United States General Accounting Office

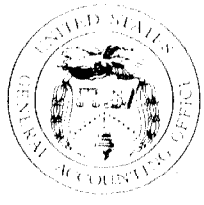
GAO

Report to the Honorable T. Cass Ballenger, House of Representatives

October 1991

HAZARDOUS WASTE

Incinerator Operating Regulations and Related Air Emission Standards



GAO/RCED-92-21

GAO

United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-245416

October 16, 1991

The Honorable T. Cass Ballenger
House of Representatives

Dear Mr. Ballenger:

As requested, we are currently investigating for you and several other Members of Congress the questions of (1) whether Caldwell Systems, Inc., (CSI) operated its hazardous waste incinerator in compliance with federal environmental and worker safety laws and regulations and (2) what role EPA and the Occupational Safety and Health Administration have in regulating and overseeing CSI's operations. We expect to issue a report on these issues early next year.

On June 12, 1991, we briefed you on the status of our ongoing review. At that time, you asked us to provide you with a separate report addressing the regulation of incinerators. Specifically, you requested information on the differences between hazardous waste incinerators that have received permits under the Resource Conservation and Recovery Act (RCRA) of 1976 and those that are classified as having interim status (that is, they are allowed to operate for some limited period of time without a permit). You were interested in these differences because the CSI incinerator in Caldwell County, North Carolina, was allowed to operate on an interim status basis until it met permit requirements or closed down, as required under RCRA. The incinerator closed in May 1988 without meeting the permit requirements. Also, we agreed to provide you with information on emissions standards in effect for incinerators during and after the years that CSI was in operation. This report responds to your recent request.

Results in Brief

There are several major differences between the regulations for permitted and interim status incinerators. The regulations for permitted incinerators are more comprehensive than the related regulations for interim status incinerators. Proper implementation of these permit regulations by facilities should provide more human health and environmental protection than those being provided by the interim status regulations.

We identified the following major differences between the regulations:

- Permitted incinerators must conduct trial burns that meet performance standards, while interim status incinerators are not generally required to do so.
- Permitted incinerators must continuously monitor operating conditions and maintain extensive monitoring records, while interim status incinerators must monitor conditions only every 15 minutes and are not required to maintain monitoring records.
- Permitted incinerators must meet waste analysis requirements that are more specific and extensive than those for interim status incinerators.
- Permitted incinerators must store hazardous waste containers in a containment system, while interim status incinerators are not required to do so.

Six incinerators continue to operate under interim status.

In addition to RCRA regulations, incinerators are subject to hazardous emissions standards set by EPA under section 112 of the Clean Air Act. During the years that CSI was in operation, EPA had set only eight hazardous emissions standards. Since then, however, the Clean Air Act Amendments of 1990 established a list of 190 toxic air pollutants for regulation under section 112. The act established a 10-year schedule for EPA to set standards for these pollutants. Newly permitted and existing incinerators must meet the applicable requirements of the 1990 amendments.

Background

RCRA required EPA to establish regulations governing the handling of hazardous wastes and require treatment, storage, and disposal facilities to obtain an operating permit. EPA may authorize a state to administer its own RCRA program if the state's program is at least as stringent as the federal program and provides for adequate enforcement. In 1980, North Carolina, where the CSI incinerator was located, was authorized by EPA to administer its RCRA program.

Recognizing that it would take EPA and authorized states many years to process all permit applications, RCRA allowed hazardous waste facilities that were in existence on November 19, 1980, and applied for a permit to operate under "interim status," as though they had obtained a permit. EPA developed two sets of regulations—one for permitted facilities and the other for interim status facilities. The two sets of regulations governing incineration of hazardous waste are included in 40 C.F.R. parts 264 and 265, respectively. In addition, 40 C.F.R. part 270 contains requirements for obtaining a RCRA permit.

The interim status regulations require owners/operators to follow "good housekeeping" practices, such as monitoring and inspecting the facility, but these requirements are less comprehensive than those that apply to permitted facilities. For example, unlike regulations for permitted facilities, the interim status regulations are generic, because the owners/operators do not operate under a permit containing site-specific operating requirements.

