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RCRA, Superfund & EPCRA Hotline Training Module

Introduction to:

Boilers and Industrial Furnaces
(40 CFR Part 266, Subpart H)

Updated October 1999

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BOILERS AND INDUSTRIAL FURNACES

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1. INTRODUCTION

The combustion of hazardous waste occurs for two general purposes. Some waste is burned primarily to destroy it. This type of burning takes place in incinerators and was discussed in a previous module. Other waste is burned for energy or materials recovery. This occurs in a group of units collectively known as boilers and industrial furnaces (BIFs). This module will provide an overview of the regulation of these units, found in 40 CFR Part 266, Subpart H.

When EPA instituted the Resource Conservation and Recovery Act (RCRA) hazardous waste regulations in 1980, it chose only to regulate the combustion of hazardous waste in destruction units. The Agency determined that further study was needed to determine appropriate regulation for units that burn waste to recover energy or materials. This distinction was consistent with the Agency's policy of encouraging all types of legitimate recycling and reclamation.

However, the Hazardous and Solid Waste Amendments (HSWA) of 1984 mandated that EPA examine the risks posed by combustion activities and consider what controls should be placed on the burning of hazardous waste for energy recovery. The first phase of this occurred on November 29, 1985, when EPA promulgated regulations covering the burning of hazardous waste for energy recovery in BIFs under Part 266, Subpart D (50 FR 49164). These standards were largely administrative, covering only the management of the waste prior to burning and notification and recordkeeping. The combustion devices themselves were not subject to technical performance or emissions standards; nor were the facilities governed under the treatment, storage, and disposal facility (TSDF) requirements.

The second phase in developing regulations for BIFs began with the February 21, 1991, Federal Register (56 FR 7134). This rule dramatically changed the requirements for burning hazardous waste in boilers and industrial furnaces by subjecting BIFs to almost all of the TSDF standards, including extensive emissions controls, waste analysis, and permitting requirements. The regulations were expanded to cover more devices and place some limitations on specialized units. Also, as a result of this final rule, Part 266, Subpart D, was entirely removed and the regulations governing the burning of hazardous waste in BIFs were codified in Part 266, Subpart H.

This module is designed to familiarize you with the regulations affecting hazardous waste processed in BIFs. After completing this module, you should be able to define boilers and industrial furnaces and describe the criteria associated with the definitions. You should also be able to describe the requirements for processing hazardous waste in BIFs, including the distinctions between permitted and interim status units, and explain the requirements for the specially regulated BIF units.

2. REGULATORY SUMMARY

Of the 234 million tons of hazardous waste generated in the United States in 1993, three and a half million tons were sent for combustion. About half of this was processed in boilers and industrial furnaces. Boilers are normally used for energy recovery. Hazardous waste fuels provide about fifty percent of a boiler's fuel requirements and are normally mixed with natural gas or other fuels. There are around 900 boilers operating in the United States ranging from very small boilers to huge utility class boilers. Industrial furnaces, on the other hand, are usually involved in not only energy recovery but also materials recovery. These units are normally commercial facilities that handle the hazardous waste of others for a fee. There are less than fifty hazardous waste-burning industrial furnaces currently operating in the country.

The following is a summary of the regulations affecting hazardous waste processed in BIFs. These requirements include the general TSDF facility standards, extensive emission control regulations, standards for the direct transfer of waste from a transportation vehicle to a unit, and regulation of residues. Some units are subject to special reduced requirements depending on the type of waste processed in the unit and the unit's capacity. Because of the technical nature of these regulations, only an outline of the requirements is provided here. For more detail concerning implementation of the BIF regulations, see the February 21, 1991, Federal Register (56 FR 7134).

2.1 APPLICABILITY AND EXEMPTIONS

There are two classes of units covered under the Part 266, Subpart H regulations — boilers and industrial furnaces. EPA defines a boiler as an enclosed device that uses controlled flame combustion to recover and export energy in the form of steam, heated fluid, or heated gases. Boilers must have a combustion chamber and primary energy recovery system of integral design to ensure the effectiveness of the unit's energy recovery system and to maintain a thermal energy recovery efficiency of at least 60 percent. Finally, in order to meet EPA's definition of boiler the unit must export and use at least 75 percent of the recovered energy off site (§260.10).

An industrial furnace is a unit that is an integral part of a manufacturing process and uses thermal treatment to recover materials or energy. A list of the units that meet this description is found in §260.10. At this time the following twelve devices are considered to be industrial furnaces:

- Cement kiln
- Lime kiln

- Aggregate kiln
- Coke oven
- Smelting, melting, and refining furnace
- Methane reforming furnace
- Pulping liquor recovery furnace
- Phosphate kiln
- Blast furnace
- Titanium dioxide chloride process oxidation reactor
- Halogen acid furnace
- Combustion device used in the recovery of sulfur values from spent sulfuric acid.

The Administrator may, after notice and comment, add other devices to the list of industrial furnaces. In adding devices to the list of industrial furnaces, EPA will consider factors related to the design and use of the unit.

