ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 444

[FRL–6503–6]

RIN 2040–AC23

Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards for the Commercial Hazardous Waste Combustor Subcategory of the Waste Combustors Point Source Category

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This final rule represents the Agency's first effort to develop Clean Water Act (CWA) effluent limitations guidelines and standards for wastewater discharges from the commercial hazardous waste combustor (CHWC) segment of the waste combustion industry. This rule generally applies to hazardous waste combustion facilities, except cement kilns, regulated as ''incinerators'' or ''boilers and industrial furnaces'' under the Resource Conservation and Recovery Act (RCRA) under certain conditions.

This regulation limits the discharge of pollutants into navigable waters of the United States and the introduction of pollutants into publicly-owned treatment works (POTWs) by existing and new stand-alone CHWCs that incinerate waste received from offsite.

EPA estimates that compliance with this final regulation will reduce the discharge of pollutants by at least 170,000 pounds per year at an estimated annualized cost of $2 million. EPA predicts that the rule will improve water quality for both aquatic life and human health in five streams. EPA also projects that today's rule will reduce sewage sludge contamination associated with discharges from CHWC facilities at POTWs.

DATES: This regulation shall become effective February 28, 2000. The incorporation by reference of test methods listed in § 444.12 is approved by the Director of the Federal Register as of February 28, 2000. In accordance with 40 CFR 23.2, for purposes of judicial review, this rule will be considered promulgated at 1:00 p.m. Eastern time on February 10, 2000.

ADDRESSES: For additional technical information write to: Ms. Samantha Lewis, US EPA, (4303), 401 M Street SW, Washington, DC 20460 or send E-mail to: Lewis.Samantha@epa.gov or call at (202) 260–7149. For additional economic information contact Mr. William Anderson at the address above or send E-mail to: Anderson.William@epa.gov or call at (202) 260–5131.

The complete public record is available for review in the EPA Water Docket, 401 M Street SW, Washington, DC 20460. EPA has assigned the record for this rulemaking docket number W–97–08. The record includes supporting documentation, but does not include any information claimed as Confidential Business Information (CBI). The record is available for inspection from 9 am to 4 pm, Monday through Friday, excluding legal holidays. For access to docket materials, please call (202) 260–3027 to schedule an appointment.

FOR FURTHER INFORMATION CONTACT: For additional technical information contact Ms. Samantha Lewis at (202) 260–7149. For additional economic information contact Mr. William Anderson at (202) 260–5131.

SUPPLEMENTARY INFORMATION:

Regulated Entities

Entities potentially regulated by this action include:

Category	Examples of regulated entities
Industry	Incinerators that discharge directly to or indirectly through publicly owned treatment works to waters of the U.S. and that burn RCRA hazardous wastes received from off-site for a fee or other remuneration (regulated under RCRA, 40 CFR part 264, subpart O or part 265, subpart O (i.e. rotary kiln incinerators, liquid injection incinerators)). Boilers and industrial furnaces (BIFs) that discharge directly to or indirectly through publicly owned treatment works to waters of the U.S. and that burn RCRA hazardous wastes received from off-site for a fee or other remuneration (regulated under RCRA, 40 CFR part 266, subpart H (i.e. boilers, industrial furnaces)).
Federal Govt.	Incinerators that discharge directly to or indirectly through publicly owned treatment works to waters of the U.S. and that burn RCRA hazardous wastes received from off-site for a fee or other remuneration (regulated under RCRA, 40 CFR part 264, subpart O or part 265, subpart O (i.e. rotary kiln incinerators, liquid injection incinerators)). Boilers and industrial furnaces (BIFs) that discharge directly to or indirectly through publicly owned treatment works to waters of the U.S. and that burn RCRA hazardous wastes received from off-site for a fee or other remuneration (regulated under RCRA, 40 CFR part 266, Subpart H (i.e. boilers, industrial furnaces)).[1]

[1] EPA identified no Federal agencies that operate commercial hazardous combustion facilities subject to this regulation. However, Federal agencies that burn RCRA hazardous wastes received from off-site for a fee or other remuneration would be covered by the final regulation.

The preceding table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the applicability criteria in § 444.10 of the final rule and the definitions in § 444.11 of the final rule. If you have questions regarding the applicability of this action to a particular entity, consult one of the persons listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

Compliance Dates

Existing direct dischargers must comply with limitations based on the best practicable technology currently available, the best conventional pollutant control technology, and the best available technology economically achievable as soon as their National Pollutant Discharge Elimination System (NDPES) permit includes such limitations. Existing indirect dischargers subject to today's regulations must comply with the pretreatment standards for existing sources no later than January 27, 2003. New direct and indirect discharging sources must comply with applicable limitations and standards on the date the new sources begin operations.

Supporting Documentation

The final regulations are supported by several major documents:

1. ''Development Document for Final Effluent Limitations Guidelines and Standards for Commercial Hazardous Waste Combustors'' (EPA 821–R–99–020). This Technical Development Document (TDD) presents the technical information that formed the basis for EPA's decisions concerning the final

rule. In it, EPA describes, among other things, the data collection activities following the proposal, the wastewater treatment technology options considered, what pollutants are found in CHWC wastewater and the estimation of costs to the industry to comply with final limitations and standards.

2. ''Economic Analysis of Final Effluent Limitations Guidelines and Standards for Commercial Hazardous Waste Combustors'' (EPA 821–B–99–008).

3. ''Statistical Support Document for Final Effluent Limitations Guidelines and Standards for Commercial Hazardous Waste Combustors'' (EPA 821–B–99–010).

4. ''Environmental Assessment of Final Effluent Limitations Guidelines and Standards for Commercial Hazardous Waste Combustors'' (EPA 821–B–99–009).

How to Obtain Supporting Documents

The Technical Development Document and Economic Analysis will be posted on the Internet, at www.EPA.gov/OST/guide. The documents are also available from the Office of Water Resource Center, MC–4100, U.S. EPA, 401 M Street SW, Washington, DC 20460; telephone (202) 260–7786 for the voice mail publication request.

Organization of This Document

Legal Authority

Legal Authority

EPA is promulgating these regulations under the authority of sections 301, 304, 306, 307, 308, and 501 of the Clean Water Act, 33 U.S.C. 1311, 1314, 1316, 1317, 1318, and 1361.

I. Statutory Background for Effluent Regulations

A. Overview of the Clean Water Act

Congress adopted the Clean Water Act (CWA) to ''restore and maintain the chemical, physical, and biological integrity of the Nation's waters.'' Section 101(a), 33 U.S.C. 1251(a). To achieve this goal, the CWA prohibits the discharge of pollutants into navigable waters except in compliance with the statute. The Clean Water Act attacks the problem of water pollution on a number of different fronts. Its primary reliance, however, is on establishing restrictions on the types and amounts of pollutants discharged from various industrial, commercial, and public sources of wastewater.

Direct dischargers must comply with effluent limitations and new source performance standards. These limitations and standards are established by regulation for categories of industrial dischargers and are based on the degree of control that can be achieved using various levels of pollution control technology. Permits authorizing discharges issued under the National Pollutant Discharge Elimination System must require compliance with these limitations and standards (CWA sections 301(b), 304(b), 306, 307(b)–(d), 33 U.S.C. 1311(b), 1314(b), 1316, and 1317(b)–(d)). In the absence of national effluent limitations and new source performance standards, EPA must establish ''best professional judgement'' limitations and standards on a case-by-case basis before it may issue an NPDES discharge permit.

Congress recognized that regulating only those sources that discharge effluent directly into the nation's waters would not be sufficient to achieve the CWA's goals. Consequently, the CWA requires EPA to promulgate nationally applicable pretreatment standards (for new and existing sources) which restrict pollutant discharges for those who

discharge wastewater indirectly though sewers flowing to publicly-owned treatment works (POTWs) (section 307(b) and (c), 33 U.S.C. 1317(b) and (c)). National pretreatment standards are established for those pollutants in wastewater from indirect dischargers which may pass through or interfere with POTW operations. Generally, pretreatment standards are designed to ensure that wastewater from direct and indirect industrial dischargers are subject to similar levels of treatment. In addition, POTWs are required to implement local treatment limits applicable to their industrial indirect dischargers to satisfy any local requirements (40 CFR 403.5).

B. Statutory Requirements of Regulation

The CWA requires EPA to establish effluent limitations guidelines, pretreatment standards for new and existing sources, and new source performance standards.

1. Best Practicable Control Technology Currently Available (BPT)—Section 304(b)(1) of the CWA

In the guidelines for an industry category, EPA defines the BPT effluent limitations for conventional, priority, and non-conventional pollutants. In specifying BPT, EPA looks at a number of factors. EPA first considers the cost of achieving effluent reductions in relation to the effluent reductions obtained. The Agency also considers the age of the equipment and facilities, the processes employed and any required process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the Agency deems appropriate (CWA 304(b)(1)(B)). Traditionally, EPA establishes BPT effluent limitations based on the average of the best performances of facilities within the industry of various ages, sizes, processes or other common characteristics. Where existing performance is uniformly inadequate, however, EPA may require higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practicably applied.

2. Best Conventional Pollutant Control Technology (BCT)—Section 304(b)(4) of the CWA

The 1977 amendments to the CWA require EPA to identify effluent reduction levels for conventional pollutants associated with BCT technology for discharges from existing industrial point sources beyond the effluent reductions achieved under BPT. In addition to other factors specified in section 304(b)(4)(B), the CWA requires that EPA establish BCT limitations after consideration of a two part ''cost-reasonableness'' test. EPA explained its methodology for the development of BCT limitations in July 1986 (51 FR 24974).

Section 304(a)(4) designates the following as conventional pollutants: biochemical oxygen demand (BOD_5), total suspended solids (TSS), fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease as an additional conventional pollutant on July 30, 1979 (44 FR 44501).

3. Best Available Technology Economically Achievable (BAT)—Section 304(b)(2) of the CWA

In general, BAT effluent limitations guidelines represent the best economically achievable performance of plants in the industrial subcategory or category. The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the process employed, potential process changes, and non-water quality environmental impacts, including energy requirements. The Agency retains considerable discretion in assigning the weight to be accorded these factors.

4. New Source Performance Standards (NSPS)—Section 306 of the CWA

NSPS reflect effluent reductions that are achievable based on the best available demonstrated treatment technology. New facilities have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. As a result, NSPS should represent the most stringent controls attainable through the application of the best available control technology for all pollutants (*i.e.,* conventional, nonconventional, and priority pollutants). In establishing NSPS, EPA is directed to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements.

5. Pretreatment Standards for Existing Sources (PSES)—Section 307(b) of the CWA

The CWA requires EPA to establish pretreatment standards to prevent pollutants passing through POTWs or interfering with POTW operations. EPA determines whether a pollutant passes through a POTW by comparing BAT removals of the pollutants at direct discharging facilities. The preamble to the proposal explains this. See 63 FR at 6405–06. As explained above, EPA develops BAT limitations by considering a number of factors, including the availability and feasibility of use of the treatment technology, pollutant removals, and its cost to dischargers. Section 304(b)(2) of the CWA. EPA evaluates the same factors in establishing pretreatment standards as it considers when it develops BAT limitations (A Legislative History of the Clean Water Act Amendments of 1977, H.R. Rep. No. 830, 95th Cong. 1st Sess., 271 (1978)). Pretreatment standards are technology-based and analogous to BAT effluent limitations. Pretreatment standards also must be economically achievable on a national basis to the industry category.