The permit regulations are a mix of performance standards and "design and operating" criteria included in facility-specific permits. A permitted facility may burn only those wastes specified in the permit. The performance standards set strict limits on the amount of toxic pollutants allowed in emissions.

RCRA, as amended by the Hazardous and Solid Waste Amendments of 1984, established a deadline of November 8, 1986, for owners/operators of interim status incinerators to submit a final permit application. Those who failed to meet this deadline lost interim status on November 8, 1989, and were required to close their incinerators. Those who met the deadline are allowed to operate under interim status until their permit applications are either approved or denied. Today, all new incinerators must comply with the permit regulations and obtain a RCRA permit before beginning construction. Because of the complexity of the permit process, EPA and the authorized states have encountered lengthy delays in issuing incinerator permits. As of September 1991 six incinerators continue to operate under interim status. EPA does not have an estimate of when these facilities will be permitted.

In addition to the applicable RCRA regulations, incinerators must comply with federal air quality and emissions standards established by EPA under the Clean Air Act. These standards are implemented and enforced primarily by the states.

Differences Between RCRA Permit and Interim Status Regulations

In four areas, the regulations for permitted incinerators significantly exceed those for interim status incinerators: (1) conducting trial burns that meet performance standards, (2) monitoring and recording procedures, (3) analyzing wastes, and (4) using a containment system to store hazardous waste. In all cases, the permit regulations are more comprehensive than the interim status regulations for incinerators. In addition, RCRA's "omnibus" regulation (40 C.F.R. 270.32(b)(2)) states that a RCRA permit may contain conditions that EPA or the authorized state determines necessary to protect human health and the environment.

Appendix I presents a side-by-side comparison to highlight major differences between the two sets of EPA regulations. Appendix II identifies other regulations that are essentially the same for both permitted and interim status incinerators.

Conducting Trial Burns

Under the permit regulations, the owner/operator seeking a permit must conduct trial burns of hazardous waste to show that the incinerator can meet the performance standards for each type of waste it intends to incinerate. Alternatively, the owner/operator may submit information demonstrating that a facility can incinerate the waste with the same results as other acceptable trial burns. Interim status regulations do not contain performance standards for hazardous waste incinerators, and such incinerators may operate without a trial burn, unless they burn dioxin or dibenzofuran wastes.

Specifically, a permitted incinerator must be able to destroy and remove 99.99 percent of the principle organic hazardous components designated in the facility's permit for each waste product. When burning dioxin and dibenzofuran wastes, the incinerator is required to obtain a destruction and removal efficiency of 99.9999 percent. The permitted incinerator must also remove 99 percent of the hydrogen chloride from the stack gas or limit emissions to 4 pounds per hour. Also, the incinerator must limit particulate matter emissions (ash) to 180 milligrams per dry standard cubic meter. According to an EPA hazardous waste incineration expert, these performance standards must be met under a facility's worst case operating conditions.

The operating requirements included in an incinerator's permit are based on the results of a successful trial burn. The permit will specify the composition of the hazardous waste that may be incinerated and the allowable operating limits, such as the combustion temperature. Different waste feeds may be incinerated only if a new permit or permit modification is obtained.

Interim status regulations have only one specific operating requirement. The operator may not feed wastes into an incinerator until it has reached a normal, steady state of operation.

Monitoring and Recording Procedures

Owners/operators of permitted incinerators are required to continuously monitor the combustion temperature, waste feed rate, combustion gas velocity, and carbon monoxide emissions while incinerating hazardous waste. The facility must be equipped with a system to automatically cut off the waste feed to the incinerator if these or other operating conditions deviate from the permit limits. In addition, the facility must maintain records on all the required monitoring activity. EPA and state inspectors are required to review these records periodically.

In contrast, interim status facilities are only required to monitor existing combustion and emissions control instruments every 15 minutes. EPA and state inspectors must periodically check the facility, but the facility's owner/operator is not required to maintain records of monitoring activity.

Analyzing Wastes

Both interim status and permitted facilities are required to analyze hazardous waste prior to incineration. However, the analysis requirements for permitted facilities are more specific and extensive than for interim status facilities.