EXEMPTIONS (§266.100(b)):

Not all units that meet the definition of boiler or industrial furnace are subject to the BIF standards. The individual unit must first be evaluated against a number of exemptions found in the applicability section of the regulations. For a variety of reasons, EPA determined that the following units do not require stringent regulation under Part 266, Subpart H:

- Units burning used oil for energy recovery under Part 279
- Units burning gas recovered from hazardous or solid waste landfills for energy recovery
- Units burning hazardous wastes exempt from regulation under §§261.4 and 261.6(a)(3)(iii)-(v)
- Units burning hazardous waste produced by conditionally exempt small quantity generators regulated under §261.5
- Coke ovens that burn only K087, decanter tank tar sludge from coking operations.

CONDITIONALLY EXEMPT UNITS

In addition to these exemptions, there are three types of units that are conditionally exempt from the regulations. These are metal recovery furnaces, precious metal

recovery units, and certain other special industrial units. In order to claim these exemptions, owners/operators must provide a one-time written notice claiming the exemption, conduct sampling and analysis, and maintain records to demonstrate compliance with all applicable requirements. Any waste management prior to burning in this type of unit, and any resulting residues, are subject to applicable hazardous waste regulation.

Metals Recovery (§266.100(c)(2))

Owners/operators of smelting, melting, and refining furnaces that process hazardous waste solely for metal recovery are conditionally exempt from regulation under this subpart. The Agency has established three criteria to determine if hazardous waste is being legitimately burned for metals recovery: (1) the heating value of the waste does not exceed 5,000 Btu/lb (if so, the waste is considered to be burned for energy recovery); (2) the concentration of Part 261, Appendix VIII, organic constituents does not exceed 500 ppmw (if so, the waste is considered to be burned partially for destruction); and (3) the waste must have demonstrated recoverable levels of metals (§§266.100(c)(1)(i) and (c)(2)). Units which may be covered by this exemption include pyrometallurgical devices such as cupolas, sintering machines, roasters, and foundry furnaces, but do not include cement kilns or halogen acid furnaces.

Precious Metals Recovery (§266.100(f))

Metal recovery units engaged in precious metals recovery are also conditionally exempt from Part 266, Subpart H. Precious metal recovery is defined as the reclamation of economically significant amounts of gold, silver, platinum, paladium, irridium, osmium, rhodium, ruthenium, or any combination of these metals (§266.70(a)). Provided the owner/operator complies with the alternative requirements of §266.100(f), the unit would be exempt from all BIF requirements except for the regulations in §266.112 concerning the management of residues.

Special Industries (§266.100(c)(3))

Certain industrial units, such as secondary lead and nickel-chromium smelters and mercury recovery furnaces, and other units that process wastes from metals recovery normally do not meet the conditions necessary to be considered legitimately burned for metals recovery. EPA revised the BIF standards to conditionally exclude those wastes which are processed for metals recovery, but do not meet the criteria. Wastestreams in these units must contain recoverable levels of metals and the waste must not contain more than 500 ppm of the toxic organics listed in Part 261, Appendix VIII to be considered for this conditional exemption.

SMALL QUANTITY BURNERS (§266.108)

Owners/operators of facilities that burn small quantities of hazardous waste with a heating value of greater than or equal to 5000 Btu/lb are also exempt from Part 266, Subpart H. They must, however, comply with the quantity restrictions based on stack height and the surrounding terrain. Also, the hazardous waste firing rate may not exceed one percent of the total fuel requirements. These units are prohibited from burning any waste that contains or is derived from dioxin-bearing wastes (i.e., F020, F021, F022, F023, F026, or F027). Small quantity burners are required to notify EPA and maintain facility records documenting compliance with these restrictions. Small quantity burners are also exempt from the requirements in Parts 264/265, Subparts A through L, and Part 270 with respect to the storage of mixtures of hazardous waste and primary fuel, if the waste is stored in tanks that feed fuel directly into the burner (§266.101(c)(2)).

2.2 EMISSIONS STANDARDS

BIFs are required to comply with strict air emissions standards to ensure adequate protection of human health and the environment. These standards are divided into four contaminant categories: organics, particulate matter, metals, and hydrogen chloride (HCl) and chlorine (Cl_2). For each category or type of emission, the regulations establish compliance methods and alternatives. Each is addressed below.

Contaminant	Emission Standard	Regulatory Citation
Organics	DRE and CO limits	§266.104
Particulate Matter	180 mg/dscm	§266.105
Metals	Tiered approach	§266.106
Chlorine	Tiered approach	§266.107

ORGANICS (§266.104)

Burning hazardous waste that contains toxic organic compounds under poor combustion conditions can result in substantial emissions of toxic compounds. This includes both those compounds originally present in the waste, as well as the emission of other compounds formed by the partial or incomplete combustion of the waste constituents. These types of emissions can result in an array of adverse health effects, including an increased lifetime cancer risk to humans. EPA controls organic emissions from BIFs by implementing two types of organic emission performance standards. The first requires the measurement of the unit's destruction and removal efficiency, and the second limits the unit's output of products of incomplete combustion. Both of these standards are discussed below.

