis. The permitting programs for each state record the permit modifications that are approved annually.¹² EPA collected these permit modification data for years 2011 through 2013 from state and regional sources for 39 states, the District of Columbia, and three U.S. territories. EPA obtained data for an additional eight states¹³ and Puerto Rico from the Agency's national database when it was identified as the best and most accurate resource. Data for the remaining states (Maryland, New Jersey, and Pennsylvania) were statistically extrapolated based on permitting data.¹⁴ Although there may be gaps in the data due to differences in tracking practices, and underreporting of Class 1 permit modifications, EPA considers these data to be the best available nationally.

Class 1 (or Minor) permit modifications were the most common, representing 83 percent of all approved permit modifications. Class 1 modifications are generally the least substantial type of modification. However, as previously described, in some cases they can be complex and lengthy to process.

Class 2 modifications accounted for approximately 10 percent of total permit modification approvals.

Class 3 modifications impose the greatest burden on regulators and permittees, but account for a significantly smaller percentage (7 percent) of total permit modification approvals. See Exhibit 7 for the

¹² Per 40 CFR 270.42(i), each environmental program Director must maintain a list of all approved modifications and must publish a notice once a year in a state-wide newspaper that the updated list is available for review.

¹³ EPA used RCRAInfo data for the following states: Alabama, Colorado, Georgia, Illinois, Indiana, Nebraska, New York, and South Carolina. Additional states use RCRAInfo to track modifications, but they provided tallies.

¹⁴ Estimates of permit modifications in Maryland, New Jersey, and Pennsylvania were extrapolated based on the national average of permit modifications per permitted facilities. See Appendix 2 for additional details.

distribution of permit modifications by class and for the relationship to permit issuance.¹⁵ Note that this does not include all permit maintenance activities.

Several states (Alabama, Florida, Maine, Minnesota, New York, Ohio, and South Carolina) use the original “major or minor” permit modification categories in lieu of the three class system introduced in a 1988 rule (53 FR 37912). Minor modifications were counted as Class 1’s and major modification were counted as Class 3’s for the national tally.

Permits have different conditions for facilities that are operating or are in post-closure. Permit modifications can make changes for operating or post-closure standards, but there are typically fewer changes needed for facilities that are in post-closure.

The data also show that the number of permit modifications varies by state. On average, 17 permit modifications were approved per state/territory per year between 2011 and 2013.¹⁶ However, the distribution around this average is wide.

Exhibit 7. Permitting Actions 2011 Through 2013

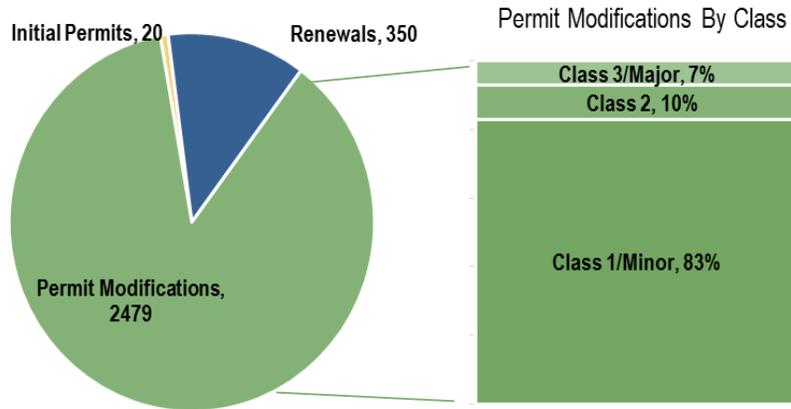
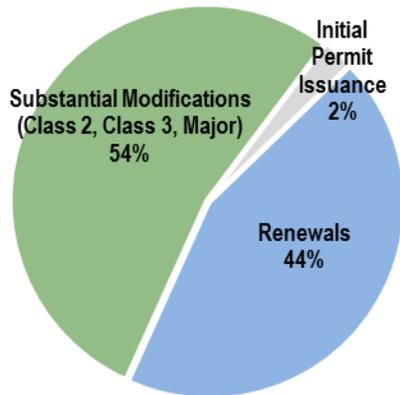


Exhibit 8. Substantial Permit Actions



Permit modifications impose a substantial burden on regulators and permittees relative to permit issuance. The initial permits and reissuances/renewals in 2011 through 2013 were calculated from RCRAInfo data. The data shows that there are far more modifications than permit issuances during this timeframe.

Class 3 modifications (7%) are comparable to initial permit issuance or renewal with regard to public participation requirements. Similarly, some of the substantial (Class 2, 3, Major) permit modifications (17%) can be comparable to permit issuance with regard to the complexity and workload. See Exhibit 8 for the percent of substantial modification approvals (Class 2, 3, Major), initial permits issuance, and permit renewals.

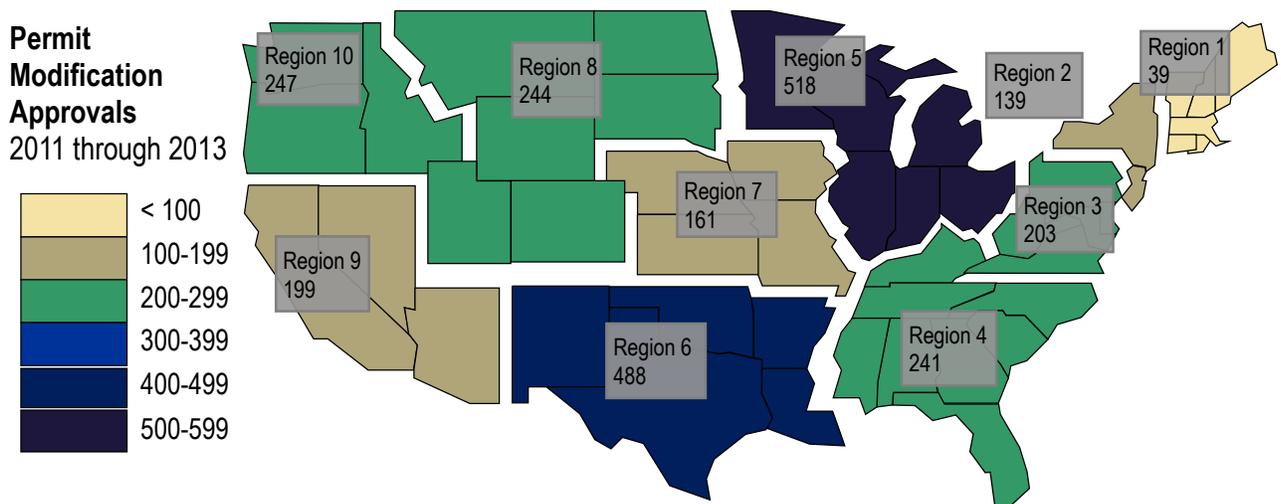
See Appendix 2 for additional details and background information about RCRAInfo and the data.

¹⁵ EPA identified initial permits from RCRAInfo data for the permit determinations that occurred during 2011 through 2013 at a facility with no prior permit determination. The renewals are calculated from the permit issuances 2011 through 2013 that followed an initial permit issuance (prior to 2011).

¹⁶ The calculation of this number does not include data from the District of Columbia, U.S. territories, or any state with no modifications recorded during that timeframe.

Many factors contribute to the differences in modification numbers among states. For example, some states have five-year permit terms versus ten-year permit terms. There is a greater likelihood that the major changes will be incorporated in the permit reissuance if a permit is reissued at shorter intervals (as compared to ten-year intervals). Permit fees on modifications can also sway business decisions regarding permit modifications (for example, the facility operators may delay changes that trigger permit modifications until the permit is renewed). States with more permitted facilities would be expected to have more modifications, but not all permitted facilities modify their permits at the same rate (for example, permitted facilities in post-closure care typically have fewer modifications on average). Exhibit 9 shows the number of permit modifications by EPA region.¹⁷

Exhibit 9. Permit Modification Approvals by Region (2011-2013)



	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
Number of Modifications 2011-2013	39	139	203	241	518	488	161	244	199	247	2479
Permitted Facilities	54	97	134	365	195	262	86	58	134	44	1429
Modifications per Permitted Facilities 2011-2013	0.7	1.4	1.5	0.7	2.7	1.9	1.9	4.2	1.5	5.6	1.7
Annual Modifications Per Permitted Facilities	0.2	0.5	0.5	0.2	0.9	0.6	0.6	1.4	0.5	1.9	0.6

1,429 facilities were permitted as of February 6, 2014. Either the included facilities had an operating permit or post-closure permit (or units with both) based on their specified legal status codes. Facilities were omitted if their operating status codes indicated they would not be eligible for a permit modification. See the criteria in Section III.C.

There is a large range of annual permit modifications at individual facilities. Many states had average numbers of modifications per facility well above or below the national averages. In some cases, a facility may require multiple modifications in a single year; conversely some facilities may tend to save their changes and integrate when the permit is renewed.