PSES are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs, including interfering with sludge disposal methods.

The General Pretreatment Regulations, which set forth the framework for the implementation of categorical pretreatment standards, are found at 40 CFR part 403. Those regulations require POTWs to establish pretreatment standards to address local passthrough and establish pretreatment standards that apply to all non-domestic dischargers. See 52 FR 1586, January 14, 1987.

6. Pretreatment Standards for New Sources (PSNS)—Section 307(b) of the CWA

Like PSES, PSNS are designed to prevent the discharges of pollutants that pass-through, interfere-with, or are otherwise incompatible with the operation of POTWs. PSNS are to be issued at the same time as NSPS. New indirect dischargers have the opportunity to incorporate into their plants the best available demonstrated technologies. The Agency considers the same factors in promulgating PSNS as it considers in promulgating NSPS.

C. CWA Section 304(m) Requirements

Section 304(m) of the Act (33 U.S.C. 1314(m)), added by the Water Quality Act of 1987, requires EPA to establish schedules for (1) reviewing and revising existing effluent limitation guidelines and standards (''effluent guidelines''), and (2) promulgating new effluent guidelines. On January 2, 1990, EPA published an Effluent Guidelines Plan (55 FR 80), that included schedules for developing new and revised effluent guidelines for several industry categories. One of the industries for

which the Agency established a schedule was the ''Hazardous Waste Treatment, Phase II'' Category. EPA subsequently changed the category name ''Hazardous Waste Treatment, Phase II'' to ''Landfills and Incinerators.''

The Natural Resources Defense Council, Inc. (NRDC) and Public Citizen, Inc. challenged the Effluent Guidelines Plan in a suit filed in U.S. District Court for the District of Columbia (*NRDC et al* v. *Reilly,* Civ. No. 89–2980). Under the terms of the consent decree, EPA agreed, among other things, to propose effluent guidelines for the ''Landfills and Incinerators'' category by November 1997 and to take final action by November 1999. Although ''Landfills and Incinerators'' is listed as a single entry in the Consent Decree schedule, EPA proposed two separate rulemaking actions in the **Federal Register**, both on February 6, 1998. In order to reflect the fact that the effluent limitations guidelines and standards to be proposed would apply only to a segment of the waste combustion industry, EPA changed the name of the proposed regulation from ''Incinerators'' to ''Industrial Waste Combustor'' regulations prior to the proposal. In order to reflect accurately the segment of the combustion industry being regulated today, EPA has now changed the name for this final regulation to ''Commercial Hazardous Waste Combustor'' regulations.

II. Background on the Industry and Prior Regulations

A. Updated Profile of the Industry

The universe of incineration facilities currently in operation in the United States is broad. These include municipal waste combustors that burn household and other municipal trash and incinerators that burn hazardous wastes. Among other types of incinerators burning waste material are those that burn medical wastes exclusively and sewage sludge incinerators that burn residual solids from wastewater treatment at POTWs. In addition, some boilers and industrial furnaces may also burn waste materials for fuel.

While many industries began incinerating some of their wastes as early as the late 1950's, the current market for waste combustion (particularly combustion of hazardous wastes) is essentially a creature of the Resource Conservation and Recovery Act (RCRA) and EPA's resulting regulation of hazardous waste disposal. For more information on the development of the industry, see the preamble to the proposed guideline at 63 FR 6392, 6395 (February 6, 1998).

Today's rule establishes national effluent limitations and pretreatment standards for a segment of the waste combustion industry—''commercial hazardous waste combustors.'' The segment of the universe of incineration units for which EPA has adopted regulations includes units which operate commercially and which use controlled flame combustion in the treatment or recovery of energy values from hazardous industrial waste. For example, industrial boilers, industrial furnaces, rotary kiln incinerators and liquid-injection incinerators are all types of units included in the Commercial Hazardous Waste Combustors Subcategory.

Thermal treatment or recovery operations at these facilities generate the following types of wastewater: Air pollution control wastewater, flue gas quench wastewater, truck/equipment wash water, container wash waster, laboratory drain wastewater, and floor washings from process areas. Section 4 of the TDD describes these more fully. Typical non-wastewater by-products of thermal treatment or recovery operations may include: Slag or ash developed in the thermal unit itself, and emission particles collected using air pollution control systems. There are many different types of air pollution control systems in use by thermal units. The types employed by thermal units include, but are not limited to, the following: Packed towers (which use a caustic scrubbing solution for the removal of acid gases), baghouses (which remove particles and do not use any water), wet electrostatic precipitators (which remove particles using water but do not generate a wastewater stream), and venturi scrubbers (which remove particles using water and generate a wastewater stream). Thus, the amount of wastewater and types of wastewater generated by a thermal unit are directly dependent upon the types of air pollution control systems employed by the thermal unit.

The Agency estimates that there are approximately 55 Commercial Hazardous Waste Combustor facilities that are potentially subject to the rule. These include rotary kiln incinerators, liquid injection incinerators, fluidized-bed incinerators, multiple-hearth incinerators, fixed-hearth incinerators, industrial boilers, industrial furnaces, and other types of thermal units. These do not include cement kilns, since EPA specifically exempts cement kilns from this final rule. Of these 55 facilities, approximately 33 facilities do not generate any wastewater that EPA is regulating under this final rule. Twelve of these facilities generate CHWC wastewater but do not discharge the wastewater to a receiving stream or POTW. These ''zero or alternative'' dischargers use a variety of methods to dispose of their wastewater. At these facilities, (1) wastewater is sent off-site for treatment or disposal (four facilities); (2) wastewater is burned or evaporated on site (four facilities); (3) wastewater is sent to a surface impoundment on site (three facilities); and (4) wastewater is injected underground on site (one facility).

For the final rule, EPA identified only 10 facilities that were discharging CHWC wastewater to a receiving stream or introducing wastewater to a POTW. Of these 10 facilities, two facilities have, since 1992, either stopped accepting waste from off site for combustion or have closed their combustion operations.

B. Proposed Rule

1. Proposal

On February 6, 1998 (63 FR 6391), EPA proposed limitations and standards for the Commercial Hazardous Waste Combustor Industry. The proposal applied to existing and new stand-alone industrial waste combustors that burned hazardous and non-hazardous wastes received from offsite. The proposed guidelines and standards would not have applied to wastewater discharges from industrial waste combustors that only burned wastes generated on-site at the industrial facility or generated at facilities under common corporate ownership. The principal source of regulated wastewater under the proposal was air pollution control wastewater. The comment period for the proposal closed on May 7, 1998. EPA received comments from 39 interested stakeholders.

2. Notice of Data Availability

On May 17, 1999 (64 FR 26714), EPA published a Notice of Data Availability related to the proposed limitations and standards for the Commercial Hazardous Waste Combustor industry. This notice solicited comments on new wastewater treatment system performance data from three Commercial Hazardous Waste Combustor facilities. EPA received this new performance data in early 1999, subsequent to the close of the comment period for the proposal.

Three CHWCs submitted influent and effluent wastewater treatment system performance data and related information on the operation of their

treatment systems. Each facility submitted daily measurements for chlorides, total dissolved solids, total suspended solids, sulfate, pH, and 15 metals (aluminum, antimony, arsenic, cadmium, chromium, copper, iron, lead, mercury, molybdenum, selenium, silver, tin, titanium and zinc). One facility provided 11 days of sampling data, and the two other facilities provided 30 days of sampling data each. The comment period for the notice closed on June 16, 1999. EPA received comments from 4 interested stakeholders.

C. Related Regulations—Hazardous Waste Combustion Regulation Promulgated September 30, 1999

The preamble to the proposal discusses a number of EPA regulatory efforts affecting the waste combustion industry, including a proposal to establish standards for hazardous waste combustion. 63 FR at 6395–96. Recently, under the joint authority of the Clean Air Act (CAA) and the Resource Conservation Recovery Act (RCRA), EPA promulgated the Hazardous Waste Combustion (HWC) MACT (64 FR 52828, September 30, 1999). These final regulations apply to the following types of combustors:

- RCRA Incinerators (as defined in 40 CFR 260.10).
- RCRA Cement Kilns and RCRA Lightweight Aggregate Kilns (as defined in 40 CFR 260.10 under the Industrial Furnace definition).

These regulations do not apply to:

- RCRA Boilers and Industrial Furnaces (other than Cement Kilns and Lightweight Aggregate Kilns, as defined in 40 CFR 260.10).

The HWC regulations establish stack emission limits for several hazardous air pollutants (HAPs). Under the Clean Air Act, these limits must require the maximum achievable degree of emission reductions of HAPs, taking into account the cost of achieving such reductions and non-air quality health and environmental impacts and energy requirements—so-called Maximum Achievable Control Technologies (MACT) standards. The HWC regulation does not set limits on the water effluents from the air pollution control systems (APCS) (like wet scrubbers, quench systems). As a result of promulgation of these standards, it is likely that some facilities using dry air pollution control, not presently generating wastewater, may switch to using wet APCS.

III. Summary of Significant Changes Since Proposal

This section describes the most significant changes to the rule since proposal. Many of these changes result from EPA consideration of the comments submitted on the proposal. Section X below discusses the most significant of these. EPA's responses to all the comments provides more detailed explanations for changes. The record for the final rule includes these responses.

A. EPA Limited the Scope of the Final Guidelines to Waste Combustors that Burn Hazardous Waste

Today's final rule does not apply to industrial waste combustors that do not burn hazardous waste. EPA had proposed to regulate both hazardous and non-hazardous waste combustors. EPA received comments questioning whether its data collection effort was complete enough to allow EPA to characterize non-hazardous industrial waste combustor facilities and develop limitations and standards for such facilities. Examples of non-hazardous industrial waste burned by waste combustors include: tire-derived fuels, alternative fuels, recycled manufactured products and reclaimed materials.

The data examined by EPA as well as information supplied by commenters supports the conclusion that the pollutant profile of scrubber water for non-hazardous industrial waste combustors burning alternative fuels will exhibit significant variation depending on the type of fuels burned. The variation will range from scrubber water containing few, if any, pollutants of potential concern to facilities whose scrubber water may more closely resemble that of hazardous waste combustion practices. EPA determined that, in order to develop appropriate limitations and standards, EPA would need to consider multiple subcategories, based on the different fuels burned before it could regulate these facilities. This effort would require information that the Agency currently lacks.

At this time, EPA's Office of Air and Radiation is exploring the development of MACT CAA standards for industrial commercial waste incineration. They have identified four potential subcategories for regulation: wood and other biomass waste incinerators, pathological waste incinerators, drum and parts reclaimer incinerators, miscellaneous industrial and commercial waste incinerators. EPA may consider taking a second look at these facilities for wastewater regulation, following development of the MACT standards.

The CHWC regulation focuses on RCRA combustor units and includes units that burn both RCRA and non-RCRA wastes. If a combustor does not burn any RCRA hazardous waste, it is not subject to the rule. The regulation will apply to the CHWC wastewater produced by burning non-hazardous industrial wastes in conjunction with RCRA hazardous waste.