Destruction and Removal Efficiency (§266.104(a))

The primary measure of the BIF's organic emissions is its destruction and removal efficiency (DRE). This is basically a measure of how efficiently the BIF is destroying organics. Since it would be impossible to monitor the DRE results for every organic constituent in the waste, certain principle organic hazardous constituents (POHCs) are selected for this monitoring. These POHCs are selected based on their high concentration in the waste stream and their difficulty to burn. If the BIF achieves the required DRE for the POHCs, then it should be able to achieve the same, or better, DRE for all other, easier to burn, organics in the waste stream. POHCs are designated in the unit's trial burn plan and permit.

The BIF must achieve a DRE of 99.99 percent for each POHC in the hazardous waste stream during the unit's compliance test, known as the trial burn. This means that for every ten thousand molecules entering the unit, only one molecule of the POHC is released to the atmosphere. In addition, due to an increased threat to human health and the environment from dioxin, the required DRE for POHCs in dioxin-bearing wastes has been established at 99.9999 percent, or one released molecule for every one million burned. It is important to note that this DRE standard applies only to permitted units.

Under certain conditions, a BIF owner/operator may obtain an exemption from the DRE requirements when burning low-risk waste. Waste can be shown to be low risk if, under a reasonable, worst-case scenario, emissions of organics and metals do not exceed acceptable levels (§266.109(a)).

Products of Incomplete Combustion (§266.104(b)&(c))

Poor combustion conditions result in the release of a high concentration of organic materials formed during the combustion process. These products of incomplete combustion (PICs) may be present in the original waste stream or may be new compounds that form during the thermal breakdown and subsequent recombination of organic compounds. In order to control the emission of PICs, EPA places limits on carbon monoxide (CO) emissions or, if necessary, hydrocarbon (HC) emissions from the unit. The presence of carbon monoxide is an indicator of incomplete combustion. Therefore, a high level of carbon monoxide in emissions is an indicator of incomplete combustion and thus, an indication of a high release of PICs. The BIF owner/operator has a choice of two options to meet this CO emission standard. They may meet a CO emission standard of 100 ppmv (parts per million by volume), with no limits on HC emissions, or they may meet an HC limit of 20 ppmv, with CO emission limits based on levels demonstrated during the unit's trial burn.

	CO Concentration	HC Concentration
OPTION ONE	100 ppmv	No limit
OPTION TWO	Determined in trial burn	20 ppmv

Historically, there was an alternative, site-specific HC limit for furnaces with high amounts of organic matter in their raw materials. However, this alternative was vacated by a federal appeals court in a 1994 decision. The controls were declared legally obsolete in the June 29, 1995, Federal Register and removed from the regulations (60 FR 33912).

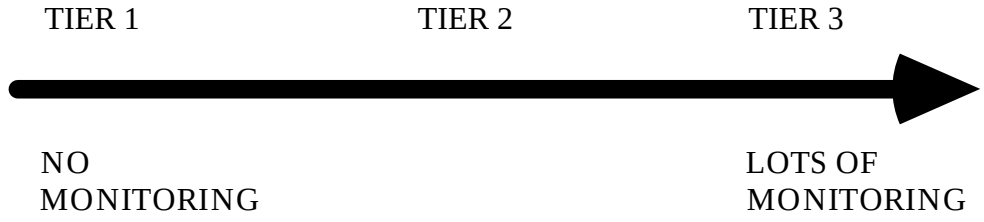
PARTICULATE MATTER (§266.105)

The second emission EPA regulates is particulate matter. Particulate matter consists of small dust-like particles emitted from BIFs. Although the particles themselves may cause adverse health effects (e.g., increased asthma), they also provide a point of attachment for toxic metals and organic compounds. The particulates may become caught in the lungs or be absorbed into the environment. To minimize these adverse conditions, EPA set an emission limit of 180 milligrams per dry standard cubic meter (dscm). BIFs that qualify for the low-risk waste exemption mentioned above, however, are not subject to the particulate matter standard (§266.109(b)).

METALS (§266.106)

The third aspect of the emissions standards involves limits on metals. Metals regulated under the BIF standards are categorized as either noncarcinogenic (i.e., antimony, barium, lead, mercury, silver, and thallium) or carcinogenic (i.e., arsenic, cadmium, chromium, and beryllium). The owner/operator can determine the allowable feed or emission rate for each regulated metal by selecting any one of three approaches, called tiers. Each tier differs in the amount of monitoring, and in some cases, modeling, the owner/operator is required to do.