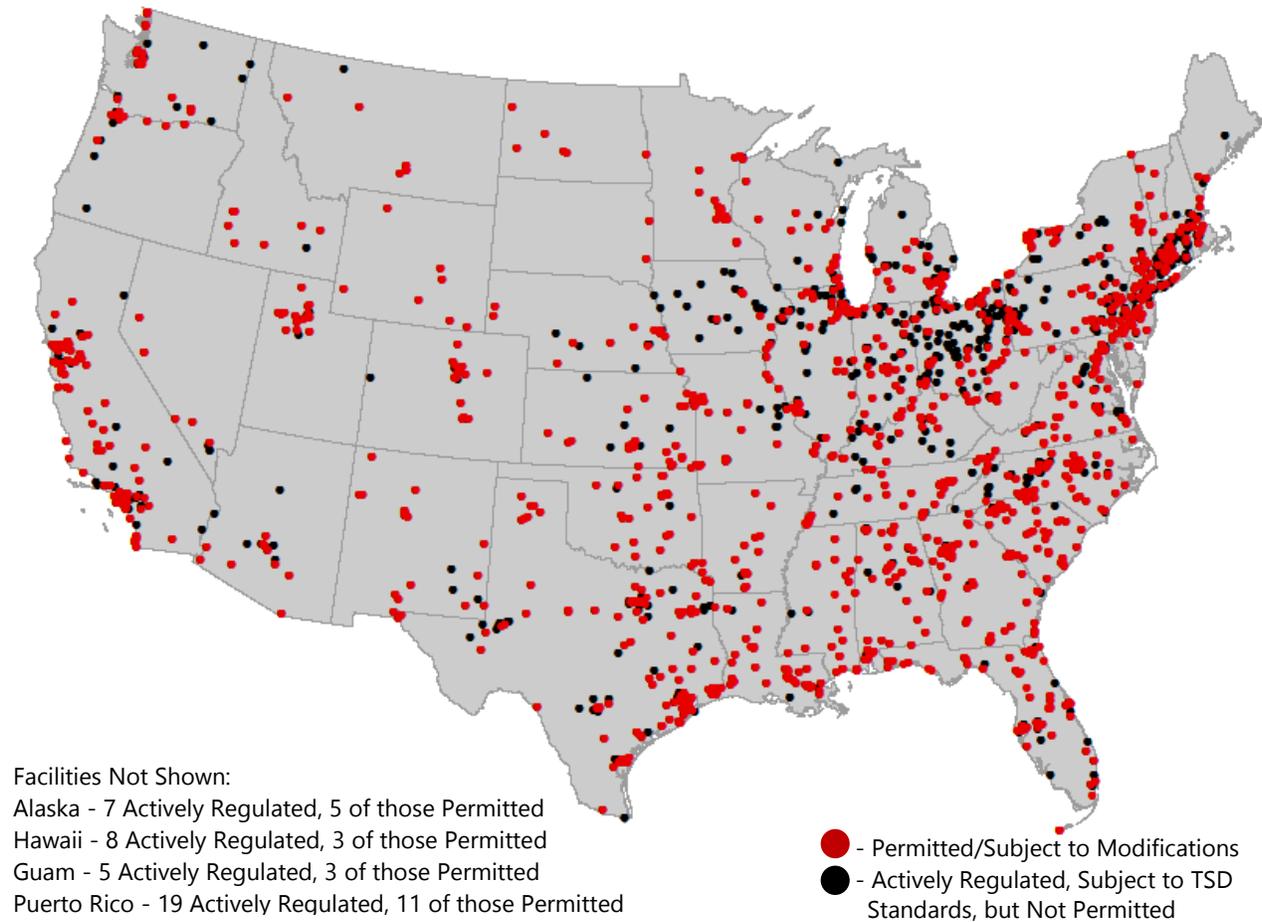
¹⁷ States with fewer permitted facilities may experience more variation in the number of permit modification approvals per year. This represents an additional limitation of the three-year sample of data collected from RCRAInfo.

C. Location of Permitted Facilities with Potential for Modifications

The majority of the “actively regulated” hazardous waste treatment, storage and disposal (TSD) facilities have been permitted.

Exhibit 10 maps the universe of actively regulated TSD facilities. All of the facilities identified below (red and black dots) are subject to the regulations for standards for owners and operators of hazardous waste treatment storage, and disposal facilities and are described in more detail in Appendix 2. The red dots identify facilities that are permitted. Thus, the map shows 1,429 permitted facilities that are expected to eventually need permit maintenance/modifications (this number is calculated for the purposes of this report).¹⁸ The black dots identify actively regulated facilities that are not permitted, such as facilities that are going through closure, but are not yet clean closed.

Exhibit 10. Facilities Permitted and Subject to Modifications, Versus Other Regulated Facilities



¹⁸ According to RCRAInfo, 1,429 facilities (6,245 units) have at least one unit that is permitted (according to the legal status code and not terminated) and does not include facilities where all units are also coded as clean-closed, referred to CERCLA, completed post-closure care, or are coded as conducting activities that do not require a permit (according to operating status codes). If the facilities with those operating statuses were not removed from the count, this would add 400 additional permitted facilities (although generally not active, these permits may require some permit maintenance). Legal and operating status code data as of 10-30-14.

IV. CONCLUDING POINTS

As the majority of facilities that are treating, storing, or disposing of hazardous waste have been issued initial permits under RCRA, the bulk of permitting activity has now *shifted towards maintenance* of those permits. Permitting activity is now geared towards responding to business needs and changes in facility operations while ensuring that the permitted conditions continue to be protective and prevent release. It is critical to keep up with the permit modification workload in order to enable improved business operations, technological upgrades, and expansions while maintaining protection of the environment.

Because RCRA permit modifications are not tracked as part of the Agency's Strategic Plan, this substantial and vital work has gone largely unrecognized. This report thus depicts for the first time the national perspective of permit modification work conducted throughout the country. The unpredictable nature of permit modification complexity, frequency, and timing makes workload balancing and resource allocation difficult to manage. While the workload for the number of modification requests cannot be projected accurately for set goals, the workload is now being recognized in other ways. EPA believes that improved characterization and quantification of permit modifications will enable greater understanding of the importance of effective RCRA programs for EPA, the state agencies, the regulated community, and the public.

In addition, better data and understanding of the permit modification work may uncover barriers, issues, and opportunities for improvement in the permit modification process. EPA remains open to learning how the RCRA permit modification process could be made more efficient and protective.

PART 2

PERMIT MODIFICATION CASE STUDIES

While ensuring protection of human health and the environment is the underlying objective for the permitting standards, there are often business reasons – as well as environmental reasons – that compel companies to request changes to their permits. The following case studies describe real-world examples for the types of changes at facilities that require permit modifications across the country. They also offer a glimpse of the content and process for different permit modifications, while illustrating how changes to permits continue to ensure that proper safeguards remain in place and allow companies to respond to changing business needs or pursue innovative approaches to responsible hazardous waste management.

Permit modifications vary greatly in terms of purpose and complexity. The permit modification case studies are sorted into four broad categories of changes based on their primary outcome: A. Responding to Changing Business Practices or Operations Responding to Business Needs; B. Improving Hazardous Waste Management; C. Ensuring Long-Term Protection; and D. Keeping Permits Up to Date. The table below shows an index for the case studies and their main outcomes. The following sections describe each case study category in more detail.

The examples show a broad range of permit modifications, from very significant actions to reoccurring administrative updates.

Overview of the Permit Modification Case Studies in these Sections

INDEX: Case Study Categories
A. Responding to Changing Business Practices or Operations
1. Improvements in Technological Efficiency
2. Economic Development and New Waste Handling Capacity
3. Ownership Changes
B. Improving Hazardous Waste Management
1. Resource Conservation
2. Reduced Risk of Release and Improved Safety
3. Replacement of Damaged or Aging Equipment
C. Ensuring Long-Term Protection
Closure, Post-Closure Care and Corrective Action
D. Keeping Permits Up to Date
1. Emergency Response
2. Updates to Permit Standards and Conditions
3. Administrative Updates
E. Modifications over the “Life of a Permit”

A. Responding to Changing Business Practices or Operations

INDEX A. Responding to Changing Business Practices or Operations
Case Study Categories
1. Improvements in Technological Efficiency
2. Economic Development and New Waste Handling Capacity
3. Ownership Changes

One common impetus for permit modifications is in response to facilities that want to make changes in their operations due to shifts in the market or other business-related factors. They may plan to adopt more efficient or less costly waste handling procedures, install new technologies, construct new units, change the manufacturing process that results in different wastes managed, use alternate fuel sources, or sell the facility.

As with any permit modifications, *it is the role of the permitting authority to assure that such changes will be protective of human health and the environment.*

Facilities often request these modifications to increase operational efficiency and compliance with permit requirements by adapting to changing conditions and needs. For instance, a permitted remedial system may become less effective over time necessitating a modification of the permit to allow for an improved remedial system. In some cases, remedial systems may be implemented in the midst of a busy production facility and have to allow for compatibility with production operations while maintaining remedial effectiveness.

Replacement of a Monitoring/Withdrawal System with a Barrier Wall

The Axiall Corporation in Lake Charles, Louisiana requested a Class 2 permit modification for the construction of a barrier wall to control horizontal migration of constituents of concern in groundwater into Bayou Verdine, Barge Slip, and the Coon Island Reach to below levels that would cause sediment or surface water to pose an unacceptable risk. This replaces a monitoring and shallow withdrawal system while Axiall continues to operate a Lower Aquitard Containment System. The system will control laterally migrating groundwater until the flow reaches a depth at which it is fully captured by the wells of the Lower Aquitard Containment System. Many technical concerns were raised by the public and were addressed during the modification process. The Louisiana Department of Environmental Quality concluded that the barrier would more effectively control the groundwater flow from the facility to the adjoining water body than the groundwater withdrawal system that was dropping in efficiency.



Outcomes: After the replacement, the overall systems will more efficiently contain the constituents and remove contaminated groundwater at the Lake Charles Chemical Complex in Louisiana. The barrier wall will require less maintenance and operational effort resulting in increased reliability. Fewer resources will be needed to implement this remedy and it will provide greater environmental protection of the surrounding waterbody for long-term care. The public comment process resulted in resolution of certain technical concerns with the approach prior to implementation.

Associated Workload:

- Review/approval of the change request, design plans, construction report, operating and maintenance plan, and annual corrective action reports
- Official public review and comment, and response to comments

A.1. Improvements in Technological Efficiency

After facilities are permitted, they often need to make changes to their waste handling practices in order to stay competitive and to adjust to market demands. In order to make these changes, facilities often need to modify their permits.

Most permitted facilities originally identified their types of equipment and units used to manage hazardous waste in their permit applications in the 1980s. Some of the equipment and processes may now be outdated. Multitudes of technological advances have occurred since the 1980s that can produce environmental benefits (as well as cost savings to the facility).

A number of advances have also been made in the methods to address contamination. See the highlighted Axiall Corp case study for an example of the use of a new barrier wall to control lateral migration. This case study, like many others, also applies to other categories. The changes at Axiall Corp also ensure long-term environmental protection after operations cease (covered in Section C).