B. The Final Guidelines Do Not Apply to Hazardous Waste Combustors Exempt From RCRA

In today's final rule, EPA is clarifying the proposal regarding incinerators and BIFs regulated under RCRA. EPA proposed to regulate only ''commercially-operating hazardous waste combustor facilities regulated as 'incinerators' or 'boilers and industrial furnaces' under RCRA.'' EPA based its decision to limit the scope of the guidelines, in part, on its determination that wastewater from these exempt facilities would be qualitatively different from the regulated wastewater. However, EPA failed to make it clear that it was not proposing to regulate facilities that are granted exemptions from 40 CFR part 264, subpart O; part 265, subpart O; or part 266, subpart H. The applicability provisions of the final guideline make it clear that the rule does not apply to those exempted facilities. One example of a facility of this type is a facility that is conditionally exempt from regulation as a RCRA BIF under 40 CFR 266.100(c).

C. The Final Guidelines Do Not Apply to the Burning of Waste that Is Received From Off Site for No Fee or Other Remuneration

In today's final rule, EPA is not regulating hazardous waste combustors (HWCs) that only take waste from off-site (from facilities not under the same corporate structure) for no fee or other remuneration. At proposal, EPA had included waste burned from off-site for a fee or other remuneration in the scope of the rule. Examples of ''not-for-fee'' activities include wastes burned as a public service and product stewardship activities.

As explained in greater detail below, EPA decided it would not include captive or intra-company HWCs within this guideline so long as the combustors did not burn off-site wastes generated at a facility not under the same corporate structure or subject to the same ownership. A captive or intra-company HWC would still not be subject to the guideline if it burned off-site waste generated at a facility not under the same ownership so long as the wastes are similar to the wastes being generated on-site. EPA's review of data on captive facilities showed that permit writers regulated captive scrubber water either through specific guideline limitations or by developing BPJ limitations that

generally paralleled the limitations for the associated industrial process wastewater. The apparent reason for this is that if the incinerator is burning on-site industrial waste or similar waste, then the pollutant profile of its scrubber water would include many of the same pollutants seen in wastewater from its industrial operations. Given the small quantity of scrubber water and commingled treatment, applying the same requirements to scrubber water would be appropriate.

EPA concluded that the quantity of wastes burned on a ''not-for-fee'' basis was unlikely to be great for such captive and intra-company facilities. In those circumstances, the burning of such waste was not likely to change the character of the scrubber water for these combustors significantly. In these circumstances, the same reasoning that supported not including these combustors in this guideline would still apply.

D. EPA Has Excluded Cement Kilns From the Scope of the Guidelines

EPA is not including cement kilns within the scope of the CHWC guidelines for several reasons. Although EPA proposed to include cement kilns in the scope of this rule, EPA's survey identified no cement kilns that are currently discharging scrubber water or other wastewater that is potentially subject to the CHWC guidelines. In the absence of detailed information on the wastes burned in these kilns, wastewater characterizations, and treatment effectiveness, EPA is not applying the final limitations and standards to cement kilns.

EPA learned, as part of its analysis for the final rule, that there may be a cement kiln considering the installation of wet scrubbers in order to comply with the Hazardous Waste Combustor MACT. (See discussion on this MACT final rule above at Section II.C.) In the event that a cement kiln burning hazardous waste switched from a dry to wet scrubber, EPA would expect it to produce scrubber water with a pollutant profile very similar to those wastestreams regulated here as CHWC wastewater. In those circumstances, NPDES permit writers should consider whether they will need to establish BPJ limitations or local control authorities may need to establish local limits to control discharges of toxic pollutants in the scrubber water. Permit writers should compare cement kiln scrubber wastewater with the information provided in the TDD concerning the characteristics of CHWC wastewater to determine whether similar discharge limitations should be established.

In EPA's view, thermal operations burning hazardous wastes that use wet emissions control equipment will generally result in wastewater with similar pollutant profiles. This conclusion is supported by the data EPA has collected. Thus, EPA's wastewater data included data from wet emission control equipment at thermal operations burning hazardous waste exclusively as well as operations that burned hazardous waste as a fuel for other industrial operations such as acid regeneration. As EPA expected, the wastewater included extremely low levels of organic pollutants which are largely destroyed in the combustion process. EPA did find present a number of metals at treatable levels. Permit writers and local control authorities should carefully examine cement kiln emission control wastewater to see if it also contains metal pollutants when the permit writer establishes case-by-case limitations under NPDES regulations at 40 CFR 125.(3) or the control authority establishes local limits under the General Pretreatment Regulations at 40 CFR 403.5.

EPA has established limitations and standards for cement manufacturers at 40 CFR part 411. Among these limitations and standards are discharge limits for cement kilns which use water in wet scrubbers to control kiln stack emissions. While the part 411 regulations include BPT/BAT limitations, they only limit conventional pollutants and temperature. There are no pretreatment standards for indirect dischargers and no BAT limitations to control the discharge of toxic pollutants from these facilities. Consequently, the permit writer or local control authority must include technology-based limits for any toxic pollutant which is or may be discharged at a level greater than the level which can be achieved by treatment requirements appropriate to the permittee or which may pass through or interfere with POTW operations (40 CFR 122.44(e), 125.3. *See also* 40 CFR 403.5(c) which requires the establishment of local limits in a POTW pretreatment program for any pollutant which may cause pass through or interference). The presence of metal pollutants in scrubber water would likely trigger these requirements.

E. EPA Used Additional Data To Calculate the Final Limitations and Standards

As described in the Notice of Availability on May 17, 1999 (64 FR 26714), EPA received influent and effluent data from three CHWC facilities following proposal of the regulation. Commenters supported the use of this data in the development of the final CHWC limitations and standards. Following an evaluation of the three facilities, EPA determined that two of the three facilities employed effective treatment. EPA used data from these two facilities as follows. The concentrations of pollutants in the treated effluent from these two additional facilities are higher for some pollutants and lower for others, as compared to the facility used to develop limitations and standards for the proposal. EPA used the new pollutant concentration data for the final rule. EPA did not rely on data from the two additional facilities to calculate variability factors. For both facilities, the average variability of the effluent concentrations was lower than the average variability of the effluent concentrations used to calculate the proposed limitations and standards. EPA used only the variability factors calculated from the facility it used at proposal to calculate the final limitations and standards. The variability factors calculated using the proposal data better reflect the variability seen in waste receipts at CHWCs.

F. Change in Technology Basis of Limitations and Standards Due to Expanded Data Set

Based on the new data received and analyzed by EPA following proposal, EPA has changed the technology basis for PSES and BPT/BAT (noted this way because the BPT and BAT limitations are equivalent). For the final rule, PSES and BPT/BAT are based on chromium reduction (as necessary) followed by two stages of chemical precipitation with (or without) sand filtration. EPA developed the final limitations and standards using sampling data from facilities both with and without a final sand filtration step. The data show that filtration may or may not be necessary to meet the final limitations, depending upon the level of treatment provided in the initial two stages of chemical precipitation. EPA costed the limitations and standards with sand filtration, however, to ensure its economic achievability.

G. Change in Regulation Name

EPA changed the name of this regulation from ''Industrial Waste Combustors'' to ''Commercial Hazardous Waste Combustors.'' This change reflects the changes made in the scope of the project from proposal to promulgation. Specifically, EPA is regulating only hazardous, rather than all industrial, waste combustors for the final regulation (see Section IV.A.

above). Also, EPA is regulating only facilities which receive waste for a fee or other remuneration, rather than all facilities that take waste from off-site from facilities not under their same corporate structure, regardless of whether a fee is charged (see Section IV.C above).

H. RCRA Permit Modification Costs Removed

In the proposed regulation, EPA included RCRA permit modification capital costs as one component of the total proposed capital costs. This was an error. The wastewater treatment unit exemption at 40 CFR 264.1(g)(6) and 40 CFR 265.1(c)(10) and 40 CFR 270.1(c)(2)(v) exempts, from certain RCRA requirements, wastewater treatment units at facilities that are subject to the NPDES or pretreatment requirements under the Clean Water Act. Thus, CHWC facilities would not need to modify their RCRA permits as a result of this rule and would not incur these RCRA permit modification costs. The final rule does not include these RCRA permit modification costs.

IV. The Final Commercial Hazardous Waste Combustor Regulation

This section discusses the scope of the final rule, the treatment options that EPA considered for development of the final limitations and standards and the rationale for the Agency's selected options for BPT, BCT, BAT, PSES, PSNS, and NSPS.

A. Scope of the Final Rule

Today's final effluent limitations guidelines and pretreatment standards cover pollutants only in discharges of specified wastewater from new and existing Commercial Hazardous Waste Combustor facilities. Based on its consideration of comments, EPA has narrowed the scope of the final rule to commercial hazardous waste combustors, rather than industrial waste combustors, as proposed.

As explained in Section III.G, EPA now defines the regulated facilities as Commercial Hazardous Waste Combustors (CHWCs). A CHWC is any thermal unit, except a cement kiln, that is subject to either to 40 CFR part 264, subpart O; part 265, subpart O; or part 266, subpart H if the thermal unit burns RCRA hazardous wastes received from off-site for a fee or other remuneration in the following circumstances. The thermal unit is a commercial hazardous waste combustor if the off-site wastes are generated at a facility not under the same corporate structure or subject to the same ownership as the thermal unit and (1) the thermal unit is burning wastes that are not of a similar nature to wastes being burned from industrial processes on site, or (2) there are no wastes being burned from industrial processes on site. Examples of wastes of a ''similar nature'' may include the following: wastes generated in industrial operations whose wastewaters are subject to the same provisions in 40 CFR Subchapter N (Part 400 to 471) or wastes burned as part of a product stewardship activity.

The term ''commercial hazardous waste combustor'' includes the following facilities: a facility that burns exclusively waste received from off-site; and, a facility that burns both wastes generated on-site and wastes received from off-site. Facilities that may be commercial hazardous waste combustors include hazardous waste incinerators, rotary kiln incinerators, lime kilns, lightweight aggregate kilns, and boilers.

A facility not otherwise a commercial hazardous waste combustor is not a commercial hazardous waste combustor if it burns RCRA hazardous waste for charitable organizations, as a community service or as an accommodation to local, state or government agencies so long as the waste is burned for no fee or other remuneration. Thermal units that only burn non-hazardous industrial waste are no longer in the scope of this guideline, based on EPA's assessment of public comments.

The scope of wastewater regulated for the final rule remains the same as proposed. CHWC wastewater means water used in air pollution control systems or water used to quench flue gas or slag generated as a result of commercial hazardous waste combustion operations. Most of the wastewater generated by Commercial Hazardous Waste Combustor operations result from these three sources.

As proposed, EPA is not including within the scope of the rule those hazardous waste combustors that burn only wastes received from off-site facilities within the same corporate ownership (intracompany wastes) or hazardous waste combustors that only burn wastes generated on-site. Thus, facilities which only burn waste from off-site facilities under the same corporate structure (an intracompany facility) and/or only burn waste generated on-site (captive facility) are not regulated under these guidelines.

EPA received comments that claim that the Agency's proposal not to apply the guidelines to intracompany facilities would mean that as many as several thousand on-site and intracompany facilities would not be subject to the rule, without assurances other comparable categorical standards would apply to the wastewaters discharged by such facilities. EPA also received comments that the universe of commercial waste combustors covered by the rule is narrow considering the magnitude of the total pollutant loadings from the whole IWC industry. The comments state that EPA is ignoring the majority of pollutants discharged from combustion sources by excluding captive and intracompany sources.