Permit regulations require the incinerator's owner/operator to analyze the wastes before incinerating them to verify that they are allowable under the facility's permit. According to an EPA hazardous waste incineration expert, an owner/operator of a permitted incinerator usually analyzes the waste before agreeing to accept it from the generator. After the waste arrives on the site, the owner/operator performs a "fingerprint" analysis to verify that the waste received is what the owner/operator agreed to accept.

An interim status facility owner/operator is required to analyze waste for heating value and halogen, sulfur, lead, and mercury content to determine appropriate operating conditions and to identify the pollutants emitted. This analysis is required only for waste that the facility has not incinerated before. The interim status facility does not have to meet any specific standard for waste characteristics, such as viscosity, that permitted incinerators must meet.

Using a Containment System

Both interim status and permit regulations require owners/operators to handle and maintain containers, such as drums, in such a way as to prevent leaks and improper mixing of hazardous wastes. In addition to these regulations, permitted facilities are required to place containers in

a containment system that is capable of containing leaks and spills. The containment system must have an impervious base, a drainage system, extra capacity, and regular overflow removal. However, interim status facilities are not required to have a containment system.

Changes in Hazardous Emissions Standards Since CSI Closed

Section 112 of the Clean Air Act authorized EPA to set hazardous emissions standards for stationary sources, such as incinerators. EPA's hazardous emissions standards were limited to eight pollutants during the years that CSI was in operation. These pollutants were inorganic arsenic, asbestos, benzene, beryllium, mercury, vinyl chloride, coke oven emissions, and radionuclides. According to the EPA Region IV Air Compliance Chief, none of these standards applied to CSI, and EPA had set no hazardous emissions standards for pollutants that were associated with CSI, such as hydrogen chloride. The official also said that the only national standards that applied to CSI were the national ambient air quality standards that addressed the traditional emissions from incinerators, such as particulate matter and sulfur dioxide.[1] North Carolina required owners/operators to perform stack tests to demonstrate that their incinerators could comply with the particulate, visible, and other emissions standards contained in the state's air pollution control regulations.

The Clean Air Act Amendments of 1990 established a list of 190 hazardous air pollutants for regulation under section 112. (App. III lists the hazardous air pollutants before and after the 1990 amendments.) The 1990 amendments also require states to establish an EPA-approved permit program for stationary air pollution sources. Permits issued to incinerators under this program must set specific emissions limits.

The amended Clean Air Act requires EPA to establish emissions standards for the 190 hazardous air pollutants according to a 10-year schedule prescribed in the act. EPA must issue the first set of standards by November 15, 1992, which states are required to implement. Some states established their own standards for hazardous waste pollutants before the Clean Air Act Amendments of 1990. For example, in May 1990 North Carolina established its own emissions control standards for 105 toxic air pollutants, including hydrogen chloride. Additional standards are scheduled to be effective in October 1991.

[1]Under section 108 of the Clean Air Act, EPA set national ambient air quality standards for six pollutants: sulfur dioxide, particulate matter, carbon monoxide, ozone, nitrogen oxides, and lead.

Conclusions

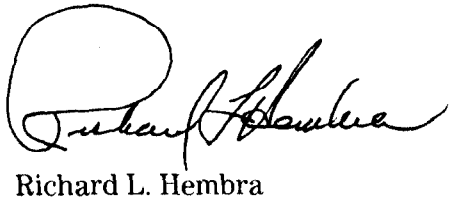
It is clear that incinerators that are following the permit regulations are in a much better position to prevent and delete undesirable environmental impacts than those subject to interim status regulations. Likewise, the Clean Air Act Amendments of 1990 provide for more comprehensive coverage of air-borne pollutants at incinerators than past legislation. As a result, as more incinerators are made subject to these requirements, facilities should be in a better position to provide the desired protection. The implications of CSI being subjected to only the interim status regulations and the less comprehensive clean air regulations are the subject of our forthcoming report.