New equipment for more efficient waste management

A Clean Harbors facility in North Carolina received temporary authorization (while pursuing a Class 3 permit modification) from the North Carolina Department of Environment and Natural Resources for the installation of a shredder to help separate containers and liquid waste more efficiently, which would in turn offer improved environmental protections. Initially, Clean Harbors requested guidance on installing a new shredder for processing small containers to speed up separation of the liquids and containers in order to improve their waste management practices. The permit writer looked for guidance, consulted counterparts, and found previous EPA determinations that using a shredder was considered treatment in a "miscellaneous unit." The permit writer discussed this with the facility and advised them to submit a permit modification request and to consider the temporary authorization (TA) option for Class 3 modifications. Under 40 CFR 270.42(e)(3)(ii)(E), an allowable objective for issuing a TA is to facilitate changes to protect human health and the environment. The TA request was received, reviewed, and approved. The facility also submitted a permit modification request to add the shredder unit to its hazardous waste management permit.

The shredder unit was installed under the TA. The permit writer and Resident Inspector coordinated a site visit to view the process area and testing of the shredder unit with non-hazardous materials. The permit writer reviewed the requested changes in the permit modification application and requested some clarifications and corrections. Final revisions were submitted by the facility and the permit writer drafted revisions to the permit. The draft permit modification was issued for public comment and a public hearing was held during the 45-day comment period. No comments were received and the final permit modification was issued.

Although the TA process was streamlined relative to the typical Class 3 permit modification process, TA's still require substantial time and effort on the part of the facility and the regulatory agency responsible for review and approval.

Outcomes:

- The facility reduced operating costs with a more efficient process of separating waste from the containers.
- The TA process allowed for quicker implementation of the proposed modification.
- Coordination and technical expertise from the state permitting authority helped the facility

understand how the TA and modification processes could support the facility's desire to improve its waste management practices in a timely manner while ensuring that the new technique would continue to be protective of human health and the environment.

Associated Workload:

- Review/approval of the TA and the modification request. (No comments received).
- Repeated discussions with the facility about the appropriate calculations and appropriate type of modification.
- Public notice and preparation for/participation in public hearing.

Alternative fuel for a cement kiln calciner

Lone Star Industries, Inc. in Cape Girardeau, Missouri, manufactures Portland cement, the active ingredient in concrete. The facility requested a Class 3 permit modification from the Missouri Department of Natural Resources for a new technological solution that would allow it to replace a fossil fuel (coal) with an alternate (hazardous waste) fuel in the facility's calciner, aka indirect kiln. As part of the permit modification process, Lone Star first had to demonstrate the ability of the hazardous waste fuel to meet air emissions standards. The modification request also included updates to the facility's waste codes and a proposal to add two additional railcars and associated storage tanks. This modification enhances Lone Star's ability to meet changing market demands.

The changes at Lone Star also result in resource conservation, which is covered in Section "B. Improving Hazardous Waste Management."

Outcomes:

The use of alternate (hazardous waste) fuel in the calciner:

- Reduced long-term facility operating costs with better technological solutions.
- Reduced the amount of hazardous waste that might otherwise be disposed of in favor of beneficial reuse for energy recovery.
- Conserved and reduced the use of fossil fuels (coal).
- Reduced air emissions as the hazardous waste fuels burn "cleaner" than fossil fuels.

Associated Workload:

- Planning and oversight of demonstration test(s) to prove ability to meet emission standards.
- Review/approval of the modification request.
- Assess any comments from the 60 day public comment period on the request, and the 45-day comment on the draft revised permit and public hearing.

A.2. Economic Development and New Waste Handling Capacity

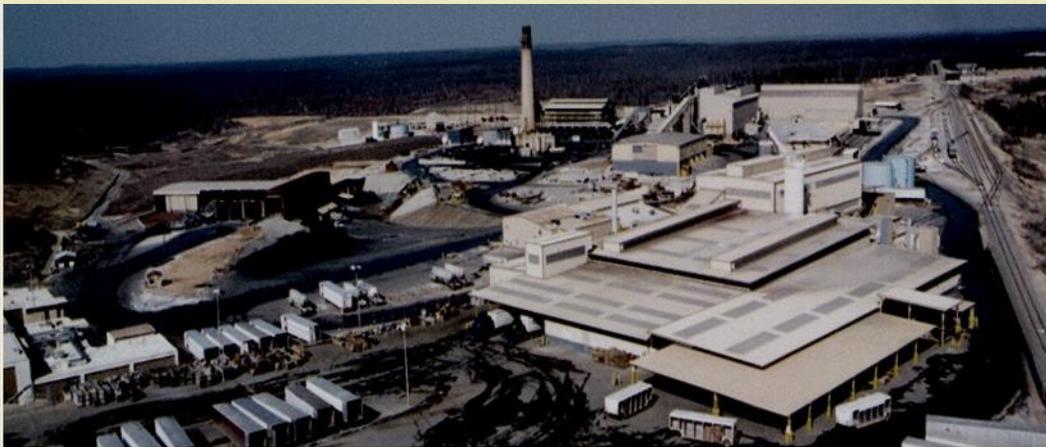
Modification requests by facilities are often in reaction to market changes (i.e., increase/decrease in generation of hazardous wastes or new state/federal hazardous waste). For example, facilities may need additional waste handling capacity, need to treat additional wastes types, need additional units to treat, store, or dispose of wastes, or have other needs in order to meet changing market demands.

Addition of Three New Hazardous Waste Units

The Buick Resource Recycling facility requested a permit modification from the Missouri Department of Natural Resources (DNR) to allow for the construction, operation, closure, and post-closure of a new onsite Subtitle C landfill and two additional hazardous waste containment buildings. This modification was amongst 22 permit modifications that were processed from 2007-2013 as listed on the DNR website: <http://dnr.mo.gov/env/hwp/permits/activepa.htm>.

The Buick Resource Recycling Facility receives lead-acid batteries and other lead-bearing wastes. The wastes are recycled to recover lead and other trace metals. In addition, the facility recycles sulfuric acid from the batteries and the plastic from the battery cases. Prior to the modification, the facility was comprised of two container storage areas, six miscellaneous treatment units, and five containment buildings. Slag generated from the secondary smelting process was previously treated at the facility to meet land disposal restrictions treatment standards and then hauled off-site to a RCRA Subtitle D (solid waste) landfill for disposal. The contiguous facility property is subject to corrective action. The facility's rotary smelter and blast furnace are currently certified for Missouri resource recovery.

Following approval of the Class 3 Permit modification, the new on-site landfill cells were constructed to RCRA Subtitle C (hazardous waste) standards and put into operation to manage secondary smelting slag and gypsum wastes generated at the facility. These standards included a double liner system, leachate detection/collection systems, a groundwater detection monitoring program, and financial assurance for closure and post-closure care of the landfill.



Outcomes:

- Improved long-term economics and reduced operating costs from the new on-site waste storage/disposal capacity (metals recycling process contained on-site; possible future slag reclamation; cost saving for on-site disposal).
- Reduced potential for off-site contamination by eliminating about 98% of waste leaving the site thus reducing spill risks associated with off-site transportation.
- Improved traffic safety and reduced fossil fuel use/air emissions (about 130,000 gallon reduction in diesel fuel use annually) by having 2,500 fewer trucks leaving the facility on an annual basis.
- On-site management of wastes in compliance with RCRA Subtitle C (hazardous waste) requirements as opposed to previous on-site treatment and transportation on public roads to off-site disposal at RCRA Subtitle D (solid waste) landfill resulting in enhanced environmental protection and future liability protection for the Permittee.

Expansion of facility operations without using new green space

The CHS Inc. Laurel Refinery in Laurel, Montana, submitted a request for a Class 2 permit modification to the Montana Department of Environmental Quality (DEQ) to allow closure of a land treatment unit using risk-based closure standards for soil and groundwater. The facility was able to close the unit and reuse the eight-acre area for structures associated with new Coker and Coker Flare units. Restrictions preventing residential use of the area were placed on the property deed.

The facility worked closely with DEQ to expedite the assessment and construction of the new units. Communication between DEQ and CHS was essential to ensure refinery planning needs and all regulatory requirements were met. Timely reviews of documents submitted in support of the modification request, issuance of an environmental assessment, and DEQ's final decision on the request were critical for planning and final implementation of the refinery expansion.

Outcomes:

- CHS expanded its refinery operations using the footprint of the land treatment unit by demonstrating concentrations of hazardous constituents in soil and groundwater met risk-based standards.
- Use of conservative risk-based closure standards and restrictive land use controls can allow for appropriate reuse that is protective of human health and the environment.

Associated Workload:

- Technical review and approval of documents supporting the modification request, closure plan, and closure report and certification for the land treatment unit.
- Development and issuance of environmental assessment for public comment.
- Issuance of final modification determination after consideration of all public comment.

New refinery process unit

Phillips 66 Company had a need for a new refinery process unit. They submitted a Class 3 permit modification request to the Montana Department of Environmental Quality (DEQ) for removal of an asphalt cap on a closed surface impoundment at the Phillips 66 Billings Refinery in Billings, Montana, in order to install a new refinery process unit at that location. Removal of the cap was necessary for remediation and removal of contaminated soil and hazardous waste. All wastes and contaminated vadose zone soils were removed, allowing use of the space for a new refinery process unit. Removal of the contaminated soil and waste reduced the risk of future contaminant exposure to industrial workers and potential leaching of hazardous constituents to groundwater.

Outcomes:

- The subject area was remediated and was able to be reused.
- Environmental protection was enhanced.

Expansion of treatment capacity for mixed waste

The Perma-Fix Northwest facility in Richland, Washington, requested a Class 3 permit modification from the Washington State Department of Ecology to expand treatment capacity for mixed waste (a waste that contains a hazardous waste component and a radioactive material component) and to install a new evaporation system. The permit modification was to allow for the following: the installation of two new evaporator units, increased tank storage capacity, and storage of mixed waste in tanker trucks. It also clarified language to align the permit with current practices. Further processes would stabilize residue. An older gasification/vitrification system was also to be replaced via the permit modification.