EPA has concluded that its decision to limit the scope of this regulation to a narrow universe of combustion operations is well-supported by the record. From the information developed by the Agency for this rulemaking and confirmed by comments on the proposal, EPA has concluded that the combustor wastewater generated by captive and intra-company hazardous waste combustors operated in conjunction with, and receiving the bulk of their waste from, associated industrial or commercial operations are currently subject to effluent guideline limitations for other point source categories either explicitly through the guideline or through permit writer-developed BPJ limitations. In some cases, EPA specifically considered scrubber water as a wastewater source in developing guidelines and thus scrubber water is a specifically regulated stream. In other cases, industrial operations with associated combustors commingle scrubber water with other industrial wastewater for treatment. In these circumstances, permit writers are applying the applicable industrial guideline to the scrubber water through BPJ limitations because of the small volumes of scrubber water and the similarity of the metals profile of the scrubber water to that of other wastewater being treated.

The record shows the great bulk of wastewater discharges from captive and intracompany combustion operations are in fact being regulated under industry-specific guidelines. EPA has based those guidelines on data that are specific to the particular industrial processes being conducted on-site. Those guidelines regulate the appropriate range of pollutants associated with the on-site industrial processes. As a consequence, these pollutants are likely constituents of the waste being burned. In fact, many existing effluent guidelines specify air pollution control wastewaters (APC) as an ''in-scope'' wastewater (e.g., Organic Chemicals, Plastics and Synthetic Fibers category and Pharmaceutical Manufacturing category). The preamble to the proposal provided detailed

information on 156 captive and intracompany facilities receiving EPA's screener survey that are covered by existing categorical standards. (63 FR 6392 at 6415). EPA has updated this information. Rather than 107 facilities as reported at proposal, EPA has now determined that 140 out of the 156 facilities are subject to existing categorical standards. There are 97 facilities subject to the Organic Chemicals, Plastics, and Synthetic fibers category (40 CFR part 414), 17 facilities subject to the Pharmaceutical category (40 CFR part 439), 16 facilities subject to the Steam Electric Power Generating category (40 CFR part 423), 3 facilities subject to the Pesticide Manufacturing category (40 CFR part 455), and 7 subject to other categories. EPA could not identify an effluent guidelines category for 16 of these 156 facilities (five of these are federal facilities). Moreover, in the case of the small number—less than 10 percent—for which EPA could not identify a specific guideline that would apply, the permit writer has ample authority to obtain any necessary data to write facility-specific BPJ limitations or standards.

In addition, EPA looked at the pollutant data for commercial and non-commercial hazardous facilities and concluded that their scrubber water is qualitatively different. EPA evaluated the grab samples of untreated scrubber water it collected from eight non-commercial facilities to determine if there was a difference in wastewater characteristics at non-commercial versus commercial facilities. For each regulated pollutant, the average untreated IWC wastewater concentration is less for the eight non-commercial facilities than for the three commercial facilities used to determine the final limitations. EPA concluded this results from the fact that non-commercial facilities do not take the large variety of different wastes that commercial facilities do. Additionally, two of the nine regulated metal pollutants (mercury and silver) were not at treatable levels for any of the eight non-commercial facilities. Two more of the nine regulated metal pollutants (arsenic and cadmium) were at treatable levels at only one of the eight non-commercial facilities. Further, only one of the nine regulated metal pollutants (zinc) was at treatable levels at more than half of the eight non-commercial facilities. In contrast, seven of the nine regulated metal pollutants (arsenic, cadmium copper, lead, mercury, titanium and zinc) were found at treatable levels at all three of the commercial facilities used to determine the final limitations. Further, the remaining two metal pollutants (chromium and silver) were found at treatable levels at two of these three commercial facilities. These circumstances further support EPA's decision not to subject non-commercial, captive hazardous incinerators to the limitations and standards developed here.

There may be instances when a combustor is operated in conjunction with on-site industrial activities and the combustor wastewater is treated and discharged separately from the treatment of industrial wastewater (or treated separately and mixed before discharge). Permit writers should consider this guideline as one source of information when developing limitations and standards for these situations.

Therefore, EPA determined that it has appropriately balanced coverage of the guidelines without imposing limitations on thermal units already adequately regulated under existing guidelines. Given the circumstances reviewed above, EPA concluded that there is not likely to be any significant regulatory gap in the treatment of combustor wastewater.

B. BPT/BCT/BAT/PSES

a. Summary of Technology Basis

For this final rule, EPA is promulgating BPT, BCT, BAT, and PSES (BPT/BCT/BAT/PSES) limitations and standards based on the same wastewater treatment technology. EPA proposed BPT limitations for nine priority and non-conventional metal pollutants, TSS, and pH when discharged from Commercial Hazardous Waste Combustor facilities. EPA proposed BCT limitations equivalent to BPT because it did not identify any more stringent technology for the control of conventional pollutants. EPA proposed BAT limitations equivalent to BPT because it did not identify any more stringent technology option that it considered would represent BAT levels of control. EPA proposed PSES for nine priority and non-conventional metal pollutants. EPA proposed BPT/BCT/BAT based on two stages of chemical precipitation followed by sand filtration. EPA proposed PSES based on two stages of chemical precipitation, with no sand filtration as the final step.

EPA has based the final BPT/BCT/BAT/PSES limitations and standards on the same treatment technologies it had considered at proposal with one modification. The technology forming the basis of the final limitations and standards is two-stage chemical precipitation with and without sand filtration as a final step. See 63 FR at 6404.

b. Rationale for BPT/BCT/BAT/PSES Limitations and Standards

Based on a thorough analysis of the sampling data and public comments, EPA considered only one option for the final BPT/BCT/BAT/PSES limitations. EPA concluded that a two-stage precipitation process with or without a sand filtration polishing step provided the greatest overall pollutant removals at a cost that is economically achievable at most commercial hazardous waste combustion facilities. Consequently, EPA has based the final limitations on this treatment technology (Option 1), consisting of chromium reduction (as necessary), primary precipitation, solid-liquid separation, secondary precipitation, and solid-liquid separation with (or without) sand filtration.

EPA has based BPT/BCT/BAT/PSES limitations upon two stages of chemical precipitation, each followed by some form of separation and sludge dewatering. The pH levels used for chemical precipitation vary to promote optimal removal of metals because different metals are preferentially removed at different pH levels. In addition, chromium reduction precedes the first stage of chemical precipitation, when necessary. In some cases, BPT/BCT/BAT/PSES limitations would require the current treatment technologies in place to be improved by use of increased quantities of treatment chemicals and additional chemical precipitation/sludge dewatering systems. Sand filtration is employed at the end of the treatment train, if necessary.

In response to the proposal, EPA received comments claiming that carbon and other adsorptive media, including filtration technologies, would be more appropriate than sand filtration for treating waste streams likely to contain mercury. EPA did not include sand filtration system in the model treatment technology specifically to remove mercury, but, rather as a polishing step to help remove TSS and metals associated with fine precipitate particles. In addition, EPA finds that sand filtration is effective in removing mercury. EPA did investigate the use of Lancy filtration and carbon adsorption during the sampling conducted at one facility. EPA found that the removals for mercury at that facility were lower (88.6 percent) than those at the model plant (99.1 percent) whose data formed the basis for the BPT limitations. Although the influent mercury concentration was

an order of magnitude greater at the model facility (21.4 μg/l) compared to the facility using Lancy filtration (3.3 μg/l), the final effluent concentration was lower (non-detect, 0.2 μg/l detection limit) than it was at the second plant (0.4 μg/l). EPA has found that the treatment performance of activated carbon is sometimes unreliable due to the competitive adsorption and desorption of different pollutants that have different affinities for adsorption on activated carbon. Also, pH changes of the wastewater going through the carbon system may cause stable metal complexes to dissolve and thus cause an increase in some metals concentrations through the carbon system. The sampling data for the facility using Lancy filtration shows this. There, the concentration of several metallic pollutants increased across the activated carbon treatment system (see Table 6–4 of the TDD; specifically selenium, antimony, and boron as examples). Thus, the final technology basis includes sand filtration.

The Agency has concluded that this treatment system represented the best practicable technology currently available and should be the basis for the BPT limitations for the following reasons. First, the demonstrated effluent reductions attainable through this control technology represent performance that may be achieved through the application of demonstrated treatment measures currently in operation in this industry. Three facilities containing the identified BPT technology were used in the database to calculate the effluent limitations. This database reflects technology and removals readily applicable to all facilities. Second, the adoption of this level of control would represent a significant reduction in pollutants discharged into the environment (approximately 94,000 pounds of TSS and metals). Third, the Agency assessed the total cost of water pollution controls likely to be incurred, in relation to the effluent reduction benefits and found those costs were reasonable.

Although EPA is not changing the technology basis significantly, EPA is revising all BPT/BCT/BAT/PSES limitations and standards. EPA has based the final BPT/BCT/BAT/PSES effluent limitations and standards on data from the CHWC facility used in the development of the proposed IWC limitations as well as data from two other CHWC facilities that submitted sampling data to EPA (See 64 FR 26714, May 17, 1999) following proposal of the IWC rule. See Section III.E above.

As previously noted, EPA proposed BAT equal to BPT for all non-conventional and priority pollutants for which it had proposed BPT limitations. EPA did consider and reject zero discharge as a possible BAT technology at proposal. EPA concluded that it should not promulgate zero discharge requirements for the following reasons.

EPA determined that combustors have two main options for achieving zero discharge—off-site disposal or on-site incineration. Facilities will likely choose off-site disposal where the cost of on-site incineration is greater than the cost of off-site disposal. But off-site disposal ultimately results in some pollutant discharge to surface waters which will exceed the level achieved by BPT unless the limitations and standards applicable to the off-site treater are equivalent to today's guideline. EPA is concerned that adopting a BAT zero discharge requirement may, in actuality, result in fewer effluent reductions than expected from today's limitations and standards. The second option for zero discharge is on-site. In this case, a facility must either incinerate its scrubber water or replace its wet scrubbing system with a dry scrubber. EPA has determined that on-site incineration would be more expensive than off-site disposal and therefore result in off-site treatment. Similarly, EPA believes, but cannot confirm, that the cost of changing air pollution control systems is probably so high that a combustor would send its scrubber water off-site for treatment. Moreover, even if the cost is not greater, EPA found that replacement of wet scrubbing systems with dry scrubbers may result in an unstable solid (as opposed to the stable solids generated in wastewater treatment systems) that must be disposed of in a landfill, with potentially adverse, non-water quality effects. Consequently, EPA determined that zero discharge is not, in fact, the best available technology. EPA is promulgating BAT limitations equal to the BPT limitations for the non-conventional and priority pollutants covered under BPT.

EPA proposed BCT equal to BPT for all conventional pollutants covered under BPT. The Agency indicated that it had not identified technologies that achieve greater removals of conventional pollutants other that those associated with the proposed BPT limits. EPA has not received any comments concerning its proposed BCT technology basis. Because EPA did not identify any incremental conventional pollutant removal technology options that pass the BCT cost reasonableness test, EPA is promulgating BCT limitations equal to the BPT limitations for conventional pollutants covered under BPT.