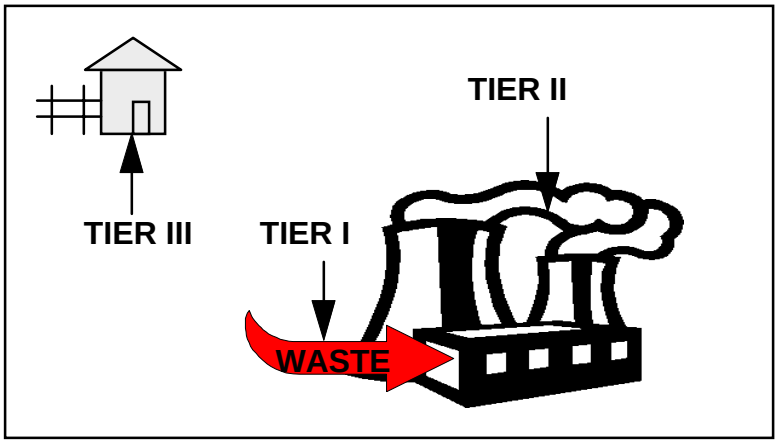
Figure 1: Continuum of Tiers and Monitoring



Factors that may be considered in selecting a tier include the physical characteristics of the facility and surrounding terrain, the anticipated waste compositions and feed rates, and the level of resources available for conducting the analysis. The main distinction

between the Tiers is the focal point. This is the point at which the owner/operator must ensure that the metal concentration of their waste will be below EPA's acceptable exposure levels for that constituent.

Figure 2: Focal Point of Tiers



Tier I

The focal point of Tier I is the waste feed. This tier limits the hourly feed rate of individual metals into the combustion device. These limits have been developed by EPA and can be found in Part 266, Appendix I. EPA established these feed rate limits by considering flue gas flows, stack height, terrain and land use in the vicinity of the facility. EPA determined acceptable air quality levels for each type of metal as a function of terrain, stack height, and land use in the vicinity of the facility. This value is also the waste feed rate, as Tier I assumes that 100 percent of the metals that are fed into the unit will be released into the atmosphere.

Tier II

The focal point of Tier II is the stack. This Tier limits the emissions of individual metals from the stack. As with Tier I, emission limits have been pre-determined by the Agency by considering a number of different factors (i.e., stack height, terrain, and surrounding land use) and are found in Part 266, Appendix I. Tier II differs from Tier I, however, in that owners/operators are able to conduct emission testing to take credit for reduced metal emissions achieved either by the partitioning of pollutants to bottom ash or products, or by removal of the pollutants though the facility's air pollution control device. By conducting tests to determine how much of the metals fed into the BIF are emitted through the stack, owners/operators using Tier II can conceivably increase the amount of metals in the waste feed by accounting for waste partitioning and pollution control activities.

Tier III

The focal point of Tier III is the surrounding environment. Tier III limits must be set such that the metals will not adversely affect the ambient air quality. It allows the owner/operator to use site-specific factors to back calculate from the ambient levels to determine the unit's waste feed. Tier III standards are implemented in the same way as Tier II, by placing emission limits on metals, but unlike Tiers I and II, there are no pre-determined levels established by EPA. Instead, the facility owner/operator determines emission levels by testing emission rates for each individual metal using air dispersion modeling techniques to predict maximum ground level metal concentrations that will not adversely affect human health and the environment, and by demonstrating that ambient air levels will not be exceeded.

Adjusted Tier I (§266.106(e))

A BIF owner/operator may choose to adjust the feed rate limits that have been established in Appendix I by combining some of the aspects of Tier I and Tier III. This alternative is implemented in the same way as the Tier I standards, by regulating feed rates into the BIF, but allows for limits that are more relevant to a given facility. As with the Tier III methodology, owners/operators may back-calculate maximum allowable emission rates for their facility from acceptable ambient air levels (found in Appendices IV and V) using site-specific air dispersion modeling. These emission limits then become the adjusted feed rate limits for that facility.

Alternative Implementation (§266.106(f))

Owners/operators are also allowed to use a combination of the Tier II and Tier III methodologies. Under this approach, rather than monitoring metal feed rates, a BIF would monitor the emission rates contingent upon approval from the Regional waste management director.

HYDROGEN CHLORIDE AND CHLORINE GAS (§266.107)

The final emission standard under the BIF regulations limits the unit's output of hydrogen chloride (HCl) and chlorine gas (Cl_2). These compounds combine with water in the air to form acid rain. They are also a known cause of human respiratory problems. The emission controls are implemented in the same way as the metal emissions, using the tiered approach. The owner/operator has a choice of three tiers with varying focal points. For a more detailed discussion of EPA's tiered approach, see above. The Tier I and Tier II screening levels for waste feed and stack emission limits are located in Part 266, Appendix II and III.

2.3 OPERATING REQUIREMENTS

Operating requirements for BIFs are determined on a site-specific basis, and serve as day-to-day requirements that the facility must follow in order to ensure compliance with the emissions standards set by the regulations. The BIF regulations do not specify precise operating requirements that all units must follow; rather, units must establish operating standards that allow them to meet the emission standards in the regulations. In addition to the general operating standards discussed below the BIF may establish operating standards for feed rate, combustion temperature, flue gas temperature, contaminant concentrations in stack gases, and other conditions as determined necessary.