In developing this information, we reviewed and analyzed the Resource Conservation and Recovery Act and applicable regulations; the Clean Air Act, as amended in 1977, and applicable regulations; the Clean Air Act Amendments of 1990; and North Carolina's Hazardous Waste Management Rules and Administrative Code, title 15A. We also interviewed officials at EPA's Region IV and North Carolina's Department of Environment, Health, and Natural Resources. Our work was conducted from June through July 1991 in accordance with generally accepted government auditing standards. (See app. IV for additional details on our scope and methodology).

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days after the date of this letter. At that time, we will send copies to the appropriate congressional committees; the Administrator, EPA; and the Director, Office of Management and Budget. We will also make copies available to others upon request.

Please contact me at (202) 275-6111 if you or your staff have any questions concerning the report. Major contributors to this report are listed in appendix V.

Sincerely yours,



Richard L. Hembra
Director, Environmental Protection
Issues

Contents

Abbreviations

CFR	Code of Federal Regulations
CSI	Caldwell Systems, Inc.
EPA	Environmental Protection Agency
RCRA	Resource Conservation and Recovery Act
POHC	principle organic hazardous constituent

Differences Between RCRA Interim Status Regulations and Permit Regulations for Hazardous Waste Incinerators

Subject	Interim status regulations (40 C.F.R. 265)	RCRA permit regulations (40 C.F.R. 264)
Waste analysis	265.341. The owner/operator must analyze any waste not previously burned in order to establish steady state operating conditions and to determine the type of pollutants emitted. Analysis must determine heating value, halogen and sulfur content, and lead and mercury content.	264.341. The owner/operator must submit sufficient analysis of waste feed to satisfy trial burn plan requirements or RCRA permit application. This analysis would include heating value, viscosity or physical form, identification of hazardous constituents, and quantification of hazardous constituents. The owner/operator must conduct sufficient waste analysis throughout normal operation to verify that waste feed is consistent with the permit specifications.
Performance standards	265.352. Owners/operators must achieve 99.9999 percent destruction and removal efficiency when burning dioxin and dibenzofuran waste. No other performance standards.	264.343. The incinerator must achieve 99.99 percent destruction and removal efficiency for the principle organic hazardous constituents (POHCs) designated for each waste feed. The incinerator must achieve 99.9999 percent destruction and removal efficiency for dioxin and dibenzofuran waste. Hydrogen chloride emissions are limited to the larger of 4 pounds per hour or 1 percent of stack gas prior to pollution control equipment. Particulate emissions are limited to 180 milligrams per dry standard cubic meter when corrected for oxygen in stack gas. 264.343. Compliance with the operating conditions in the permit is regarded as compliance with the performance standards.
Incinerator permits	No permit required. (Interim status facilities are treated as having been issued a RCRA permit until such time as adminstrative disposition of the permit application is made or interim status is terminated.)	264.344. The RCRA permit for a new hazardous waste incinerator establishes appropriate operating requirements, including allowable waste feeds and operating conditions. The owner/operator may burn only those wastes specified in the permit and only under operating conditions specified for those wastes. The owner/operator may burn other hazardous wastes only after obtaining a new permit (or permit modification). Operating requirements are based upon either trial burn or alternative data submitted with permit application. **40 C.F.R. 270** 270.32(b)(2). RCRA permits shall contain conditions (such as additional performance standards) that the enforcement authority determines necessary to protect human health and the environment.

(continued)