As explained above, EPA based the proposed pretreatment standard on two stages of chemical precipitation, with no sand filtration as the final step. EPA received comments that it should include the additional filtration step used in calculating its BPT/BCT/BAT standards for the proposal to calculate PSES standards, and adopt pretreatment standards based on the same level of treatment as its BPT/BAT standards. EPA also received comments that it should promulgate PSES standards as proposed.

Based on new data received and analyzed by EPA following proposal of the IWC rule, EPA has decided to base PSES and BPT/BCT/BAT on the same treatment technology. The standards based on this technology allow a facility to either use or not use sand filtration as the last treatment step, depending on what is necessary to meet the pretreatment standards. EPA costed the PSES technology standards with sand filtration to ensure its economic achievability.

Section 307(b) of the Act requires EPA to promulgate pretreatment standards for pollutants that are not susceptible to treatment by POTWs or which would interfere with the operation of POTWs. EPA looks at a number of factors in deciding whether a pollutant was not susceptible to treatment at a POTW or would interfere with POTW operations—the predicate to establishment of pretreatment standards. First, EPA assesses the pollutant removals achieved at POTWs relative to those achieved by directly discharging systems using BAT treatment. Second, EPA estimates the quantity of pollutants likely to be discharged to receiving waters after POTW removals. Third, EPA studies whether any of the pollutants introduced to POTWs by combustors interfered with or are otherwise incompatible with POTW operations.

EPA is establishing PSES for this industry to prevent pass-through of the same pollutants controlled by BPT/BCT/BAT from POTWs to waters of the U.S. EPA has determined that all of the pollutants that ''passed through'' at proposal would ''pass through'' and has consequently developed pretreatment standards for these pollutants. Today's pretreatment standards represent a national baseline for CHWCs. Local authorities are free to establish stricter limitations (based on site-specific water quality concerns) if they deem it necessary.

For this rule, EPA has looked at the combined economic impacts of the final

regulatory option for both direct and indirect dischargers. EPA has combined these because it concluded, that in the case of CHWCs, there are no economic differences between direct and indirect dischargers that would support separate evaluation of the economic achievability of the selected technology. Both direct and indirect dischargers face the same capital requirement for treatment technology upgrades. Furthermore, the costs of the selected treatment technology are essentially the same for both direct and indirect dischargers because the technology is designed to remove metal pollutants not susceptible to POTW treatment. There are not additional biological controls for direct dischargers because the thermal operations are expected to destroy any organic pollutants in the incinerated wastes so that only traces remain in the scrubber water. In these circumstances, both direct and indirect dischargers also share similar profiles with respect to the characteristics of wastewater generated. In order to determine the cost of compliance with the BPT/BCT/BAT/PSES limitations and standards, EPA included the cost of installation of sand filtration at all CHWC facilities as a conservative approach because, as explained above, not all facilities will require one to meet the limitations and standards. EPA concluded the cost of installation of the selected control technology is economically achievable. See discussion of economic impacts in Section V below.

C. New Source Performance Standards (NSPS)

EPA proposed to establish NSPS equal to BPT/BCT/BAT for all conventional, non-conventional and priority pollutants covered under BPT. EPA has decided that it should not promulgate NSPS based on any more stringent technology. EPA considered basing NSPS on zero discharge but has rejected this technology. As explained above, EPA has concluded that zero discharge may not ultimately result in any reduction in effluent discharges relative to BPT/BCT/BAT levels or it may have unacceptable non-water quality effects.

EPA received a comment stating that EPA's discussion of recycling scrubber water as a potential component of NSPS was insufficient. The commenter explained that it understood why EPA might be hesitant in recommending such a system as a basis for BAT, but argued that incorporating a system to recycle scrubber water would pose a lesser financial burden on new sources. EPA agrees that such a system would pose a lesser financial burden on new sources, but does not agree that it should require all new sources to be zero dischargers as explained previously. EPA bases its decision on the fact that the HWC final MACT rule standards for new incinerators permit use of both wet and dry scrubbing systems. EPA bases the emission standards for dioxins and furans, for example, on an activated carbon injection system used at Waste Treatment Industries (WTI) Incinerator in Liverpool, Ohio. However, EPA bases the emission standards for mercury on wet scrubbing and hazardous waste feedrate control of mercury. EPA concluded that it could not establish that all systems using wet scrubbers, as allowed under the HWC final MACT rule, could recycle all of their scrubber water discharges.

EPA is promulgating NSPS that would control the same conventional, priority, and non-conventional pollutants as the BPT effluent limitations. The technologies used to control pollutants at existing facilities are fully applicable to new facilities. Therefore, EPA is promulgating NSPS limitations that are identical to BPT/BCT/BAT/PSES.

EPA considered the cost of the NSPS technology for new facilities. EPA concluded that such costs are not so great as to present a barrier to entry, as demonstrated by the fact that currently operating facilities are using these technologies. The Agency considered energy requirements and other non-water quality environmental impacts and found no basis for any different standards than the selected NSPS.

D. Pretreatment Standards for New Sources (PSNS)

EPA proposed PSNS for nine priority and non-conventional metal pollutants. EPA based the proposed standards on two stages of chemical precipitation, with no sand filtration as the final step. The proposed pretreatment standards for new sources were identical to the proposed PSES. EPA received comments that it should adopt PSNS based on two stages of chemical precipitation followed by sand filtration, given the increased removals that would be achieved by the addition of sand filtration. The final PSNS essentially does this. EPA has decided to base PSNS on the same technology as it used for BPT/BCT/BAT/PSES—chromium reduction (as necessary) and two-stage precipitation with or without sand filtration. EPA concluded that sand filtration was not necessary in all cases to achieve BAT metals removals. The data showed that the facilities with and without filtration were achieving high, BAT removals. Filtration may be used as a polishing step depending on the level of treatment provided in the initial two stages of precipitation. The final BAT limitations and PSES were based on data from facilities with and without filtration.

The Agency is establishing PSNS for the same priority and non-conventional pollutants as for PSES.

EPA considered the cost of the PSNS technology for new facilities. EPA concluded that such costs are not so great as to present a barrier to entry, as demonstrated by the fact that currently operating facilities are using these technologies. The Agency considered energy requirements and other non-water quality environmental impacts and found no basis for any different standards than the selected PSNS.

V. Costs and Impacts for the Final Commercial Hazardous Waste Combustor Regulations

A. Contents of Economic Analysis

The economic analysis for the final Commercial Hazardous Waste Combustor effluent limitations guidelines and pretreatment standards assesses the costs and impacts of these guidelines. The record for the final rule contains results of this analysis. The ''Economic Analysis of Final Effluent Limitations Guidelines and Standards for Commercial Hazardous Waste Combustors'' (EPA 821–B–99–008) (hereafter ''EA'') summarizes these results. This document looks at (1) the annualized cost of the rule (2) the impacts of the rule on Commercial Hazardous Waste Combustor facilities and firms (3) the impacts of the rule on employment and communities; and, (4) other secondary impacts on trade, inflation, POTWs, environmental justice, and distributional equity. The preamble to the proposal also discusses EPA's approach to costing this rule (63 FR 6407). EPA has used the same methodology for estimating the cost of compliance with the final rule as it used for the proposal except for the RCRA permit costing issue discussed under Section III.H above.

B. Summary of Results

1. Overview of Methodology

The EA evaluates the economic effect on the industry of compliance with the regulation by two measures of impact: facility closures (severe impacts) and adverse financial effects short of closure (moderate impacts). For this rule, EPA has looked at the combined economic impacts of the final regulatory option for both direct and indirect dischargers. EPA has combined these because there are no differences between direct and

indirect discharges with respect to the characteristics of wastewater generated or the model process technologies considered to develop the final limitations and standards, as well as to prevent the disclosure of confidential business information. The report also includes an analysis of the effects of the regulation on new Commercial Hazardous Waste Combustor facilities and impacts on small businesses and other small entities. EPA made no substantive changes to the economic impact methodology since proposal. The preamble to the proposed rule summarizes the methodology (63 FR at 6409). Chapter 4 of the EA contains a complete description of the methodology.

2. Summary of Costs

Table V.C–1 shows the total costs for the final limitations and standards. EPA estimates the final rule will have a total post-tax annualized cost of $2.01 million.

TABLE V.C–1 TOTAL COSTS OF FINAL LIMITATIONS AND STANDARDS

Final limitations and standards	Total capital costs (million 1998$)	Total O&M costs (million 1998$)	Total post-tax annualized costs (million 1998$)
BPT/BAT/PSES	8.19	1.97	2.01

3. Summary of Economic Impacts for Existing Dischargers

EPA evaluates the impacts associated with compliance costs for all the facilities affected by the regulation. EPA projects one facility will discontinue its waste burning operations. The facility as a whole, however, will continue to operate. The waste burning operations at this facility represent significantly less than 10 percent of total facility revenue. EPA estimates that the cessation of waste burning operations will cause 27 job losses on a full-time equivalent basis (FTE). EPA estimates that no other facilities will experience either severe or moderate impacts.

4. Cost Reasonableness of Final BPT Option

EPA evaluated the cost of the BPT option in relation to effluent reduction benefits by first calculating pre-tax total annualized costs and total pollutant removals in pounds. EPA then compared the ratio of costs to removals for the option to the range of ratios in previous regulations to gauge its impact. EPA calculates that BPT costs $27 per pound of TSS and metal pollutants removed. EPA found this cost to reduction comparison to be reasonable.

5. Economic Impacts of New Sources

EPA is establishing NSPS and PSNS equivalent to the limitations that are established for BPT/BCT/BAT and PSES. In general, EPA concluded that new sources will be able to comply at costs that are similar to or less than the costs for existing sources, because new sources can apply control technologies more efficiently than sources that need to retrofit for those technologies. As a result, given EPA's finding of economic achievability for BPT/BCT/BAT and PSES , EPA also finds that the NSPS and PSNS will be economically achievable and will not constitute a barrier to entry for new sources.

6. Firm-Level Impacts

A firm is a business entity or company and may be composed of a number of facilities. The firm level analysis evaluates the effects of regulatory compliance on firms owning one or more affected CHWC facilities. It also serves to identify impacts not captured in the facility level analysis. For example, some companies might be too weak financially to undertake the investment in the required effluent treatment, even though the investment might seem financially feasible at the facility level. Companies owning more than one facility subject to regulation may experience this effect.

The firm-level analysis assesses the impacts of compliance costs at all facilities owned by the firm. EPA uses ratio analysis for this assessment. This analysis employs two indicators of financial viability: the rate of return on assets (ROA) and the interest coverage ratio (ICR). ROA is a measure of the profitability of a company's capital assets. It is computed as the earnings before interest and taxes minus taxes divided by total assets. ICR is a measure of the financial leverage of a company. It is computed as the earnings before interest and taxes divided by interest expense.

Two firms each own three CHWC facilities that would be subject to the guidelines. EPA evaluated the effect on the firms as described above. First, EPA calculated the baseline ROA and ICR for each company absent the final regulation. Then EPA calculated the ratios after the projected investment in wastewater treatment equipment and the associated compliance costs. One firm experiences no measurable effect as the result of compliance with the final regulation. In its case, neither the ROA nor the ICR changes between the baseline and postcompliance analysis. The second firm experiences an insignificant decline in ROA and a minor decline in ICR. The decline in ICR, while significant in percentage terms, is an artifact of the firm's extremely low level of debt. As a result, EPA concluded that the guidelines will not significantly affect the two firms.