Outcomes:

- The installation of new units and changes in waste handling procedures would have allowed the facility, which provides industrial and nuclear-waste management services, to expand its ability to treat and manage mixed wastes, but this specific upgrade was no longer pursued after the facility was informed of additional assessments needed. The upgrades need to be able to show that they continue to be protective (i.e., demonstrate the effectiveness for treating the wastewater streams).

Associated Workload:

- A great deal of assessment goes into modifications that are not eventually approved. Technical review of documents supporting the modification request led to a determination that the request was incomplete and a notice of incompleteness was issued to Perma-Fix Northwest. The modification was missing a thermal risk assessment work plan, demonstration test, and information on the proposed wastewater streams proposed to be treated in the evaporation systems.
- Perma-Fix requested that the permit modification be rescinded after the letter of incompleteness was issued.

A.3. Ownership Changes

Permitted facilities are often purchased by or merged with other companies. This tends to lead to requests for “urgent” permit modifications for changes of ownership and/or operational control of the facility. In order to ensure that the environment continues to be protected after an ownership or operational control transfer, the permitting agency must ensure that the new owner or operator provides financial assurance in a timely manner and that the amount of financial assurance is sufficient to cover future closure or post-closure at the facility. *This is essential for long-term environmental protection.*

As mentioned in the accompanying case study below, many facilities have difficulty in following the regulatory requirements and time frames to notify the permitting authorities regarding the planned ownership transfers and to have financial assurance. This makes it difficult for permitting authorities to process the information and ensure that the new facility owner or operator is compliant with the applicable regulatory requirements including those related to financial assurance. Permit modifications for changes of ownership or operational control can be relatively straightforward; however, this type of modification can become complicated and lengthy, particularly as compared to other Class 1 type of modifications. Substantial agency resources are often needed to review and approve these types of modifications since, in large part, they typically require submission of information that facilities did not anticipate. Agency enforcement actions may be initiated due to a facility’s failure to follow the regulations and/or permit requirements related to changes of ownership or operational control. This further extends the timeline.

In some situations, only parcels of land are sold, not the whole facility. For example, facilities may request permit modifications in order to transfer ownership of portions of property that are part of a RCRA regulated facility but have been fully remediated (or were never contaminated). When land is removed from the jurisdiction of a permit (parceled) via a permit modification, close coordination of permit writers and corrective action (remedial) project managers is needed to ensure that it is appropriate to remove any land from the permit jurisdiction. The preparation to assess the parcel also involves coordination with the facility regarding any additional analyses or actions (e.g., property legal surveys) that need to be conducted relative to the property proposed for parceling.

One state has found in their experience that Class 1 modifications that involve changes in ownership and/or operational control usually take much longer than 100 hours (the high end of ASTSWMO's calculated range previously mentioned), especially with complex facilities that only transfer/sell the active portions but retain portions that require corrective action and post-closure care (all under one permit).¹⁹

This situation at times requires a new permit for owners/operators that do not already have a permit.

The need for prior financial assurance approval is frequently overlooked in new ownership cases and results in application processing complications and increased timeframes. The workload includes technical review of the financial assurance mechanism and determination that the new operator has provided documentation to show sufficient financial resources to operate and to eventually close the facility in compliance with the permit.

Modifications are further complicated if they involve more than one company that own different parts of the property the property is under one permit.

Complexities in Ownership Change and Financial Assurance

The Detrex Corporation in Charlotte North Carolina transferred facility ownership and environmental liabilities to Trex Properties, LLC. This case study shows how a seemingly simple Class 1 can be complex and require substantial agency resources to review and approve.

When the Detrex Corporation announced its intent to transfer facility ownership and environmental liabilities to Trex Properties LLC, the North Carolina Department of Environment and Natural Resources (NCDENR) reminded Detrex of the requirement to submit a Class 1 permit modification request at least 90 days prior to the transfer. Regardless, the modification request was not received by NCDENR until nearly a month after the property transfer. When the modification request was submitted, it was substantially incomplete; most notably the facility had yet to submit financial assurance for Corrective Action. NCDENR issued a Notice of Deficiency for the modification request, requiring the companies to submit all information required for the transfer and to meet all outstanding compliance obligations before the agency would process the modification.

The modification process in this case spanned five months, in part due to disagreement about the amount of financial assurance required. Because Detrex had not supplied an estimate of corrective action costs as required by NCDENR, the state agency set the financial assurance amount at \$1.2 million. Trex requested to supply an engineering affidavit in place of the required corrective action strategic remedy, but NCDENR and the state Attorney General's Office determined that an affidavit would not be sufficient. Ultimately, Trex funded the required \$1.2 million, and the permit modification was approved. This Class 1 modification encountered additional complexity, but is too detailed to include.



Outcomes: Although the permit modification process in this case was lengthy and required substantial agency resources, critical compliance issues were addressed before the modification was approved. Ultimately, the permit modification supported long-term environmental protection (by ensuring funding for closure and any needed cleanup of contamination) while also facilitating administrative updates.

Associated Workload:

- Assessment of the liability coverage, legal boundaries, basic facility information, compliance information.
- Development of a full remedial strategy,
- Cost estimation for remediation, and related financial assurance.

¹⁹ Communication with the Waste Permits Division of the Texas Commission on Environmental Quality 10-23-15.

B. Improving Hazardous Waste Management

As hazardous waste management evolves, facilities often need to make changes to better protect the environment while treating, storing, and disposing of hazardous waste. The changes addressed in these permit modifications included the adoption of new methods of environmental protection, waste reduction, resource conservation, construction of onsite units to avoid offsite impacts, reducing risk of release, compliance with environmental standards, and other benefits for environmental protection that reduce risks to human health and the environment. In general, “green” permit modifications not only improve the environment, they may also improve operational efficiencies and economic development in the long run.

INDEX B. Improving Hazardous Waste Management
Case Study Categories
1. Resource Conservation
2. Reduced Risk of Release and Improved Safety
3. Replacement of Damaged or Aging Equipment

B.1. Resource Conservation

One of RCRA’s primary objectives is to conserve valuable material and energy resources. There have been many improvements to waste management activities over time that improve efficiency of processes and thus contribute to this goal. In addition, facilities also often find cost savings when employing these types of improvements to their operations.

Operational change to treat hazardous waste-contaminated metal

A hazardous waste burning cement kiln located at a facility in Missouri has a scrap metal waste stream from crushed and shredded drums. Prior to its permit being modified, this was the only waste stream that continued to be sent off-site for disposal as a hazardous waste since there was simply too much hazardous waste residue on the metal for it to be recycled as scrap. The facility initially explored several methods for cleaning the metal to remove enough of the hazardous waste residue so that it could be recycled.

After initial exploration of various metal cleaning methods, the facility requested (and the Missouri Department of Natural Resources approved) a Class 3 Modification to build a gasifier unit in order to clean the metal (gasify the residuals on the metal). This would create gas that the facility could use as supplemental fuel to fire their hazardous waste burning cement kiln and render the metal, after post-gasification rinsing, clean enough that it could be recycled as a non-hazardous material as opposed to being disposed of off-site as a hazardous waste.

The facility adapted the gasifier technology from another industry for this modification and set about constructing and pilot testing the operation. Several technical issues had to be assessed and overcome during the pilot-testing phase. Ultimately, while the process was successful in cleaning the metal to the degree necessary for recycling, the gas production rates and volume of metals that could be processed were not consistent with the original design projections. As a result, this process has not yet been put into full operation and it is unknown if the limitations identified during pilot testing can be overcome to the

extent necessary to support full operation. Nevertheless, this permit modification allowed for research, development, and demonstration of a novel approach to metal decontamination that resulted in an end product that could be recycled and that created supplemental fuel to fire the cement kiln.

Outcomes:

- Encouraged innovation and research, development and demonstrations of a novel approach to cleaning metal so that it could be recycled as metal scrap instead of being sent for off-site disposal as a hazardous waste.
- If technical issues can be overcome, the hazardous waste generation at this facility can be eliminated and large volumes of clean scrap metal can be recycled/put back into productive use.

Associated Workload:

- Technical review and approval of documents supporting the modification request, closure plan.
- Assess any comments from the 60 day public comment period on the request, and the 45 day comment on the draft revised permit and public hearing.

B.2. Reduced Risk of Release and Improved Safety

Hazardous waste management standards are designed to prevent the release of hazardous wastes. Changes are often made via permit modifications to improve waste handling practices and further reduce the risk of releases to the environment. Other changes are made to specifically address safety concerns.

Improvements to hazardous waste handling can also be triggered by other environmental requirements. In particular, recent air pollution control regulations have driven environmental improvements to the management of certain hazardous wastes. See the highlighted case study.

Material and waste management requirements not governed by RCRA can sometimes trigger RCRA permit modifications. A case study in another section (Section D.2.) shows how the addition of non-RCRA tanks triggered the need for a RCRA permit modification (since it could influence the secondary containment needed for RCRA waste).

Fire detection and prevention

A fire occurred at the Stericycle Tacoma facility in Washington that caused the re-examination of current permitted procedures. The permit was modified by the Washington State Department of Ecology to include new requirements to reduce the likelihood of a future fire at Stericycle Tacoma during flammable liquid pump-up operations, including the installation of new lower explosive limit monitors. In addition, new pump-up procedures were instituted at this facility.

Outcome:

- Reduced risk of fires and better detection of potentially dangerous conditions.

Supported Compliance with Ambient Air Quality Standards for Lead

The Quemetco facility in Industry, California recycles batteries. The Battery Wrecker Process Area at this facility includes several permitted units, including the facility's battery wrecker, multiple tanks, and a clarifier. In March 2010, Quemetco submitted a request for a Class 1 permit modification to construct an enclosure around the Battery Wrecker Process Area to California's Department of Toxic Substance Control (DTSC).