MANAGEMENT PRIOR TO BURNING (§266.101)

The management of hazardous waste prior to burning in a BIF is subject to all applicable RCRA regulations. Generators of hazardous waste are required to comply with Part 262 regulations, while transporters of hazardous waste are subject to Part 263. In addition, any storage prior to burning is subject to the hazardous waste storage regulations in Parts 264/265 and the permitting requirements of Part 270 unless the unit is a small quantity burner, as described above. This management requirement includes storage activities conducted by the burner as well as any intermediaries.

TSDF STANDARDS (§266.102(a)(2))

Permitted BIFs are subject to all of the general TSDF standards including general operating standards, preparedness and prevention, contingency plan, use of the manifest system, closure and financial assurance, and corrective action. These provisions are described in detail in other Training Modules.

HAZARDOUS WASTE ANALYSIS (§266.102(b))

The BIF owner/operator must perform a waste analysis to identify the type and quantity of hazardous constituents that may be reasonably expected to be found in the waste. This analysis must include all hazardous constituents found in Appendix VIII of Part 261. The facility must provide an explanation for any constituents not included in the analysis. In addition to the initial analysis, the owner/operator must conduct periodic sampling and analysis to ensure that the hazardous waste is within the limits of the facility's permit.

FUGITIVE EMISSIONS (§266.102(e)(7))

The BIF must be operated such that emissions escaping from the combustion chamber are minimized. The owner/operator has two options from which to choose: (1)

maintain a negative pressure in the combustion zone so that air is pulled into the unit rather than escaping into the atmosphere and (2) totally seal the combustion chamber so that no emissions can escape to the environment.

DIRECT TRANSFER (§266.111)

Facilities that transfer hazardous waste directly from a transport vehicle (e.g., a tanker truck) to the BIF without first storing the waste must comply with special requirements. Generally, direct transfer operations must be managed in a manner similar to that required by the regulations for hazardous waste storage tanks and containers. In addition, the direct transfer equipment must have a secondary containment system, the owner/operator must visually inspect the operation at least once every hour, and the facility must keep records of these inspections.

GENERAL STANDARDS (§266.102(e)(7)-(11))

In addition to the standards described above, the BIF owner/operator must fulfill requirements for establishing an automatic waste feed cutoff system. The facility must also conduct inspection and monitoring, maintain certain records, and close in accordance with given regulations.

2.4 PERMIT PROCESS (§270.66)

An owner/operator wishing to operate a new hazardous waste BIF is required to obtain a RCRA permit before beginning construction of the unit. The purpose of this permit is to allow the new BIF to establish operating conditions that will ensure adequate protection of human health and the environment. The BIF permit process consists of four operational phases: pre-trial burn, trial burn, post-trial burn, and final operating conditions.

PRE-TRIAL BURN

The pre-trial burn phase of the permit allows the BIF to achieve the state of operational readiness necessary to conduct the trial burn. The pre-trial burn permit conditions are effective for the minimum time (not to exceed 720 hours) required to bring the BIF to a point of operational readiness to conduct a trial burn. This phase is often referred to as the shakedown period.

TRIAL BURN

The trial burn can be seen as the "test drive" of the BIF. It is the time when the owner/operator will bring the unit up to operational readiness, monitor the key operating conditions, and measure the emissions. These conditions are based on the

operating conditions proposed by the permit applicant in the trial burn plan submitted to EPA for evaluation. EPA establishes conditions in the permit necessary to conduct an effective trial burn, meaning that the burn will be representational of the BIF's intended day-to-day operation and will yield meaningful data for analysis.

POST-TRIAL BURN

The post-trial burn period is the time for EPA to evaluate all of the data that was recorded during the BIF's trial burn. To allow the operation of a hazardous waste BIF following the completion of the trial burn, EPA establishes permit conditions sufficient to ensure that the unit will meet the BIF performance standards. This post-trial burn period is limited to the minimum time required to complete the sampling, analysis, data computation of trial burn results, and the submission of these results to EPA.

FINAL OPERATING CONDITIONS

After reviewing the results of the trial burn, EPA will modify the permit conditions again as necessary to ensure that the operating conditions of the BIF are sufficient to ensure compliance with BIF standards and protection of human health and the environment. Owners/operators of BIFs must comply with the final permit conditions for the duration of the permit, or until the permit is modified. The unit must be managed in accordance with all of the operating conditions described in the permit and established by the trial burn (§266.102(d)(1)).

DATA IN LIEU OF TRIAL BURN

While most BIFs must undergo a trial burn, it is possible for a facility to submit extensive information in lieu of the trial burn. EPA believes that most combustion units will need to conduct trial burns in order to develop operating conditions that ensure compliance with the performance standards. Data submitted in lieu of the trial burn, therefore, must originate from a unit with a virtually identical design that will burn wastes under virtually identical conditions (located at the same facility).