7. Community Impacts

EPA assesses community impacts by estimating the expected change in employment in communities with CHWCs subject to the guidelines. Possible community employment effects include the employment losses in the facilities that are expected to close because of the regulation and the related employment losses in other businesses in the affected community. In addition to these estimated employment losses, employment may increase as a result of facilities' operation of treatment systems for regulatory compliance. It should be noted that job gains will mitigate community employment losses only if they occur in the same communities in which facility closures occur.

EPA estimates the final regulation will result in the postcompliance closure of the waste burning operations of one facility. The postcompliance closure results in the direct loss of 27 Full-Time Equivalent (FTE) positions. EPA estimates secondary employment effects based on multipliers that relate the change in employment in a directly affected industry to aggregate employment effects in linked industries and consumer businesses whose employment is affected by changes in the earnings and expenditures of the employees in the directly and indirectly affected industries. The application of the national average multiplier of 4.049 to the 27 direct FTE losses leads to an estimated community impact of 110

total FTE losses as the result of the final rule. The county in which EPA projects one closure has a current employment of approximately 170,000 FTEs dispersed among 9,900 establishments. The direct and secondary job losses represent 0.06 percent of current employment in the affected county.

Job gains associated with the operation of control equipment mitigate the FTE losses. EPA estimates the gains at 10 FTEs nationally. EPA estimates the secondary and indirect effects at the national level by using the average multiplier of 4.049. This results in an estimate of 40 total FTE gains associated with the pollution control equipment. EPA concludes the projected impacts are small and do not change EPA's finding of economic achievability.

8. Foreign Trade Impacts

The EA does not project any foreign trade impacts as a result of the effluent limitations guidelines and standards. Because most of the affected CHWC facilities treat waste that is considered hazardous under RCRA, international trade in CHWC services for treatment of hazardous wastes is virtually nonexistent.

VI. Water Quality Analysis and Other Environmental Benefits

A. Characterization of Pollutants

EPA evaluated the environmental benefits of controlling the discharges to surface waters and POTWs from CHWCs of the 9 priority and nonconventional pollutants regulated by today's rule as well as the incidental removals of 6 other priority and nonconventional pollutants (aluminum, antimony, iron, molybdenum, selenium and tin). Discharges of these pollutants into freshwater and estuarine ecosystems may alter aquatic habitats, adversely affect aquatic biota, and adversely impact human health through the consumption of contaminated fish and drinking water. Furthermore, these pollutants may also interfere with POTW operations by inhibiting activated sludge or biological treatment or by contaminating sewage sludges, thereby limiting how it may be disposed and thereby raising its costs.

All of these pollutants have at least one identified toxic effect (human health carcinogen and/or systemic toxicant or aquatic toxicant). EPA reviewed additional information on toxicity since the proposal, and updated the toxicity values for nine of the 15 pollutants modeled in the water quality analysis. Toxicity values for three pollutants increased, while toxicity values for six pollutants decreased. In addition, many of these pollutants bioaccumulate in aquatic organisms and persist in the environment.

The Agency did not evaluate the effects of the discharges of any conventional pollutant because its analysis focused on priority and nonconventional pollutants. However, the discharge of a conventional pollutant such as total suspended solids (TSS) can have adverse effects on human health and the environment. For example, habitat degradation can result from increased suspended particulate matter that reduces light penetration, and thus primary productivity, or from accumulation of sludge particles that alter benthic spawning grounds and feeding habitats.

B. Facilities Modeled

EPA evaluated the potential effect on aquatic life and human health of wastewater discharges to receiving waters at current levels of treatment and at levels achieved by BPT/BAT/PSES treatment for direct and indirect discharges. EPA predicted steady-state instream pollutant concentrations assuming immediate mixing with no loss from the system, and compared these levels to EPA-published water quality criteria guidance or to documented toxic effect levels (i.e., lowest reported or estimated toxic concentration) for those chemicals for which EPA has not published water quality criteria. (In performing this analysis, EPA used its published guidance documents that recommend numeric human health and aquatic life water quality criteria for numerous pollutants. States often consult these guidance documents when adopting water quality criteria as part of their water quality standards. However, because those State-adopted criteria may vary, EPA used the nationwide criteria guidance as the most representative value.)

In addition, EPA assessed the potential benefits to human health by estimating the risks (carcinogenic and systemic effects) associated with reducing pollutant levels in fish tissue and drinking water from current to BPT/BAT treatment levels for direct dischargers, and from current to pretreatment levels for indirect dischargers. EPA estimated risks for recreational and subsistence anglers and their families, as well as the general population.

EPA performed these analyses for the eight CHWC facilities currently in operation. Achievement of BPT/BAT and pretreatment standards will reduce current pollutant loadings (in pounds) of the 15 priority and nonconventional pollutants modeled by 88 percent.

EPA projected instream concentrations for five pollutants will exceed acute or chronic aquatic life criteria or toxic effect levels in three of the eight receiving streams. Compliance with the guidelines will eliminate excursions of the acute criteria by two pollutants and the excursions of chronic criteria by one pollutant.

Current instream concentrations exceed human health criteria or toxic effect levels in five of the receiving streams. Compliance with the guidelines eliminates excursions in one stream completely and reduces the remaining excursions to a limited extent by eliminating the excursions of one pollutant. Estimates of the increase in value of recreational fishing to anglers as a result of this improvement range from $93,300 to $334,000 annually (1998 dollars). In addition, the estimate of the nonuse (intrinsic) benefits to the general public, as a result of the same improvements in water quality, ranges from $46,700 to $167,000 (1998 dollars).

Compliance with the guidelines will reduce total excess annual cancer cases by an estimated 6.6E–3 excess cases. The monetary value of benefits to society from these avoided cancer cases is $17,700 to $92,700 (1998 dollars). (EPA did not assign a monetary value to this benefit at proposal.) EPA does not project systemic toxicant effects (non-carcinogenic adverse human health effects including reproductive toxicity) for any of the receiving streams at current discharge levels.

C. POTWs

EPA also evaluated the potential adverse impacts from CHWC discharges on POTW operations (inhibition of microbial activity during biological treatment) and contamination of sewage sludge at the POTW. The Agency estimates inhibition by comparing predicted POTW influent concentrations to available inhibition levels. For this evaluation, EPA used the inhibition values in an EPA document, *Guidance Manual for Preventing Interference at POTWs* (U.S. EPA, 1987) and *CERCLA Site Discharges to POTWs: Guidance Manual* (U.S. EPA, 1990). EPA estimated potential contamination of sewage sludge by comparing projected pollutant concentrations in POTW sewage sludge to available EPA criteria. EPA has established CWA standards for sewage sludge use and disposal at 40 CFR part 503. These regulations limit the concentrations of pollutants in sewage sludge that is used or disposed. For the purpose of this analysis, EPA considered the sewage

sludge contaminated if the concentration of a pollutant in sewage sludge exceeds the limits presented in 40 CFR part 503 for land application of the sludge or surface disposal.

EPA evaluated 10 pollutants for potential POTW operation inhibition and seven pollutants for potential sewage sludge contamination. At current discharge levels, EPA projects no inhibition problems at POTWs receiving wastewater but does project sewage sludge contamination. EPA projects that compliance with the pretreatment standards will eliminate contamination problems. EPA estimates that POTWs will accrue a modest benefit through reduced recordkeeping requirements and exemption from certain sewage sludge management practices. EPA did not assign a monetary value to this improvement in sewage sludge quality.

The POTW inhibition values used in this analysis are not, in general, regulatory values. EPA based these values upon engineering and health estimates contained in guidance or guidelines published by EPA and other sources. Therefore, EPA has not based these pretreatment standards on the fact that some pollutants may impair POTW treatment effectiveness. Of course, as explained above, EPA did find that certain pollutants would pass through as a basis for establishing pretreatment standards. Still, the values used in this analysis help indicate the potential benefits for POTW operations that may result from the compliance with pretreatment discharge levels.

VII. Non-Water Quality Environmental Impacts

The elimination or reduction of one form of pollution may create or aggravate other environmental problems. Therefore, sections 304(b) and 306 of the Act call for EPA to consider non-water quality environmental impacts of effluent limitations guidelines and standards. Accordingly, EPA has considered the effect of these regulations on air pollution, waste treatment residual generation, and energy consumption.

A. Air Pollution

Commercial Hazardous Waste Combustor facilities treat wastewater streams which contain very low concentrations of volatile organic compounds (VOCs). Typically, concentrations of VOCs are below treatable levels in CHWC wastewater streams.

Because there are only low concentrations of VOCs in CHWC wastewater, EPA estimates that there will be no significant air emissions associated with treatment systems installed to comply with the guidelines. Thus, EPA does not expect adverse air quality impacts due to the final regulations.

B. Waste Treatment Residuals

Use of metals precipitation and sand filtration to comply with the guidelines will generate waste treatment residuals. EPA assessed the cost of off-site disposal in subtitles C and D landfills for these residuals. These costs were included in the economic evaluation of the technologies.

EPA estimates that the 8 facilities will generate an additional 1 million pounds of sludge per year from metals precipitation and sand filtration operations. The disposal of this filter cake will not have an adverse effect on the environment or result in the release of pollutants in the filter cake to other media. The reason EPA has concluded this will be true is that the disposal of these wastes into controlled subtitles C or D landfills are strictly regulated by the RCRA program.

C. Energy Requirements

EPA estimates that the attainment of BPT, BCT, BAT, NSPS, PSES, and PSNS will increase energy consumption by a small increment over present industry use. Overall, compliance with the guidelines will result in an increase of 1,672 thousand kilowatt hours per year, which equates to 937 barrels of oil per year. The United States consumed 19 million barrels of oil per day in 1994.

VIII. Regulatory Implementation

The purpose of this section is to provide assistance and direction to permit writers and control authorities to aid in their implementation of this regulation. This section also discusses the relationship of upset and bypass provisions, variances and modifications, and analytical methods to the final limitations and standards.

A. Implementation of the Limitations and Standards

As previously explained, new and reissued Federal and State NPDES permits to direct dischargers must include the effluent limitations promulgated today. Existing indirect dischargers must comply with today's pretreatment standards no later than January 27, 2003. New direct and indirect discharging sources must comply with applicable limitations and standards on the date the new sources begin operations.

Permit writers and pretreatment authorities should also closely explore special circumstances which might merit BPJ limitations similar to the limitations promulgated here. If an intracompany incinerator burns waste from off site from a facility under the same corporate structure and operations generating the off-site waste is neither subject to the same provisions in 40 CFR subchapter N nor is the waste of a similar nature to the wastes being burned from industrial processes on site, it would not be a CHWC. However, permit writers and pretreatment authorities should consider whether limitations similar to the guidelines should apply to this intracompany facility. Also, if a facility burns dissimilar wastes for no fee or other remuneration, it would not be a CHWC. In this case, permit writers and pretreatment authorities should also consider whether limitations similar to the guidelines should apply to this facility.

As explained above, EPA has decided that these guidelines do not apply to cement kilns for the reasons discussed above at section III.D. However, there may be circumstances where permit writers should consider whether they will need to establish BPJ limitations or local control authorities may need to establish local limits to control discharges of toxic pollutants in the scrubber water. Permit writers should compare cement kiln scrubber wastewater with the information provided in the TDD concerning the characteristics of CHWC wastewater to determine whether similar discharge limitations should be established.