The enclosure was necessary for Quemetco to comply with a new EPA standard for lead in ambient air and with local air quality regulations for Large Lead-Acid Battery Recyclers. Construction of the enclosure would capture fugitive lead dust emissions from the battery wrecker process. The permit modification would not affect the type or quantity of lead-acid or batteries recycled at the facility.

As part of the permit modification process, Quemetco was required to submit a copy of its financial assurance for closure of the Battery Wrecker Process Area Enclosure within 60 days of the modification approval. The process also required Quemetco to send a notice of the modification to all contacts on the facility's mailing list and the appropriate state and local government contacts. The modification was approved in November 2010.



Outcome: Reduction in the amount of lead in the ambient air and compliance with new air regulations.

Relocation of hazardous waste handling from dense urban area to an industrial area

A commercial waste treatment facility commenced operation in 1980 in what was, at that time, a rural area in the state of Washington. Over time, residential and other commercial land uses in the immediate vicinity of the facility have greatly increased. A permit modification by the Washington State Department of Ecology at the Stericycle Kent facility transferred a significant portion of the waste handling (free liquid pump-up operations and shredding of RCRA wastes) to another facility located in an industrial area away from more populated areas.

Outcomes:

- Reduced risk to the populated urban area.
- Responded to local community concerns and urban encroachment issues.

Enclosed lead smelting structures due to changes in the air regulations

Recent air regulations were applied to the secondary lead smelters that required that the storage of lead containing materials/wastes be totally enclosed. The air regulations required that materials/wastes being stored prior to re-smelting be managed in enclosed containment structures under negative air pressure. Containment structures/buildings necessary to meet the air requirements had to be constructed in accordance with the RCRA containment building regulations. This necessitated issuance of temporary authorizations and permit modifications by the Missouri Department of Natural Resources to facilitate construction completion by deadlines associated with the air regulations. The new structures better prevent releases to the environment and, in many cases, replaced outdoor storage of lead-bearing materials.

Outcomes:

- Improved environmental conditions for ambient air quality by reducing the amount of lead in the ambient air.
- Diminished the potential for airborne lead to be deposited and accumulated on the land and in nearby water bodies, which in turn, protected nearby populations and diminished the potential need for corrective action investigation and remediation.

B.3. Replacement of Damaged or Aging Equipment

As equipment to manage hazardous waste ages, it needs to be periodically replaced. The equipment can eventually show signs of corrosion from the natural elements and from "wear and tear." This equipment must be routinely inspected, maintained, and replaced as necessary to minimize the potential for releases of hazardous waste to the environment.

Replacement of New Equipment

A Class 2 permit modification was requested for the replacement of old sink/float tanks with new washers at the Quemetco facility in Industry, California. This was approved by California's Department of Toxic Substance Control (DTSC). The replacement of aging sink/float tanks normally requires a permit modification and is necessary to minimize the potential for ensuring the appropriate washing separation of hazardous waste from the other materials to protect the quality of the finished recyclable products. The plastic from the battery casings crushing operation are later recycled into paint cans.

Outcomes:

- Prevention of leaks or other releases by replacing old tanks with new tanks.
- Improvement of air quality by ensuring that less lead is attached to the plastic components of batteries prior to smelting
- Increase of the quality of finished recyclable products by reducing the lead components of the recyclable products.

C. Ensuring Long-Term Protection

Hazardous waste permits (and other regulatory instruments) have requirements for facilities to: (1) update closure or post-closure plans and financial assurance instruments/amounts to address future long-term environmental obligations; (2) conduct corrective action to address historical releases to the environment; and (3) provide notification of and address, as appropriate, any new releases and/or discovery of previously unidentified releases. This section discusses the different modifications used to address those issues.

INDEX C. Ensuring Long-Term Protection
Case Study Categories
Closure, Post-Closure Care and Corrective Action

Closure, Post-Closure Care, and Corrective Action

This category includes updates to closure and post-closure plans and selection of final remedies for corrective action.

Compliance with the closure and post-closure plans ensure that the environment will be protected long after the facility closes its permitted hazardous waste management units. If facilities do not clean close their unit(s), they will need to comply with standards for units closed with waste in place, including providing post-closure care. Additionally, RCRA permits must include requirements for facility-wide corrective action to address releases of hazardous waste and constituents. Certain key stages of the corrective action process (e.g., final remedy selection and implementation) often require modification of the permit to incorporate requirements into the permit, because they are frequently not identified at the time of permit issuance. The modification procedures involve public review and comment on proposed final remedy actions.

Cleanup and final remedy selection

The U.S. Army Redstone Arsenal (the Arsenal) located in Huntsville, Alabama, requested a permit modification for numerous changes that included: (1) the addition of a new permittee; (2) removal of seven solid waste management units (SWMUs) from a list of units needing investigation; (3) addition of two SWMUs that require investigation; and, (4) the removal of three SWMUs from a table specifying that corrective measures are needed. The new operator of the permitted open burn/open detonation areas of the Arsenal needed to be included as an additional permittee in order to better define the responsibilities of the onsite entities. This permit modification by the Alabama Department of Environmental Management also included the incorporation of the selected remedies to reduce contamination at six SWMUs within the Arsenal.

The permit modification requests with the completed investigation reports were included in the corrective measures implementation (CMI) plans for the respective SWMUs. The associated investigations were completed in about a year and area specific conditions of these units, from the CMI work plans, were added to the permit. These area specific conditions included summaries of the remedy, any land use restrictions for the site, and any long-term monitoring and maintenance activities required.

This addition to the permit of two new SWMUs that require investigation required the submittal of a SWMU assessment report. These modifications were needed for the areas to be properly investigated.

Outcomes:

- By adding a new permittee, the responsibilities were better defined, including a requirement to comply with submittal dates and schedules of compliance.
- Final remedy selection for 6 units was approved that resulted in the excavation and removal of contaminated soil and reduction/elimination of groundwater contamination sources.
- The selected remedies included the excavation and offsite disposal of about 2,870 cubic yards of perchlorate-contaminated soil, 45 cubic yards of TCE-contaminated soil and about 42 cubic yards of soil contaminated with benzo(a)pyrene and dibenz(a,h)anthracene.

Associated Workload:

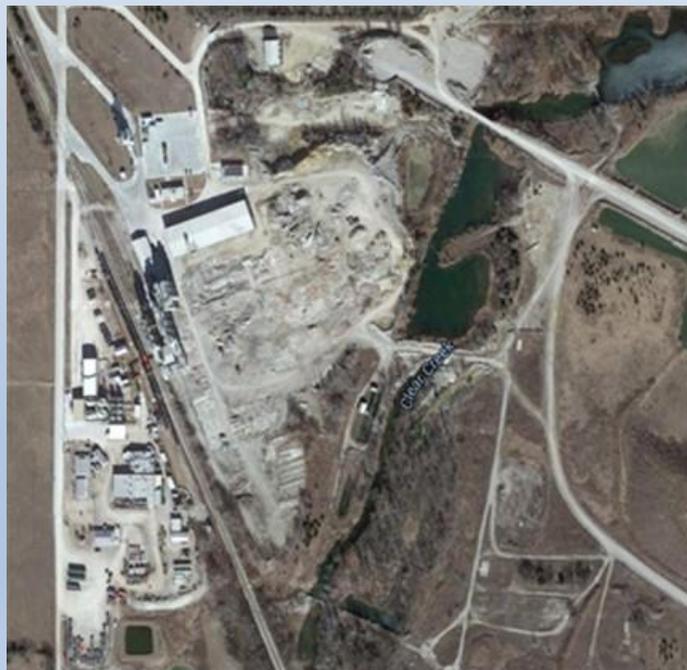
- To complete this modification, several documents had to be reviewed: correspondence letters, RCRA Facility Investigation Reports, CMI work plans and SWMU assessment reports.
- Comment letters and notice of deficiencies were prepared to highlight missing information and to request clarity regarding the Army's submissions. Revised documents were submitted to the Alabama

Final Remedy Selection for Corrective Action\EPA Joint Permit

A final remedy selection for corrective action was approved as a Class 3 permit modification for Lafarge in Fredonia, Kansas. EPA Region 7 processed the modification in 2013 under the EPA portion of the permit (because Kansas was not authorized for corrective action in 2013).

Three solid waste management units were used for on-site cement kiln dust repositories and they contain elevated levels of heavy metals and volatile organic compounds. The investigation of the units identified a threat to the following if left unaddressed: direct contact, groundwater, and ecological receptors.

The selected remedy for each unit is capping with soil and vegetative cover, perpetual cap maintenance, groundwater monitoring, and institutional controls restricting cap disturbance and residential land use in the future.



Outcomes: Improved long-term environmental and human health protection. Reduced risk of release of the heavy metals and volatile organic compounds.

Department of Environmental Management for review.

- After the Department concurred with the Army's various documents, the permit was opened for modification. While incorporating the information and modifications described above, all references to those particular sections throughout the permit were checked for accuracy and modified where necessary to ensure proper reference.
- The draft permit was placed on public notice and no comments were received.

Addition of a risk management plan

The Occidental Chemical Company requested a Class 3 permit modification for its Geismar, Louisiana, facility to incorporate a Risk Management Plan as part of the final remedy being implemented under their post-closure permit. Financial assurance was put in place as part of this permit modification to ensure that there is funding to address contamination through corrective action.

The RMP includes beneficial reuse provisions for on-site soils that meet Risk Evaluation/Corrective Action Program (RECAP) soil standards. This is a common beneficial reuse practice that allows the facility to save money by not having to purchase additional soil for on-site use, or having to pay for disposal of certain soils as long as they meet the RECAP standards. The Louisiana Department of Environmental Quality approved this request.

Outcomes:

- The Risk Management Plan specified the corrective action final remedy and ensured the continuation of standards for protection of environmental quality after unit closure.
- Financial assurance was put in place for future corrective action activities to ensure funds will be available to conduct those activities even if the facility should experience financial difficulty or insolvency.
- The Risk Management Plan provides for beneficial reuse of soils on-site and cost savings for the facility.

Associated Workload:

- Public participation for this Class 3 modification included review and response to comments from the following: the required a pre-application public meeting with the, 60-day public comment period for the application, then a 45-day public comment period for the actual draft permit modification decision to be made.
- This modification required technical review by both a permit writer and geologist in order to make the final permit revisions.