Subject	Interim status regulations (40 C.F.R. 265)	RCRA permit regulations (40 C.F.R. 264)
Operating requirements	265.345. The owner/operator may not feed waste during start-up or shut-down unless the incinerator is in a steady state of operation.	264.345. Operating requirements will be specified in each permit on a case-by-case basis and will be those demonstrated in a trial burn (or with alternate data) as sufficient to comply with the performance standards.
	No other operating requirements.	Operating requirements will specify the composition of the waste feed and acceptable operating limits, including carbon monoxide content of stack gas, waste feed rate, combustion temperature, combustion gas velocity, variation of incinerator design and operation other operating limits necessary to ensure compliance with performance standards Hazardous wastes must not be fed during start-up or shut-down unless the incinerator is operating within the permit conditions. Fugitive emissions must be controlled by specific methods. The incinerator must be able to automatically cut off waste feed to the incinerator if operating conditions deviate from permit requirements. The incinerator must cease operations when changes in waste feed, incinerator design, or operating conditions exceed permit limits.
Incinerator monitoring and inspection	265.347. The owner/operator must monitor existing combustion and emissions control instruments every 15 minutes and make appropriate corrections to maintain steady state operations; and inspect incinerator and associated equipment daily for leaks, spills, fugitive emissions; and check defective emergency controls and alarms to assure proper operation	264.347. The owner/operator must continuously monitor combustion temperature, waste feed rate, and combustion gas velocity; continuously monitor carbon monoxide emissions; sample and analyze waste and exhaust upon request by the enforcement authority; conduct thorough visual inspection of the incinerator and associated equipment daily; and test emergency cut-off system and alarms weekly. Monitoring and inspection records must be kept and placed in operating logs.
Hazardous waste containers	265.171-265.172. The owner/operator must not store hazardous waste in containers that are open, leaking, or will react with the waste.	264.171-264.172. The owner/operator must not store hazardous waste in containers that are open, leaking, or will react with the waste.
	265.173. The owner/operator must not handle the waste in a manner that may rupture the container or cause it to leak.	264.173. The owner/operator must not handle the waste in a manner that may rupture the container or cause it to leak.
	265.177. Incompatible wastes must be adequately separated.	264.177. Incompatible wastes must be adequately separated.

(continued)

Subject	Interim status regulations (40 C.F.R. 265)	RCRA permit regulations (40 C.F.R. 264)
Containment	No containment system required for incinerators.	264.175. Liquid waste container storage areas must have a containment system with an impervious base, a drainage system, extra capacity to contain liquid waste and run-on, and regular overflow removal. The extra capacity must be sufficient to contain either 10 percent of all the containers in the system or the volume of the largest container, whichever is greater. **(40 C.F.R. 270)**
Trial burn	No trial burn required for incinerators, except for those burning dioxin and dibenzofuran waste.	270.19. RCRA permit applicants must submit a trial burn plan or the results of a trial burn demonstrating compliance with RCRA performance standards. 270.19. In lieu of a trial burn, the applicant may submit detailed information demonstrating that the facility can incinerate the waste with the same results of other acceptable trial burns. 270.62. The trial burn plan must include an analysis of the waste, a detailed engineering description of the incinerator, a detailed description of sampling and monitoring procedures, a detailed test schedule, a detailed test protocol, a description of and planned operating procedures for emission control equipment, and procedures for rapidly stopping waste feed. The trial burn must make all appropriate determinations to confirm compliance with performance standards and to establish operating conditions. After conducting the trial burn and analyzing the results, the owner/operator must provide all data to the enforcement authority. The operating requirements in the final permit will be based upon the results of the trial burn.

Other Applicable RCRA Regulations

In addition to the regulations outlined in appendix I, many regulations apply to both RCRA interim status and permit facilities, including incinerators. These standards are essentially the same for both types of facilities, except that permitted facilities are generally subject to additional reporting requirements.

Except as described in appendix I, the following subparts of 40 C.F.R. 264 and 265 contain essentially the same standards:

Subpart B: General Facility Standards;
Subpart C: Preparedness and Prevention;
Subpart D: Contingency Plan and Emergency Procedures;
Subpart E: Manifest System, Recordkeeping, and Reporting;
Subpart F: Groundwater Monitoring/Releases from Solid Waste Management Units[1]
Subpart G: Closure and Post-Closure;
Subpart H: Financial Requirements;
Subpart I: Use and Management of Containers;
Subpart J: Use and Management of Tanks;
Subpart AA: Air Emission Standards for Process Vents; and
Subpart BB: Air Emission Standards for Equipment Leaks

[1]Provisions regarding releases from solid waste management units at interim status facilities are contained in Section 3008(h) of RCRA.