B. Upset and Bypass Provisions

A ''bypass'' is an intentional diversion of waste streams from any portion of a treatment facility. An ''upset'' is an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. EPA's regulations concerning bypasses and upsets are set forth at 40 CFR 122.41(m) and (n) and 40 CFR 403.16 and 403.17.

C. Variances and Modifications

Upon the promulgation of these regulations, all new and reissued Federal and State NPDES permits issued to direct dischargers in the CHWC Industry must include the effluent limitations. In addition, the indirect dischargers must comply with the pretreatment standards within 3 years of issuance.

1. Fundamentally Different Factors Variances

The CWA requires application of the effluent limitations established pursuant to section 301 or the pretreatment standards of section 307 to all direct and indirect dischargers. However, the statute provides for the modification of these national requirements in a limited number of circumstances. Moreover, the Agency has established administrative mechanisms to provide an opportunity for relief from the application of national effluent limitations guidelines and pretreatment standards for categories of existing sources for priority, conventional and non-conventional pollutants.

EPA will develop effluent limitations or standards different from the otherwise applicable requirements if an individual existing discharging facility is fundamentally different with respect to factors considered in establishing the limitations or standards applicable to the individual facility. Such a modification is known as a ''fundamentally different factors'' (FDF) variance.

Early on, EPA, by regulation, provided for FDF modifications from BPT effluent limitations, BAT limitations for priority and non-conventional pollutants and BCT limitation for conventional pollutants for direct dischargers. For indirect dischargers, EPA provided for FDF modifications from pretreatment standards for existing facilities. FDF variances for priority pollutants were challenged judicially and ultimately sustained by the Supreme Court (*Chemical Manufacturers Ass'n* v. *NRDC,* 479 U.S. 116 (1985)).

Subsequently, in the Water Quality Act of 1987, Congress added new section 301(n) of the Act explicitly to authorize modification of the otherwise applicable BAT effluent limitations or categorical pretreatment standards for existing sources if a facility is fundamentally different with respect to the factors specified in section 304 (other than costs) from those considered by EPA in establishing the effluent limitations or pretreatment standard. Section 301(n) also defined the conditions under which EPA may establish alternative requirements. Under section 301(n), an application for approval of FDF variance must be based solely on (1) information submitted during the rulemaking raising the factors that are fundamentally different or (2) information the applicant did not have an opportunity to submit. The alternate limitation or standard must be no less stringent than justified by the difference and not result in markedly more adverse non-water quality environmental impacts than the national limitation or standard.

EPA regulations at 40 CFR part 125, subpart D, authorizing the Regional Administrators to establish alternative limitations and standards, further detail the substantive criteria used to evaluate FDF variance requests for existing direct dischargers. Thus, 40 CFR 125.31(d) identifies six factors (e.g., volume of process wastewater, age and size of a discharger's facility) that may be considered in determining if a facility is fundamentally different. The Agency must determine whether, on the basis of one or more of these factors, the facility in question is fundamentally different from the facilities and factors considered by the EPA in developing the nationally applicable effluent guidelines. The regulation also lists four factors (e.g., infeasibility of installation within the time allowed or a discharger's ability to pay) that may not provide a basis for an FDF variance. In addition, under 40 CFR 125.31(b)(3), a request for limitations less stringent than the national limitation may be approved only if compliance with the national limitations would result in either (a) a removal cost wholly out of proportion to the removal cost considered during development of the national limitations, or (b) a non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the national limits. EPA regulations provide for an FDF variance for existing indirect discharger at 40 CFR 403.13. The conditions for approval of a request to modify applicable pretreatment standards and factors considered are the same as those for direct dischargers.

The legislative history of section 301(n) underscores the necessity for the FDF variance applicant to establish eligibility for the variance. EPA's regulations at 40 CFR 125.32(b)(1) are explicit in imposing this burden upon the applicant. The applicant must show that the factors relating to the discharge controlled by the applicant's permit which are claimed to be fundamentally different are, in fact, fundamentally different from those factors considered by the EPA in establishing the applicable guidelines. The pretreatment regulation incorporate a similar requirement at 40 CFR 403.13(h)(9).

An FDF variance is not available to a new source subject to NSPS or PSNS.

2. Water Quality Variances

Section 301(g) of the CWA authorizes a variance from BAT effluent guidelines for certain nonconventional pollutants due to localized environmental factors. These pollutants include ammonia, chlorine, color, iron, and total phenols.

3. Permit Modifications

Even after EPA (or an authorized State) has issued a final permit to a direct discharger, the permit may still be modified under certain conditions. (When a permit modification is under consideration, however, all other permit conditions remain in effect.) A permit modification may be triggered in several circumstances. These could include a regulatory inspection or information submitted by the permittee that reveals the need for modification. Any interested person may request that a permit modification be made. There are two classifications of modifications: major and minor. From a procedural standpoint, they differ primarily with respect to the public notice requirements. Major modifications require public notice while minor modifications do not. Virtually any modifications that results in less stringent conditions is treated as a major modification, with provisions for public notice and comment. Conditions that would necessitate a major modification of a permit are described in 40 CFR 122.62. Minor modifications are generally non-substantive changes. The conditions for minor modification are described in 40 CFR 122.63.

4. Relationship of Effluent Limitations to NPDES Permits and Monitoring Requirements

Effluent limitations act as a primary mechanism to control the discharges of pollutants to waters of the United States. These limitations are applied to individual facilities through NPDES permits issued by the EPA or authorized States under section 402 of the Act.

The Agency has developed the limitations and standards for today's rule to cover the discharge of pollutants for this industrial subcategory. In specific cases, the NPDES permitting authority may elect to establish technology-based permit limits for pollutants not covered by this regulation. In addition, if State water quality standards or other provisions of State or Federal Law require limits on pollutants not covered by this regulation (or require more stringent limits on covered pollutants), the permitting authority must apply those limitations.

For determination of effluent limits where there are multiple categories and subcategories, the effluent guidelines are applied using a flow-weighted combination of the appropriate guideline for each category or

subcategory. Where a facility treats an Commercial Hazardous Waste Combustor waste stream and process wastewater from other industrial operations, the effluent guidelines would be applied by using a flow-weighted combination of the BPT/BAT limitations for the Commercial Hazardous Waste Combustor and the other industrial operations to derive the appropriate limitations. However, as stated above, if State water quality standards or other provisions of State or Federal Law require limits on pollutants not covered by this regulation (or require more stringent limits on covered pollutants), the permitting authority must apply those limitations regardless of the limitations derived using the flow-weighted combinations.

Working in conjunction with the effluent limitations are the monitoring conditions set out in a NPDES permit. An integral part of the monitoring conditions is the point at which a facility must monitor to demonstrate compliance. The point at which a sample is collected can have a dramatic effect on the monitoring results for that facility. Therefore, it may be necessary to require internal monitoring points in order to assure compliance. Authority to address internal waste streams is provided in 40 CFR 122.44(i)(1)(iii) and 122.45(h). Permit writers may establish additional internal monitoring points to the extent consistent with EPA's regulations.

D. Analytical Methods

Section 304(h) of the Act directs EPA to promulgate guidelines establishing test methods for the analysis of pollutants. EPA uses these methods to determine the presence and concentration of pollutants in wastewater. NPDES permitting authorities use these methods for compliance monitoring and for filing applications for the NPDES program under 40 CFR 122.21, 122.41, 122.44 and 123.25. Pretreatment control authorities also use these for the implementation of the pretreatment standards under 40 CFR 403.10 and 403.12. To date, EPA has promulgated methods for conventional pollutants, toxic pollutants, and for some nonconventional pollutants. EPA's CWA regulations list five conventional pollutants at 40 CFR 401.16. Table I–B at 40 CFR Part 136 lists the analytical methods approved for the conventional pollutants. EPA's CWA regulations list 65 toxic metals and organic pollutants and classes of pollutants at 40 CFR 401.15. From the list of 65 classes of toxic pollutants EPA identified a list of 126 ''Priority Pollutants,'' shown, for example, at 40 CFR part 423, appendix A. The list includes non-pesticide organic pollutants, metal pollutants, cyanide, asbestos, and pesticide pollutants. The table of approved inorganic test procedures at 40 CFR 136.3, Table I–B includes the currently approved methods for metals. Discharger permits must include the test methods promulgated at 40 CFR 136.3 or incorporated by reference in the tables, when available, to monitor pollutant discharges from commercial hazardous waste combustors for the pollutants specified in today's effluent limitations guidelines.

As a part of today's final rule, EPA is promulgating an additional test method for some of the metal pollutants to be regulated under part 444. This test method is EPA Method 200.8, ''Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry.'' EPA first proposed this analytical method with others in 1995 (60 FR 53988, October 18, 1995). EPA plans to promulgate the other proposed methods in the near future. In the meantime, EPA has decided to promulgate EPA Method 200.8 in today's rulemaking because EPA used this test method to analyze samples during development of this rule. EPA included testing results using this method in the administrative record at the time of proposal. EPA also has incorporated this method into the approved methods for its Safe Drinking Water Act national primary drinking water regulations at 40 CFR 141.23.

In addition, EPA is allowing use of an applicable Inductively Coupled Plasma-Mass Spectrometry method from the Annual Book of ASTM Standards, ASTM D 5673–96, for monitoring of the regulated pollutants. The final rule allows for use of these two additional test methods for several reasons: First, it allows greater flexibility in monitoring; Second, it conforms use of methods in EPA's drinking water and wastewater programs; Third, it moves toward a performance-based measurement system; Finally, it allows use of technical standards as contemplated by the National Technology Transfer and Advancement Act of 1995 (NTTAA; see Section IX). EPA is promulgating these methods today using direct final rulemaking.

With the allowed use of the test methods included above, in addition to those already approved in Table IIB at 40 CFR 136.3 and incorporated by reference into this regulation, EPA will provide dischargers with greater flexibility in selection of a method for monitoring the pollutants being regulated in today's final rule.

IX. Regulatory Requirements

A. Executive Order 12866

Under Executive Order 12866 (58 FR 51735 (October 4, 1993)), the Agency must determine whether the regulatory action is ''significant'' and therefore subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order. The Order defines ''significant regulatory action'' as one that is likely to result in a rule that may:

(1) have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

It has been determined that this rule is a not a ''significant regulatory action'' under the terms of Executive Order 12866 and is therefore not subject to OMB review.

B. Regulatory Flexibility Act (RFA), as Amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 USC 601 et seq.

The RFA generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions. For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) a small business that has annual revenues less than $6 million (i.e., the definition for SIC 4953, Refuse Systems); (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule, I certify that this action will not have a significant economic impact on a substantial number of small entities. This final rule will not impose any requirements on small entities. Today's final rule establishes requirements applicable only to Commercial Hazardous Waste Combustors. The facilities subject to this rule are all owned by large entities with firm revenues in excess of $230 million each per year. Consequently, there are no small businesses affected by the rule.

C. Submission to Congress and the General Accounting Office

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective February 28, 2000.

D. Paperwork Reduction Act

This rule contains no information collection requirements. Therefore, it is not subject to the Paperwork Reduction Act of 1995.

E. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

EPA has determined that this rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. EPA has estimated total annualized costs of the final rule as $2.01 million (1998$, post-tax). Thus, today's rule is not subject to the requirements of sections 202 and 205 of the UMRA.