Comprehensive risk reassessment, NPL-listing avoidance, and further investigation in support of an updated final remedy and facility property reuse/redevelopment

The National Nuclear Security Administration at the Bannister Federal Complex in Kansas City, Missouri, requested a Class 3 permit modification to add adjacent, previously unpermitted U.S. General Services Administration (GSA) property to their existing Hazardous Waste Management Facility Part I and EPA Hazardous and Solid Waste Amendments Part II Permits. This was intended to facilitate performance of a holistic environmental reassessment of the combined property in light of the pending move of the National Nuclear Security Administration and GSA personnel to new work locations. The modification was also needed to implement further remediation and potential near-term transfer of a portion of the permitted property to a private entity for subsequent reuse/redevelopment. This modification also served to keep the facility from being proposed for listing on the Superfund National Priorities List (NPL).

This modification to the permit by Missouri Department of Natural Resources was inherently complex since there were/are multiple owners/operators (including a new owner/operator being added), many prior uses of the land by many past owners that led to contaminant releases (primarily chlorinated solvents, polychlorinated biphenyls and petroleum hydrocarbons). A "Formerly Used Defense Site" located on the "annexed" GSA property is being handled by the U.S. Army Corps of Engineers and there is a great deal of public and political interest in the cleanup, disposition, and redevelopment of this aging (over 70 year old) federal complex.

Outcomes:

- Permit modification elements related to groundwater and the updated plan have been implemented. The other elements are in various stages of the review and approval process.
- There are weekly coordination calls on this project between the Department and EPA and monthly coordination meetings among all project stakeholders including the preferred private developer.
- In addition to the activities required of the current permittees by the permit modification, the preferred developer is in the process of:
 - Performing confirmatory due diligence investigations to independently assess environmental conditions.
 - Assessing updated final remedies in light of anticipated future reuse/redevelopment of the property.
 - Assessing the associated future costs as the basis for financial assurance needed to facilitate the early dirty (negative equity) transfer of this federal property to the private developer and thereafter ensure adequate financial assurance is provided for post-closure care and corrective action after the permit is transferred.

Associated Workload:

The primary permit modification elements included the following:

- Implementation of a groundwater remedy optimization plan and revised groundwater sampling and analysis plan to incorporate new wells on the "annexed" property,
- Implementation of updated groundwater analysis and reporting requirements,
- Revision and implementation of an updated Community Involvement Plan (CIP),
- Update the conceptual site model and identify any data gaps that required further investigation given the land area added to the permitted facility (Missouri DNR submitted a facility-wide report: "Description of Current Conditions Report and Screening Level Risk Assessment"), and
- Assessed a facility-wide polychlorinated biphenyl (PCB) fate and transport study in order to inform the permit modification decision.

Soil and groundwater sampling requirements in closure plan

The Aerojet facility, in Rancho Cordova California, requested a Class 2 permit modification in order to update the soil and groundwater sampling requirements in the closure plan. The closure plan revisions included additional sampling and analysis in order to further investigate the underlying soils. The closure plan also included changes in the closure cost estimate. California's Department of Toxic Substance Control assessed the permit modification request.

Outcomes:

- The vertical and lateral extent of perchlorate contamination in soils and the impact of perchlorate to the water table were identified.
- The results were used to determine if the unit could be clean closed or would need to be addressed through post-closure requirements.

Associated Workload:

- Public notice and preparation for/participation in public meetings.
- Assess groundwater reports and follow up on them.
- Financial assurance assessment.

Remediated Area for the Construction of New Warehouse

Loveland Products, Inc. (LPI), in Billings, Montana, requested a permit modification to change post-closure care and corrective action requirements for a closed surface impoundment. The existing permit requirements limited use of the space occupied by the surface impoundment and presented geotechnical problems for construction of a new warehouse. A permit modification was necessary to allow removal of the asphalt cap and excavation and shipment of the enclosed waste to an off-site permitted hazardous waste landfill. LPI requested a temporary authorization to allow excavation work to begin while permit modification procedures were being conducted. DEQ granted the authorization following public notice to all persons on the facility mailing list and to appropriate units of state and local governments. The temporary authorization allowed excavation and shipment of the waste to be accomplished during Montana's short construction season, avoiding environmental and human health exposure issues associated with excavations left open through the winter months.

Approximately 12,000 tons of hazardous waste and contaminated vadose zone soil was removed from the surface impoundment and disposed in a permitted hazardous waste landfill. The hardcover cap, originally installed to protect industrial workers and groundwater, is no longer required. LPI was able to construct a warehouse in the area, reusing space within the footprint of its facility.



Outcome: The modification demonstrates that regulated hazardous waste units can be remediated and the area reused. All wastes and contaminated vadose zone soil were removed from the surface impoundment area to make the area safe for construction and reuse.

Coordination, timing, and complexity: This permit modification was multi-faceted, requiring coordination between the Montana Department of Environmental Quality, the facility, EPA, and the state environmental contact for the facility receiving the excavated waste. Meetings to discuss the project were held several years prior to implementation. Timely review and approval of the modification request was necessary and important to accommodate the planned construction schedule.

The permit modification was complex; it involved a shortening of the post-closure care period, a change in the approved remedy, a determination of Corrective Action Management Unit eligibility, temporary authorization, and final modification approval. The modified remedy required extensive understanding of the requirements needed to address waste disposal.

D. Keeping Permits Up to Date

Permit modifications are often required for straightforward updates to align the permit with current conditions and operations at facilities. It is important for the permit to reflect the current facility information, provisions, and standards in the event that emergency situations arise. This also facilitates appropriate facility inspections by state and federal regulators.

One common type of permit modification relates to changes to the “General Permit Provisions” and “General Facility Standards” as outlined in 40 CFR 270.42 Appendix I. These updates are generally Class 1 modifications (some of these Class 1 modifications need prior Director’s approval).

Many of these changes are administrative updates. Some of these are needed for emergency response (including changes to facility contacts), waste sampling changes, and other changes needed to keep the permit current and compliant.

INDEX D. Keeping Permits Up to Date
1. Emergency Response
2. Updates to Permit Standards and Conditions
3. Administrative Updates

D.1. Emergency Response

It is important to have current safety and emergency response information available and related equipment ready in the event there is a fire, spill, or other emergency at a permitted facility. There are permit modifications that owners and operators of permitted facilities must propose when certain changes are made at the facility. These changes include things such as updated emergency/contingency plans, emergency contacts, and emergency equipment. In addition, EPA has continued to emphasize the “Preparedness and Prevention Requirements for RCRA TSDFs” including ongoing communication and coordination with State Emergency Response Commissions, Local Emergency Planning Committees, local fire departments, and other state and local emergency response authorities, as appropriate.²⁰

Coordination of emergency services, emergency contacts, and other updates

Rho-Chem LLC implemented a Class 1 permit modification to update facility information in the contingency plan. This included the following updates: the coordination of emergency services, spill control equipment, artificial night lighting, compliance history, and emergency coordinator (including alternates). This facility in Inglewood, California worked with California’s Department of Toxic Substance Control on the permit modification. Public notices were sent as required by the regulations to state and local agencies and the mailing list within seven days of implementing the changes.

²⁰ A March 5, 2010 EPA memo was sent from Matt Hale to the EPA RCRA Directors on “Preparedness and Prevention Requirements for RCRA TSDFs (Response to Chemical Safety Board Recommendation 2007-01-I-NC).” The memo states that “this guidance recommends that the TSDF permit explicitly require that the owners and operators provide up-to-date written information about the facility and hazardous waste located there to State Emergency Response Commissions (SERCs), Local Emergency Planning Committees (LEPCs), local fire departments, and other state and local emergency response authorities, as appropriate.” This guidance was also communicated to state programs through ASTSWMO.

Outcomes:

- Changes were made to update important safety/emergency response information at the facility.
- The regulators and public were notified of those changes to help facilitate timely coordination of emergency services and deployment of emergency equipment in the event of an emergency response.

D.2. Updates to Permit Standards and Conditions

The conditions governing management of hazardous waste in treatment, storage, and disposal units are specified in facility permits. Minor changes at any unit (or general facility standards) may trigger permit modifications. Seemingly simple Class 1 modifications can, after review by regulators, require substantial time and effort on the part of both regulators and permittees to complete. Sometimes proposed permit modifications are initially misclassified (i.e., a Class 1 modification request comes in from the facility but is determined by the regulatory agency to actually be a Class 2 or 3 modification). A great deal of the coordination with facilities often takes place before a complete permit modification request is even submitted. In addition, some permit modifications are actually precipitated by changes to requirements of other non-RCRA regulatory programs. A case study is described below how a non-hazardous unit addition could trigger a RCRA permit modification for secondary containment.

Addition of a Non-RCRA regulated tank to the secondary containment area for a RCRA regulated tank

A facility submitted a modification on October 30, 2013, to increase the capacity of their secondary containment for their tank farm. The increase was requested because they were replacing one non-RCRA regulated tank with two non-RCRA regulated tanks and the RCRA secondary containment volume requirements could be affected. The facility proposed raising the secondary containment wall with four-inch angle iron.

In order for North Carolina Department of Environment and Natural Resources (NCDENR) to assess the proposed modification, the facility needed to submit the following additional information: new permit-related drawings; inspection procedures; updates to the secondary containment volume calculations; angle iron installation specifications; and information regarding use of secondary containment sealants and inspection details for the altered secondary containment.

NCDENR and the facility had multiple discussions on the proposed changes to resolve issues so that the agency could begin processing the request. These discussions included helping the facility with the secondary containment calculations and requests for additional information. Because of the technical assistance provided by NCDENR, the facility ultimately determined that the angle iron extension was not needed as the secondary containment calculations contained an incorrect assumption regarding the shape of the bottoms of the new tanks. The existing secondary containment volume was sufficient since the new tanks had spherical bottoms and NCDENR agreed that a Class 2 modification was not needed to increase the secondary containment capacity, though a Class 1 modification was still needed for the changes. A revised permit modification request was submitted in December 2013 and the Class 1 modification was approved by NCDENR in May 2014.