OMNIBUS AUTHORITY (§270.32(b)(2))

The omnibus provision allows the Regional Administrator or state to incorporate into a permit any provision deemed necessary to protect human health and the environment. Specifically, this allows EPA to incorporate additional terms or conditions not found in the regulations, if site-specific circumstances dictate this result. Under the 1994 Strategy for Hazardous Waste Minimization and Combustion, EPA directed the states and Regions to conduct site-specific risk assessments (incorporating direct and indirect exposures) into a combustion unit's permit using this omnibus authority. These risk assessments can be conducted by either the implementing agency or the facility (subject to agency oversight) during the permitting process.

PUBLIC PARTICIPATION

On December 11, 1995, EPA published a final rule expanding the role of public participation in the RCRA permitting process (60 FR 63417). This rule affects boilers and industrial furnaces by increasing the extent of public participation during the trial burn process. Specifically, the permitting agency is required to issue a public notice prior to approving a facility's trial burn plan and must announce the commencement and completion dates for all trial burns. The proposed public participation rule (59 FR 28680; June 2, 1994) also included some changes to the procedural requirements for permitting interim status facilities. These changes, however, were not finalized because of pending technical revisions to the hazardous waste combustor standards. See the Regulatory Developments section of this module for a discussion of these revisions.

2.5 INTERIM STATUS FACILITIES

As of now only one BIF permit has been issued in the country. On August 15, 1996, in a joint effort between Region VII and the Kansas Department of Health, a permit was issued to a cement kiln at the Ash Grove Cement Company in Chanute, KS. Therefore, most BIFs are currently operating under interim status.

EPA estimated that of the 1,000 BIFs burning hazardous waste prior to the 1991 final rule, only 150 would apply for interim status and eventually seek final RCRA permits. There are currently approximately 130 facilities that have one or more hazardous waste-burning boilers or industrial furnaces.

To qualify for interim status, the facility must have been in existence on or before August 21, 1991, and must have submitted a Part A permit application by this date. If the facility already had a permit for another activity, owners/operators must have submitted a permit modification under §270.42. If the facility was already operating under interim status for another activity, then it was required to comply with the requirements for changes under interim status described in §270.72.

Until EPA calls in the facility's Part B permit application, where precise permit conditions will be established through a trial burn, owners/operators of interim status BIFs must ensure compliance with emission standards (§§266.105 - 266.107) by showing certification of precompliance and certification of compliance. As the deadlines for these certifications have already passed all interim status BIFs, except for possible extenuating circumstances, should be in the compliance stage.

CERTIFICATION OF PRECOMPLIANCE (§266.103(b))

In order to certify precompliance, the owner/operator established operating conditions under which the BIF would meet emissions standards. These operating conditions must have included feed rates of hazardous waste, metals, chlorine and chloride, and ash. The operating conditions should have been documented in a certification of precompliance, submitted by August 21, 1991. Prior to submitting this certification of compliance, interim status owners/operators were not allowed to feed hazardous waste with a heating value of less than 5000 Btu/lb into a boiler or industrial furnace. By requiring burners to demonstrate that a waste's heating value is greater than or equal to 5,000 Btu/lb, the Agency was able to ensure a high enough temperature and long enough residence time in the boiler to destroy hazardous constituents at a rate which is protective of human health and the environment.

CERTIFICATION OF COMPLIANCE (§266.103(c))

Owners/operators that were required to submit a certification of precompliance must have conducted compliance testing to verify the operating conditions on or before August 21, 1992. Within 90 days after compliance testing, the owner/operator must have submitted a certification of compliance containing operating conditions based on the results of the testing. The certification included a description of any changes that had taken place since precompliance, as well as the test data and results of quality assurance and quality control work. Throughout the remainder of interim status, the BIF is required to comply with the operating limits contained in this certification.

As mentioned above, interim status BIFs must be operated much in the same way as those facilities with permits. As with permitted BIFs, owners/operators of interim status BIFs must comply with all applicable TSDF regulations in Part 265. In addition, because interim status facilities have not yet conducted trial burns to ensure compliance with the standards, EPA has placed some restrictions on their use and what types of hazardous waste these facilities may burn. These restrictions are discussed below.

PROHIBITION ON BURNING DIOXIN-CONTAINING WASTE (§266.103(a)(3))

A BIF operating under interim status may not burn dioxin-containing hazardous wastes (F020, F021, F022, F023, F026, and F027) or any material derived from one of these wastes. As an exception to this prohibition, interim status BIFs may burn F032 waste (even though it is listed for the presence of dioxin) because the Agency does not consider it "acutely toxic."

SPECIAL REQUIREMENTS FOR INTERIM STATUS FURNACES

Interim status furnaces are required to comply with all of the performance standards with the exception of the DRE. In addition, EPA established special interim status

requirements for industrial furnaces to ensure adequate combustion of hazardous waste until more stringent, permitted conditions could be established through completion of the facility's trial burn. These conditions include minimum temperatures, assurance of adequate oxygen, and continuous hydrocarbon monitoring (§266.103(a)(5)).