List of Hazardous Pollutants

Under Clean Air Act (Before 1990 Amendments)	Under Clean Air Act Amendments of 1990
Asbestos	Acetaldehyde
Inorganic Arsenic	Acetamide
Benzene	Acetonitrile
Beryllium	Acetophenone
Coke Oven Emissions	2-Acetylaminofluorene
Mercury	Acrolein
Radionuclides	Acrylamide
Vinyl chloride	Acrylic acid
	Acrylonitrile
	Allyl chloride
	4-Aminobiphenyl
	Aniline
	o-Anisidine
	Asbestos
	Benzene
	Benzidine
	Benzotrichloride
	Benzyl chloride
	Biphenyl
	Bis(2-ethylhexyl)-phthalate
	Bis(chloromethyl)ether
	Bromoform
	1,3-Butadiene
	Calcium cyanamide
	Caprolactam
	Captan
	Carbaryl
	Carbon disulfide
	Carbon tetrachloride
	Carbonyl sulfide
	Catechol
	Chloramben
	Chlordane
	Chlorine
	Chloroacetic Acid
	2-Chloroacetophenone
	Chlorobenzene
	Chlorobenzilate
	Chloroform
	Chloromethyl methyl ether
	Chloroprene
	Cresols/Cresylic acid (isomers and mixtures)
	o-Cresol
	m-Cresol
	p-Cresol
	Cumene
	2,4-D, salts and esters
	DDE
	Diazomethane
	Dibenzofurans
	1,2-Dibromo-3-chloropropane
	1,4-Dichlorobenzene(p)
	Dibutylphthalate
	3,3-Dichlorobenzidene
	Dichloroethyl ether (Bis(2-chloroethyl)ether)
	1,3-Dichloropropene

(continued)

Under Clean Air Act (Before 1990 Amendments)	Under Clean Air Act Amendments of 1990
	Dichlorvos
	Diethanolamine
	N,N-Diethyl aniline (N,N,-Dimethylaniline)
	Diethyl sulfate
	3,3-Dimethoxybenzidine
	Dimethyl aminoazobenzene
	3,3, Diethyl benzidine
	Dimethyl carbamoyl chloride
	Dimethyl formamide
	1,1-Dimethyl hydrazine
	Dimethyl phthalate
	Dimethyl sulfate
	4,6-Dinitro-o-cresol, and salts
	2,4-Dinitrophenol
	2,4-Dinitrotoluene
	1,4-Dioxane (1,4-Diethyleneoxide)
	1,2-Diphenylhydrazine
	Epichlorohydrin (1-Chloro-2,3-epoxy propane)1,2
	EpoxybutaneEthyl acrylate
	Ethyl benzene
	Ethyl carbamate (Urethane)
	Ethyl chloride (Chloroethane)
	Ethylene dibromide (Dibromoethane)
	Ethylene dichloride (1,2-Dichloroethane)
	Ethylene glycol
	Ethylene imine (Aziridine)
	Ethylene oxide
	Ethylene thiourea
	Ethylidine dichloride (1,1-Dichloroethane)
	Formaldehyde
	Heptachlor
	Hexachlorobenzene
	Hexachlorobutadiene
	Hexachlorocyclo-pentadiene
	Hexachloroethane
	Hexamethylene-1,6-diisocyanate
	Hexamethylphosphoramide
	Hexane
	Hydrazine
	Hydrochloric acid
	Hydrogen fluoride (Hydrofluoric acid)
	Hydrogen Sulfide
	Hydroquinone
	Isophorone
	Lindane (all isomers)
	Maleic anhydride
	Methanol
	Methoxychlor
	Methyl bromide (Bromomethane)
	Methyl Chloride (Chloromethane)
	Methyl chloroform (1,1,1-Trichloro-ethane)
	Methyl ethyl ketone (2-butanone)
	Methyl hydrazine

(continued)