Outcomes:

- NCDENR provided significant technical assistance to the facility to address issues associated with their proposed Class 2 permit modification to add new tanks.

- NCDENR determined that the facility's secondary containment calculations showed that the existing secondary containment volume was sufficient and thus the proposed changes would require a Class 1 permit modification with prior Director's approval in lieu of the proposed Class 2 modification.

Keeping the facility information updated in the permit

The HGST, Inc., facility in San Jose, California, requested several Class 1 permit modifications over a short period of time and all necessitated individual notices to the mailing list. The modifications included the following: (1) revised closure plan for three tanks including clarification of decontamination procedures and connecting piping system; (2) revised closure plan for seven tanks including clarification of the decontamination procedures for new equipment used to manage waste; (3) installation of tie in valves to improve the support and transfer function of a heavy metal waste pipeline; (4) owner's, operator's and facility name change from Hitachi Global Storage Technologies Inc. to HGST Inc.; and (5) administrative changes to update the inspection checklist for units and update training plan job titles. The permitting agency, California's Department of Toxic Substance Control, processed the permit modifications.

Outcomes:

- Closure decontamination procedures were clarified and improvements were implemented to the support and transfer of a portion of the waste handled.
- The permit and related documents was updated to reflect current information, including current facility owner/operator information.

Replace hazardous waste storage unit containers with ones of a different type and size

This Class 2 permit modification request from Rho-Chem LLC resulted in replacement of certain hazardous waste storage unit containers with others of a different type and size but did not increase the storage capacity at the facility. California's Department of Toxic Substance Control modified the permit.

Outcome:

- Replacement of hazardous waste storage container units with different types that were better suited for the ongoing operations at the facility.

D.3. Administrative Updates

Permit modifications are often requested for administrative or informational purposes that are not related to physical improvements that need to occur at the facility. Although informational changes are typically simple and straightforward, they can require a surprising level of administrative effort from permittees and regulatory officials. For example, facility name changes are common and often trigger substantial additional review effort on the part of regulatory officials to confirm that the name change does not stem from a change in facility ownership or operational control, which would require updates to financial assurance or other compliance mechanisms.

Facility Name Change

In 2014, Evoqua Water Technologies LLC requested a Class 1 permit modification for its hazardous waste management facility in Vernon, California, to change the name of the owner and operator from "Siemens Water Technologies LLC" to "Evoqua Water Technologies, LLC." This is a common modification and seemingly easy, but as part of the modification process, Evoqua was required to notify all contacts on the facility's mailing list and the appropriate state and local agencies of the name change. California's Department of Toxic Substance Control permitting staff also had to review the request to ensure that it was not an ownership change and that the current financial assurance was adequate.

Outcomes:

- The permit and related documents were updated to reflect the new owner.
- Financial assurance was reviewed and confirmed as still viable/applicable.

Extend closure period due to funding delays

The National Aeronautics and Space Administration (NASA) in New Orleans, Louisiana, requested a Class 1 permit modification to extend the closure period for three tanks by 180 days. This modification was necessary to accommodate funding delays resulting from the Federal government sequestration.

Outcome:

- Delays in the enforceable closure schedule were approved by the Louisiana Department of Environmental Quality.

E. Modifications over the “Life of a Permit”

A case study of permit modifications over the life of a permit shows the volume of permit modification work as compared to the individual case studies listed above.

ENVIROSAFE SERVICES OF OHIO INC, (OHD045243706)

This facility is located in Oregon, Ohio and has been permitted since 1988. It has more modifications per year than most facilities, but they are largely Class 1's. Although the table below shows the permit modifications that were entered in the national database, it does not show all the permit maintenance involved (for example, compiling environmental impact statements).

This facility has eleven hazardous waste management units that are permitted. It also has expansive facility-wide corrective action that is being addressed under the authority of the permit. This facility has permitted storage and treatment units in addition to a landfill that will continue to need post-closure care under the permit when closure obligations have been satisfied.

Note that the permits below were issued by both EPA Region 5 and Ohio EPA. As states have become authorized for all of the RCRA programs, joint permits between the State and EPA have become less common. The information about the individual permit modification approvals often references a specific section of the permit and the unit or well referenced in the change to the permit. The vast majority of these modifications are requested by the permittee, but the permit modification workload has included Agency-initiated modifications as well. Ohio EPA has historically used Director-initiated modifications for selection of corrective measures for RCRA Corrective Action. For this facility, a Director-initiated modification selecting a containment strategy for historic waste management units on a portion of the facility was approved September 12, 2006. These rare Director-initiated modifications generally require a similar process to issuing a full permit and are typically as complex as Class 3 modifications.

Dates	Type of Permit Modification (Mod)
11/8/88	Federal portion of the permit issued by EPA Region 5
5/8/91	State portion of the permit issued by Ohio EPA
Mods under the First set of Permit Issuances by EPA and the State	
	1 Mod Approval for Additional Capacity.
	2 Class 3 mod approval for vertical expansion.
	6 Mod Approvals for Groundwater Monitoring.
	58 Mod approvals for unspecified ("Other") mods.
	Note: No mods were documented for the first 10 years; there may have been some mods, but not captured in the early ears of tracking RCRA data.
12/29/05	Joint Permit issued by the state program, Ohio EPA (Renewal)
	Joint Permit Issued by the EPA, Region 5. (Renewal)
2/21/06	(Federal portion of joint RCRA permit covering 40 CFR Subparts BB, CC, and DD)
Mods under the Second set of Permit Issuances by EPA and the State	
2006 Mods	
2/3/06	Update facility annual closure/post closure cost estimate.
2/21/06	Mod Approval (Other Mod)
3/16/06	Class 1A Mod approval to install a portable high capacity vacuum system.
4/3/06	Class 1A approval for (PQL's), addition of statistical comparison standards, revised well construction logs for monitoring, and addition of method 420.1
5/3/06	Mod regarding analytical methods.

Part 2

5/18/06	Approval to remove ground water monitoring wells SW-3D and MR-4S and add ground water monitoring well F-2D to affected well list for Total Phenols.
6/9/06	Approval to add previously approved and/or acknowledged mod to ESOI's December 29, 2005 permit.
8/17/06	Class 1A mod approval to replace outdated HDPE liner specifications on Table 1 of Appendix D.7.4 of permit application with standard HDPE specifications.
9/12/06	This permit mod was initiated by Ohio EPA to incorporate permit specific corrective action measures that collectively represent a containment strategy for old waste management units in the northern portion of the facility.
10/20/06	Class 1 mod approval to update City of Toledo Raw Waterline Security Agreement Weekly Inspection form.
10/20/06	Class 1 mod approval to remove the form of precipitation from permit condition J.7(b)(iii).
11/10/06	Class 1 mod to allow facility to utilize analysis of wells which are sampled in accordance with the permit and in the calendar month preceding an April and/or October semi-annual sampling event.
11/10/06	Class 1A mod approval to add and remove monitoring wells, remove benzene and selenium & fluoride
2007 Mods	
2/6/07	Class 1 mod approval to make changes to the inspection forms MF-02b (Containment Building) & MF-13 (Groundwater Monitoring Wells).
3/13/07	Class 1 mod approval for complete clean copy of the permit application.
3/16/07	Class 1A mod approval to add leachate collection and removal system performance objectives for WMSs 5, 6, & 7.
3/21/07	Class 1A mod for change in the methodology for determining hydraulic gradients and travel distances used in the ACL model.
3/29/07	Class 1A mod approval to replace the June 30, 2006 permit application with the former permit application dated August 15, 1983.
4/13/07	Class 1A mod approval to update affected and adjacent well listing at Appendix E.9 to add R-23, G-1DA, and G-1S as wells nested or adjacent to affected wells.
4/20/07	Class 1 mod approval for information on two newly installed monitoring wells.
5/8/07	Class 1A mod approval for data validation definitions in Appendix E.12 of Part B.
5/17/07	Class 1 mod approval for the Contingency Plan emergency contact information.
5/17/07	Class 1 mod approval for changes to Table of Contents to update reference to inspection forms MF-02b & MF-13.
5/17/07	Class 1 mod approval for changes to the closure/post closure cost estimate.
6/6/07	Class 1 mod approval to replace Part A RCRA Subtitle C Site I.D. form with EPA Form 8700-23.
6/20/07	Class 1 mod approval to correct revision numbers for detail drawings.
8/10/07	Class 1A mod approval to establish a target leachate head level for the west area of SWMU 5.
10/5/07	Class 1A mod approval to update dioxin/furan analysis.
11/9/07	Class 1A mod approval for update to add procedures to prevent inadvertent introduction of petroleum constituents to groundwater samples when using fueled field equipment.
11/9/07	Class 1A mod approval to include total metal prediction limits.
11/9/07	Class 1A mod approval to clarify that the ACL for areas subject to corrective action will not need to be reevaluated unless conditions change
12/5/07	Class 1 mod for informational changes (revise Permit Condition F.5 on page 91 of 165).
12/5/07	Class 1A mod approval for correction of conflicting information in the permit application regarding how earthen dikes will be constructed and managed on Hazardous Waste Landfill Cell M.
12/11/07	Class 1 mod to revise cover page for Appendix F.8 "Rail Line Inspection Forms" and revise forms MF-16(a).
2008 Mods	
1/7/08	Class 1A mod approval to update the statistical prediction limit at monitoring well
1/31/08	Class 1A mod to change the timing requirements for 3rd party data validation of semi-annual groundwater monitoring reports.
2/1/08	Class 1 mod approval to update Section G, Contingency Plan.
2/5/08	Class 1 mod approval to revise cyanide & sulfide testing methods and concentration limits.
2/8/08	Class 1A mod approval to include a Master Boring Log & Well Summary Table, Master Boring & Well log Location Drawings and well construction logs.
3/6/08	Class 1 mod approval for historical log submittal to ensure facility permit contains all boring, well construction, and well abandonment information.
3/6/08	Class 1A mod approval for Sampling and Analysis Plan updates.
4/10/08	Class 1 mod approval to add 1,4 dioxane to the affected constituent list for Monitoring Well SW-3D and to add Monitoring Well SW-3S to the affected well list for 1,4 dioxane.
5/8/08	Class 1A mod approval to add geologic cross section drawings 1 thru 10 covering the Integrated Ground Water Monitoring Program.
5/8/08	Class 1A mod approval.
5/28/08	Class 1 mod to update emergency coordinator info & revise fire brigade response personnel.
5/29/08	Class 1 mod to update closure/cost-closure cost estimates.
6/26/08	Class 1A mod approval total metals prediction limits for monitoring well R24 added to Integrated Ground Water Monitoring Program.