These requirements do not apply to a furnace that burns hazardous waste solely as an ingredient. The requirements also do not apply to any furnace that feeds the hazardous waste into the hot end of the furnace, where products are normally discharged and fuels are normally fired.

2.6 REGULATION OF RESIDUES (§266.112)

Under the traditional hazardous waste regulations, the derived-from rule requires that anything derived from the treatment, storage, or disposal of a hazardous waste is, itself, a hazardous waste (§261.3(c)(2)). Thus, any residue generated from the burning of hazardous waste in a BIF would normally be considered a hazardous waste under RCRA and would need to be handled in accordance with Subtitle C regulation. The Bevill Amendments, however, provide three statutory exclusions from the definition of hazardous waste for certain residues: residues from the burning of coal and fossil fuels (§261.4(b)(4)); cement kiln dust (§261.4(b)(8)); and residues from the processing of certain mining wastes (§261.4(b)(7)). Some question has arisen as to whether these exemptions should apply to residues that are produced when both hazardous waste and fossil fuels are burned. EPA has ruled that the exemptions may stand if the co-burning does not significantly affect the character of the waste residues.

The regulations retain the Bevill exclusion for residues from certain BIFs as long as the burning or processing of the hazardous waste does not significantly affect the character of the residue. These BIFs include:

- Boilers burning primarily coal (i.e., at least 50 percent coal)
- Industrial furnaces processing primarily normal ores or minerals (i.e., at least 50 percent normal nonhazardous raw materials)
- Cement kilns processing primarily normal raw materials (i.e., at least 50 percent normal raw materials).

To determine whether the character of a residue has been significantly affected by the burning or processing of hazardous waste, and thus whether the Bevill exemption can be claimed, one of two criteria must be met. As long as the residue meets either criteria, it will qualify for the Bevill exclusion.

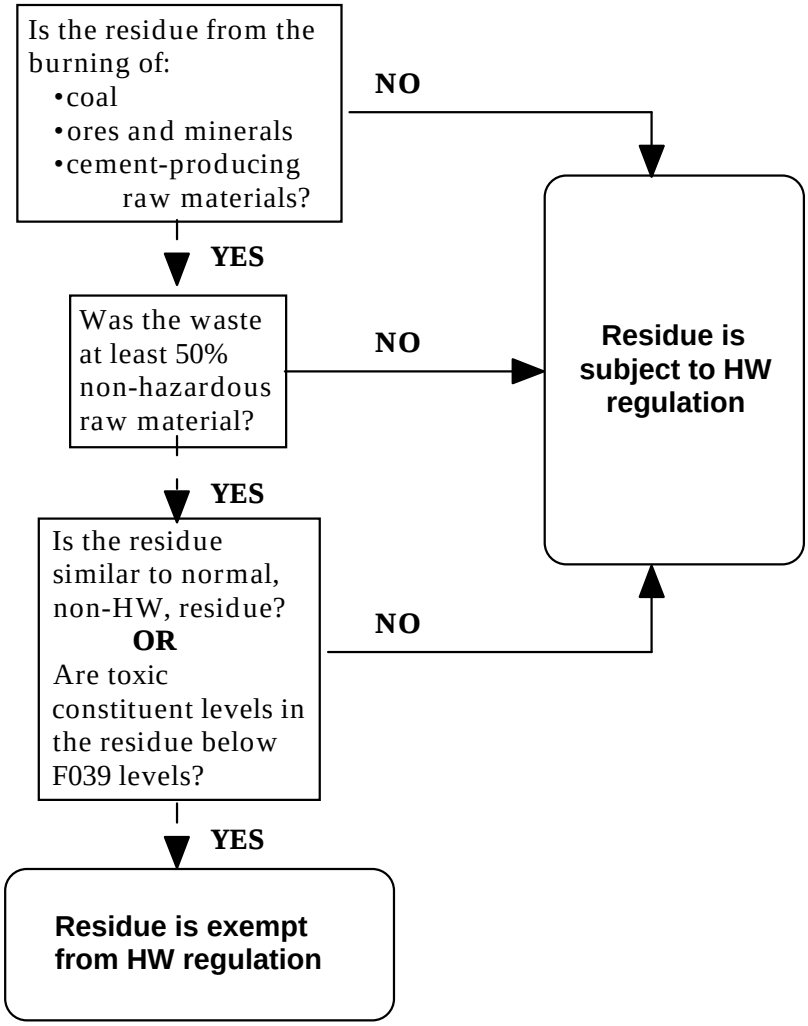
The first criteria compares the hazardous waste residues to waste residues that would be found if the BIF were not burning hazardous waste at all. A statistical test, found in

Appendix IX of Part 266, describes methods that should be used when comparing the waste-derived residues to these baseline levels to determine whether the character of the residue has been significantly affected.