Under Clean Air Act (Before 1990 Amendments)	Under Clean Air Act Amendments of 1990
	Methyl iodide (Iodomethane)
	Methyl isobutyl ketone (Hexone)
	Methyl isocyanate
	Methyl methacrylate
	Methyl tert butyl ether
	4,4-Methylene bis(2-chloroaniline)
	Methylene chloride (Dichloromethane)
	Methylene diphenyl diisocyanate (MDI)
	4,4-Methylenedianiline
	Naphthalene
	Nitrobenzene
	4-Nitrobiphenyl
	4-Nitrophenol
	2-Nitropropane
	N-Nitroso-N-methylurea
	N-Nitrosodimethylamine
	N-Nitrosomorpholine
	Parathion
	Pentachloronitrobenzene (Quintobenzene)
	Pentachlorophenol
	Phenol
	p-Phenylenediamine
	Phosgene
	Phosphine
	Phosphorus
	Phthalic anhydride
	Polychlorinated biphenyls (Aroclors)
	1,3-Propane sultone
	beta-Propiolactone
	Propionaldehyde
	Propoxur (Baygon)
	Propylene dichloride (1,2-Dichloropropane)
	Propylene oxide
	1,2-Propylenimine (2-Methyl aziridine)
	Quinoline
	Quinone
	Styrene
	Styrene oxide
	2,3,7,8-Tetrachloro-dibenzo-p-dioxin
	1,1,2,2-Tetrachloro-ethane
	Tetrachloroethylene (Perchloroethylene)
	Titanium tetrachloride
	Toluene
	2,4-Toluene diamine
	2,4-Toluene diisocyanate
	o-Toluidine
	Toxaphene (chlorinated camphene)
	1,2,4-Trichlorobenzene
	1,1,2-Trichloroethane
	Trichloroethylene
	2,4,5-Trichlorophenol
	2,4,6-Trichlorophenol
	Triethylamine
	Trifluralin
	2,2,4-Trimethylpentane
	Vinyl acetate
	Vinyl bromide
	Vinyl chloride

(continued)

Under Clean Air Act (Before 1990 Amendments)	Under Clean Air Act Amendments of 1990
	Vinylidene chloride (1,1-Dichloroethylene)
	Xylenes (isomers and mixture)
	o-Xylenes
	m-Xylenes
	p-Xylenes
	Antimony Compounds
	Arsenic Compounds (inorganic including arsine)
	Beryllium Compounds
	Cadmium Compounds
	Chromium Compounds
	Cobalt Compounds
	Coke Oven Emissions
	Cyanide Compounds
	Glycol ethers
	Lead Compounds
	Manganese Compounds
	Mercury Compounds
	Fine Mineral fibers
	Nickel Compounds
	Polycyclic Organic Matter
	Radionuclides (including radon)
	Selenium Compounds

Scope and Methodology

To determine the differences in the RCRA requirements for interim status and permitted incinerators, we reviewed and analyzed the standards contained in 40 C.F.R. parts 264, 265, and 270 concerning incinerators. We also obtained and reviewed EPA's RCRA Manual and hazardous waste incineration resource documents. In addition, we discussed the differences in interim status and permitted incinerators with the Hazardous Waste Combustion Expert at EPA Region IV.

To identify changes in the hazardous emissions standards since 1989, we reviewed and analyzed the following: the Clean Air Act, as amended in 1977, the 1990 Clean Air Act Amendments, and the standards contained in 40 C.F.R. Part 61. We also discussed the standards with the Chief of Air Compliance at EPA Region IV.

To identify the standards North Carolina used to regulate incinerators, we interviewed officials at EPA Region IV and North Carolina's Department of Environment, Health, and Natural Resources. We also obtained and reviewed North Carolina's Administrative Code Title 15A and Hazardous Waste Management Rules.

Our work was conducted primarily from June through July 1991 in accordance with generally accepted government auditing standards. We discussed the contents of this letter with the EPA Headquarters officials and a Hazardous Waste Combustion Expert at EPA Region IV. They agreed with the facts presented, and their suggestions were incorporated in the letter where changes were appropriate.

Major Contributors to This Report

Resources, Community, and Economic Development Division, Washington, D.C.	Peter F. Guerrero, Associate Director Gerald E. Killian, Assistant Director Ned L. Smith, Assignment Manager
Atlanta Regional Office	Octavia V. Parks, Evaluator-in-Charge Harold D. Perkins, Evaluator James B. Michels, Evaluator

Ordering Information

The first copy of each GAO report is free. Additional copies are $2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

U.S. General Accounting Office
P.O. Box 6015
Gaithersburg, MD 20877

Orders may also be placed by calling (202) 275-6241.