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6/26/08	Class 1 mod to update list of boring and monitoring well information on page E.13-24.
8/20/08	Class 2 mod approval to discontinue the semi-annual analysis of the naturally occurring constituents: sodium, chloride, and fluoride as early warning indicators of a potential release from regulated units.
9/22/08	Class 1A mod approval to add 1,4-Dioxane , add MR-3S, add nickel to the affected constituent list, and remove MR-4D and SW-2D.
9/22/08	Class 1A mod approval to update the dissolved barium comparison standards for all IGWMP wells excluding M-18S, R-23, and R-24.
9/25/08	Class 1A mod approval to update the Master Boring and Well log, update the cover page, and add well abandonment logs.
10/17/08	Class 1 mod approval for revisions to Section E for typo corrections.
2009 Mods	
3/6/09	Class1A mod approval to remove existing cover page for appendix D.2, add pages D.2-1 and D.2-2, and replace Section D cover page and Table of Contents pages D-viii thru D-xi.
4/16/09	Class 1A mod approval benzene, chloroethane, and vinyl chloride from the COSs from affected well F-2S.
4/23/09	Class 1A mod approval to add total metals predictions limits for monitoring wells G-1DA, M-18S, and M-17D.
5/21/09	Class 1 mod to update the closure & post-closure cost estimate.
6/1/09	Class 1 mod for replacement and relocation of CSF safety showers with equivalent units.
6/2/09	Class 1A mod for implementation of schedule and final design plans for SWMI I (Cell F).
6/8/09	Class 1 mod for recalculating of secondary containment for Caustic Building and Tanks 70, 73 and 74.
7/17/09	Class 1 mod to clarify notification requirements of the Response Action Plan for Containment building.
7/17/09	Class 1 mod to replace existing appendix F.10, F.10-1, and F-1(p) pages in the permit application.
7/21/09	Class 1A mod to require security at gates only when open or unlocked, and typo corrections.
8/20/09	Class 1 mod to replace Section D Table of Contents, replace existing Appendix D.5, and add pages D.5.1.
8/20/09	Class 1 mod to include the "Cell M Transducer Certification Report - May 2009."
9/8/09	Class 1A mod to Appendix D.15 Submersible Pumps and Transducer Specifications of Part B application.
9/15/09	Class 1 mod to replace existing pages D-12 through D-15, 17, 23, and 58.
10/7/09	Class 1A mod to revise and relocate the Stone Drain Column Specifications from Appendix D.31.
10/21/09	Class 1A mod for changes to Appendix E.13, Boring and Monitoring Well Information.
10/21/09	Class 1 mod to Appendix E.9 from affected well list, removal of benzene from affected constituent list and removal of trichlorofluoromethane.
11/6/09	Class 1A mod approval to allow for management of mixed RCRA & TSCA remediation waste with total PCBs concentrations.
11/27/09	Class 1 mod approval for changes to the Table "Maximum PQLs" located in Attachment C to Appendix E.9.
12/9/09	Class 1 mod approval for changes to ground water monitoring well reference point elevations.
12/17/09	Class 1A mod approval for changes in total metals prediction limits for monitoring wells and total cyanide prediction limit.
2010 Mods	
2/1/10	Class 1A mod to Module G (waterline trench monitoring program) to clarify the inspection, record keeping, and reporting requirements.
2/10/10	Class 2 mod approval to reduce height of Cell M landfill from 714 feet MSL to 700 feet MSL.
2/26/10	Class 1 mod for administrative and correctional updates i.e. revise pages G-1 and G-33. Update emergency coordinator information and update the Fire Brigade response personnel.
3/3/10	Class 1A mod to replace Module K permit pages 140 to 156 with revised pages having the same page number.
3/12/10	Class 1 mod for page replacement in the Part A Application.
4/14/10	Class 1A mod for removal of dissolved barium from the affected constituents of concern list for affected well SW-2S.
4/21/10	Class 1A mod for revisions to Module J of the Permit regarding pumping inspection, reporting & maintenance requirement for Cell M's leachate collection system, ...
5/18/10	Class 1 mod for administrative and informational changes.
6/22/10	Class 1A mod approval to add prediction limits for total metals for Monitoring Wells I-5SA and MR-3S.
6/22/10	Class 1A mod approval to clarify miscellaneous groundwater items in the Permit and Part B Permit Application.
7/6/10	Received request from facility on 7/6/10 to WITHDRAW previous mod to provide updated performance monitoring for leachate extraction at SWMU's 5, 6 & 7.
8/23/10	Class 1A mod approval to upgrade the leachate extraction systems.
8/23/10	Class 1 mod approval to update the closure and post-closure cost estimates.
10/14/10	Class 1A mod to update Appendix E.9, Groundwater Monitoring Program Sampling and Analysis Plan
10/27/10	Class 1 mod to replace existing pages D.49-8 and D.49.9 and replace the existing Appendix D.49 Cover Page.
11/15/10	Class 1 mod replace module conditions J.1dv and J.1dva on page 119 of 165 and J.4ei and J.4eii on page 127 of 165. Also, replace existing permit application page G.1-3 with revised page dated September 27, 2010.
11/24/10	Class 1 mod to remove outdated info from the Container Storage Area Inspection form MF-07 of the Part B Permit Application.

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2011 Mods	
1/11/11	Class 1 mod to permit conditions B.5 and B.5(b) & B.5(b)(iv) to specify inspection frequencies.
2/11/11	Class 1 mod to allow for container storage in any of the designated storage areas within the Stabilization/Containment Building up to the aggregate total storage capacity of 1185 cubic yards.
3/21/11	Class 1A mod approval to clarify language for Table B-1 and allows the processing of certain soil and debris wastes.
5/12/11	CLASS 1A Mod to update Attachment D, Affected and Adjacent Well Listing. Chloroethane has been added to monitoring Well F-2S.
6/20/11	CLASS 1A Mod to update the OMPM Plan for leachate extraction at SWMU 5, 6, and 7.
7/29/11	CLASS 2 Mod to treat hazardous waste containing free liquids and to add chemical oxidation, chemical reduction, and activated carbon treatments in the Stabilization/Containment BLDG.
7/29/11	CLASS 2 Mod to treat hazardous waste using encapsulation technology within 4 open-top metal tanks in Cell M.
2012 Mods	
1/25/12	CLASS 1 Permit Mod - Groundwater monitoring program sampling and analysis plan - Changes to plan as it related to sampling wells with high turbidity water.
1/25/12	CLASS 1A Permit Mod - Groundwater monitoring program sampling and analysis plan - changes to plan - affected and adjacent Well listing, 1,4 - Dioxane was removed from the affected constituent list at Well MR-1SA.
2/7/12	CLASS 1A PERMIT MOD - Revision of permit condition B.3(J)(I) to correct the citation reference to the mixture and derived-from rule in OAC 3745-51-03.
3/21/12	CLASS 1 Permit Mod - Updating the facility closure and post-closure cost estimates for inflation.
3/21/12	CLASS 1 Mod - Updating several inspection checklists used by the facility to reduce duplication and remove irrelevant questions.
8/2/12	CLASS 1A Mod to update prediction limits for barium (dissolved) at Well G-2DA and cyanide at Well R-6.
2013 Mods	
3/19/13	CLASS 1A Mod to change prediction limits for each qualifying monitoring well and a detailed description of the methods used to calculate the statistical comparison standards for the monitoring wells.
4/10/13	CLASS 1A Mods to Update: 1) Addition of tetrahydrofuran to the Affected Constituent List for Well SW-025 2) Removal of tetrahydrofuran from the Affected Constituent List for Well SW-03D 3) Removal of nickel from the Affected Constituent List for Well SW-035
4/10/13	Class 1A Mod to remove nickel from the affected constituent list for Well MR-045.
10/1/13	Class 1A mod approval to change attachment D, affected and adjacent well listing.
11/25/13	Class 1 mod approval to change EL and EH definitions and update well logs due to maintenance of well DUG-1.
11/26/13	Class 1A mod approval to reduce waste minimization requirements and reduce the required submittal of waste minimization reports to OEPA from every two years to every five years.
12/24/13	Class 1 mod approval to update permit conditions b.25 and k.7 to correct rules citations and update to current language for biennial reporting and to update section E.9 and section J of the permit application to correct rules citations and update for biennial reporting.
12/24/13	Mod approved to 1) Update dates of closure for cell M, Storage areas H and K and storage tanks s100, s200 and s400 in section 1 of permit app. 2) Correct typographical errors and remove outdated language from section 1 of permit app and 3) Update closure and post closure cost estimates and financial requirements for inflation in appendix 1.5 of the permit app.
This information came from RCRAInfo event codes on permit determinations and mod approvals. The detail about the mods was taken verbatim (in most cases) from the notes section for the permit mod approval event codes.	

APPENDIX

1. Modification Types Based on Regulatory Descriptions

This document includes: (1) the regulatory classifications for types of permit modifications and a crosswalk to applicable regulations, and (2) a table with the classification of permit modifications (Appendix I to §270.42).

2. Permit Modification Data: Background and Details

This document provides additional information and background on how the data for this report was collected, including the specific method for how information was retrieved and analyzed from EPA's national hazardous waste database (RCRAInfo).

~~~~ The materials in the appendix are contained in separate documents ~~~~