The second criteria compares the concentrations of toxic constituents found in the waste-derived residue to health-based constituent limits found in Appendix VII of Part 266. In response to a 1993 petition, however, EPA replaced the health-based limits for nonmetal constituents with the LDR standards listed under F039 (58 FR 59598; November 9, 1993).

Provided the residues meet these standards, they would not be regulated as hazardous waste. If results from either part of this test indicate that the character of the residue has not been significantly altered, the BIF residue qualifies for the Bevill exemption. Figure 3 describes this process:

Figure 3: Regulation of Residue from BIFs



3. REGULATORY DEVELOPMENTS

On April 19, 1996, EPA published a proposed rule, called the "MACT" rule (maximum achievable control technology), under the joint authority of RCRA and the Clean Air Act (CAA), to upgrade the emission standards for hazardous waste combustors (61 FR 17358). Specifically, this rule will affect incinerators, cement kilns, and lightweight aggregate kilns. It proposes emissions standards for dioxins, furans, mercury, cadmium, lead, particulate matter, hydrochloric acid, chlorine, hydrocarbons, carbon monoxide, and several low-volatile metals. EPA plans to address boilers and other industrial furnaces in a future rulemaking. This rule fulfills EPA's commitment to upgrade emissions standards as stated in its 1994 Strategy for Hazardous Waste Minimization and Combustion.

On June 19, 1998, EPA finalized the first phase of the MACT rule (63 FR 33782). This final rule includes the comparable fuels exclusion and amendments to the permit modification procedures for combustion facilities. EPA expects to finalize the remainder of the April 19, 1996 proposal in early 1999.

EPA expects that many combustion facilities currently operating under RCRA permits will need to modify their permits in order to comply with the upcoming MACT emissions standards. The current permit modification procedures are time consuming and may hinder facilities from meeting the three-year compliance deadline established by the CAA. To facilitate meeting the deadline, EPA revised the RCRA permit modification procedures to explicitly address changes to a facility's design or operations that are necessary to comply with the MACT standards (63 FR 33782, 33801; June 19, 1998). EPA designated such changes as Class 1 modifications that require prior Agency approval (see Permits and Interim Status module for further discussion of permit modifications). EPA also incorporated a time default of 90 days, with a possible one-time 30-day extension, for the permitting agency to make a decision about the requested modification. If the agency fails to make a decision within the default time frame, the permittee may consider the request approved. In authorized states, owners and operators of facilities subject to the MACT standards will only be able to take advantage of the revised permit modification procedures if the state has become authorized for the revised modification provisions (see State Programs module for further discussion of state authorization).

Interim status combustion facilities subject to the MACT standards will also have to meet the three-year deadline. Interim status facilities are allowed to implement certain facility changes if the changes do not amount to reconstruction (see Permits and Interim Status module for further discussion of reconstruction). To ensure that the reconstruction clause does not present an obstacle for interim status facilities trying to

implement changes to meet the new MACT emissions levels, EPA exempted changes necessary to comply with the MACT standards from the reconstruction limit.

NOTICE OF INTENT TO COMPLY

EPA carefully considered public participation when promulgating the streamlined permit modification procedures. In order to provide for public involvement early in a source's compliance planning process, EPA requires owners and operators of combustion facilities subject to the MACT standards to submit a Notification of Intent to Comply (NIC) within one year of promulgation of the final standards indicating whether the source intends to come into compliance with the new standards (63 FR 33782, 33806; June 19, 1998). In addition to submitting the NIC, EPA requires covered facilities to provide notice of and host an informal meeting with the community to discuss plans for complying with the MACT standards and to submit a progress report within two years of promulgation of the final standards which demonstrates progress made toward meeting the emissions standards.

WASTE MINIMIZATION AND POLLUTION PREVENTION

The CAA compliance deadline may cause companies to install simple end-of-pipe emissions controls, instead of pollution prevention process changes. In order to limit this practice and encourage waste minimization, EPA allows owners and operators of combustion facilities to request a one-year extension to the MACT compliance period in cases where additional time is needed to install pollution prevention and waste minimization measures that reduce the amount of hazardous waste entering combustion feedstreams (63 FR 33782, 33816; June 19, 1998). Requests for a one-year extension must reasonably document that the waste minimization measures could not be installed in time to meet the three-year compliance period. Decisions to grant the extensions will be made by EPA or authorized state programs.

The rule proposes emissions standards for dioxins, furans, mercury, cadmium, lead, particulate matter, hydrochloric acid, chlorine, carbon monoxide, hydrocarbons, and several low volatile metals. It also proposes a new comparable fuels exclusion, and makes significant changes to the existing combustion regulations.

EPA intends to finalize this proposal in two parts. The first part, expected in late 1997 or early 1998, is likely to include the comparable fuels exemption and the permit modification amendments. The second part, expected later in 1998, will finalize the remaining issues from the April 19, 1996 proposal.