EPA has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. EPA projected no incremental requirements for small governments. Thus, today's rule is not subject to the requirements of section 203 of the UMRA.

F. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

Under Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the proposed regulation. EPA also may not issue a regulation that has federalism implications and that preempts State law unless the Agency consults with State and local officials early in the process of developing the proposed regulation.

This final rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. The rule will not impose substantial costs on States and localities. The rule establishes effluent limitations and pretreatment standards imposing requirements that apply to CHWCs when they discharge wastewater or introduce wastewater to a POTW. The rule does not apply directly to States and localities and will only affect State and local governments when they are administering CWA permitting programs. The final rule, at most, imposes minimal administrative costs on States and local governments if the States have an authorized NPDES programs and local governments administering approved pretreatment programs. (These States and localities must incorporate the new limitations and standards in new and reissued NPDES permits or local pretreatment orders or permits). Thus, the requirements of section 6 of the Executive Order do not apply to this rule.

G. Executive Order 13084: Consultation and Coordination With Indian Tribal Governments

Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian Tribal governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the tribal governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide to the Office of Management and Budget, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected tribal governments, a summary of the nature of their concerns,

and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian tribal governments ''to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.''

Today's Rule does not significantly or uniquely affect the communities of Indian tribal governments. EPA has not identified any facilities covered by today's rule that are owned and operated by Indian tribal governments. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this rule.

H. National Technology Transfer and Advancement Act

As noted in the proposed rule, section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Pub. L. 104–113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, business practices) that are developed or adopted by voluntary consensus standard bodies. The NTTAA directs EPA to provide Congress, through the Office of Management and Budget (OMB), explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This rule involves technical standards. Therefore, the Agency conducted a search to identify potentially applicable test methods from voluntary consensus standard bodies. EPA's search revealed that there is one new consensus standard for some metals included in today's rule. Even prior to enactment of the NTTAA, EPA has traditionally included any applicable test methods in its regulations. EPA promulgates this voluntary consensus standard (ASTM Method D 5673–96) as part of this rulemaking. Today's rule also promulgates a number of voluntary consensus standards for the regulated pollutants. These standards were previously promulgated at 40 CFR part 136.

I. Executive Order 13045 and Protecting Children's Health

The Executive Order ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children; and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency. This rule is not subject to E.O. 13045 because it is not ''economically significant'' as defined under Executive Order 12866.

X. Summary of Public Participation

The following sections describe the major comments on the proposed rule and the NOA, and EPA's responses. The public record contains the full comment summary and response document for this rulemaking.

A. Summary of Proposal Comments and Responses

Thirty-nine commenters provided detailed comments on the February 6, 1998 proposal. In all, the comments dealt with 51 separate aspects of the proposal. This summary addresses only the major comments.

Comment: Several commenters asked EPA to redefine ''IWC facility'' so that a waste combustor burning off-site wastes without charge would not automatically fall within the scope of the rule. The commenters suggested adopting the definition of intracompany waste combustors found in the 1992 survey of the IWC industry.

Response: EPA has decided to limit the applicability of the guidelines to certain commercial hazardous waste combustors. The revised scope of the rule for CHWCs (formerly IWCs) will alleviate the concerns expressed and will allow a facility to burn wastes if received for no fee or other remuneration without subjecting the associated wastewaters to the CHWC guidelines.

Comment: The commenter supports the inclusion of a de minimis exclusion for wastes associated with product stewardship, public service, and sub-contractor activities off-site.

Response: Under the revised definition, a facility would not be a CHWC merely because it accepted product stewardship wastes if these wastes are either of a similar nature or are subject to the same provisions in 40 CFR Subchapter N as the operations generating the wastes being burned from industrial processes on-site. Further, for example, a facility would not be a CHWC if it burns household hazardous wastes for the community. Household hazardous wastes are exempt from RCRA hazardous waste regulations. CHWC facilities, however, that burn dissimilar RCRA hazardous wastes will be covered by the final CHWC rule.

EPA has no information on which to establish a de minimis level for dissimilar wastes burned from off-site for a fee or other remuneration. EPA believes that the majority of waste burned as product stewardship activity and waste received from subcontractor activities from off-site will be exempt from the CHWC rule due to its similar nature. EPA also believes that public service activities will generally be exempt because the waste received is either not hazardous under RCRA or exempt from RCRA hazardous waste regulations (e.g., exempt household hazardous waste, non-hazardous waste from public agencies, and wastes from small quantity generators).

Comment: One commenter suggests that the HWC maximum achievable control technology (MACT) rule will cause higher loadings in the scrubber water than there currently are.

Response: EPA promulgated the MACT rule for hazardous waste combustors (HWC) this summer at (64 FR 52828, July 30, 1999).

Using detailed emissions data collected under the HWC MACT rule, EPA estimates that, overall, there is a possibility of a 100 percent increase in particulate matter loadings at a CHWC facility. EPA used this estimate to determine the potential effect the MACT standards would have on CHWC facilities. (The commenter submitted no data that would allow EPA to determine how much its own loadings will change.) Specifically, EPA has performed an economic sensitivity analysis to estimate the effects on costs of a 100 percent increase in loadings in the scrubber water for CHWC facilities. EPA compared BPT/BAT baseline costs to costs for an increase of 100 percent in concentration for metals and total suspended solids. For direct discharge facilities, the total annualized compliance costs ($1992) would increase 3 percent and for indirect discharge facilities, the total annualized compliance costs would increase 13 percent. However, no facilities would experience severe impacts (closure) or moderate impacts (compliance costs greater than 5 percent of revenue) as a result of the increased compliance costs. Thus, the sensitivity analysis indicates that a potential increase in loadings of 100 percent would not affect the

economic achievability determination for the selected technology option.

Comment: EPA should not regulate high temperature metals recovery facilities under the IWC guideline if they are exempt from regulation under 40 CFR 266.100(c) as a RCRA BIF.

Response: The guidelines do not apply to facilities (like high temperature metals recovery facilities) that are not subject either to 40 CFR part 264, subpart O; part 265, subpart O; or part 266, subpart H. EPA based its decision to limit the scope of the guidelines, in part, on its determination that wastewater from these exempt facilities would be qualitatively different from the regulated wastewater. The data from a high temperature metals recovery facility confirms this. These data show that wastewater from a high temperature metals recovery facility has higher metals concentrations than typically observed for the regulated facilities.

Comment: Commenter is unsure of the types of IWC wastewater subject to the proposed regulation and thinks it is important to make precisely clear exactly how the regulation of ''other'' IWC wastestreams should be addressed by a permit writer.

Response: Sections 444.1 and 444.2 of the final regulation clearly state the types of wastewater a CHWC (formerly IWC) may generate that are subject to the final regulation. In addition, this preamble to the final rule further explains the regulated wastewaters.

EPA does not agree with this commenter that it is important to make clear exactly how the regulation of ''other'' waste streams should be addressed by a permit writer. EPA did not collect data on these streams. The permitting authority will use BPJ authority to develop limitations that reflect the characteristics of the particular waste streams. However, EPA does agree with the commenter that the ''other'' waste streams should not be subject to CHWC guidelines unless the characteristics of the waste streams are similar to the CHWC streams (e.g. a waste stream that comes into contact with the waste after it is burned would have characteristics similar to regulated CHWC streams.)

Comment: None of the facilities sampled by EPA employed state-of-the-art dioxin air emission controls that will be required for at least some of the facilties covered by the proposed rule. None of the commercial facilities from which EPA obtained its wastewater data employed activated carbon injection (ACI), recently proposed beyond-the-floor MACT by EPA.

Response: EPA did not base the promulgated MACT dioxin emission standards on activated carbon injection (ACI) for approximately 85 percent of the hazardous waste incinerators identified by the HWC final rule. The standards are instead based on rapid quench of the flue gas prior to the particulate matter control device. Although EPA did not sample ACI, as the commenter mentioned, it did sample CHWC facilities with rapid flue gas quench prior to the particulate matter control device. For the 15 percent of hazardous waste incinerators identified by the HWC final rule that have waste heat boilers, EPA promulgated the emission standard based on activated carbon injection.

The commenter is concerned that the low dioxin concentrations found by EPA in the CHWC wastewater sampling program are a result of weak dioxin emission controls. As stated above, EPA sampled facilities with the promulgated HWC control for 85% of hazardous waste incinerators. For the 15% of hazardous waste incinerators that have waste heat boilers, EPA does not anticipate that the addition of ACI will increase the dioxin concentrations found in the wastewater because the ACI control devices specified in the final HWC rule are all ''dry'' carbon systems—either a carbon bed or a fabric filter with dry carbon injection. That is, the dioxin that is removed via the carbon injection will not be added to the wastewater—it will stay with the carbon.

Based on the data available and its resulting decision not to establish limitations and standards for dioxins, EPA cannot justify the imposition of a monitoring program for dioxins. While EPA recognizes that the promulgation of the MACT dioxin emission standards may result in some changes in the volume and character of air pollution control wastewater generated, EPA does not believe that the changes will result in a media transfer for dioxins that would change its decision that it should not establish dioxin limitations and standards. The promulgated MACT standards for 85% of the hazardous waste incinerators in the final HWC rule are based on changes in air pollution control device process conditions to minimize generation of dioxins and furans. Various studies have shown that a significant source of dioxin in waste incinerators is the formation of dioxin in the flue gas as it is cooled to around 400 degrees C. The longer the flue gas is held at this temperature the greater the formation of dioxin. One useful control measure is the rapid cooling of flue gas to levels below this temperature range to minimize this dioxin production window. EPA has concluded that the largest portion of the reduction in dioxin emissions will be through reductions in the amount generated rather than a media transfer.

Comment: Commenter questioned whether EPA conducted the type of data collection analysis necessary to characterize adequately the non-hazardous industry sector that falls within the scope of the proposal.

Response: At the onset of this project, EPA decided to limit the scope of its examination of the combustion industry. Thus EPA's initial planning did not include consideration of limitations and standards for medical waste incinerator or sewage sludge incinerators. Neither did the Agency undertake to revisit some of its existing guidelines for industrial categories which included allowances for wastewater discharges associated with air pollution control equipment for on-site incinerators. As a result of these decisions, EPA tailored its initial data collection to address its perceived needs for this guideline. As a result, EPA agrees that there may be gaps in the data which limit the Agency's ability to adequately characterize wastewater from certain combustion units at such facilities. This is particularly true with respect to non-hazardous combustion operations. As a result, EPA decided that the CHWC guideline would not extend to these facilities as explained earlier. EPA's 1992 data collection efforts for the CHWC Industry identified only one facility generating CHWC wastewater that burned only non-hazardous industrial waste and operated commercially, and this facility regenerated activated carbon.

The CHWC regulation focuses on RCRA combustor units, and includes units that burn both RCRA and non-RCRA wastes. The above definition makes it clear that if a combustor does not burn any RCRA hazardous waste, it is not subject to the rule. The regulation, however, will apply to the CHWC wastewater produced by burning non-hazardous industrial wastes in conjunction with RCRA hazardous waste.

Comment: It is difficult to understand how the Agency could assume that treatment performance data from a single facility could be representative of BPT/BAT performance for this point source category.

Response: Subsequent to the close of the comment period, EPA received wastewater treatment data from three additional CHWC facilities. Each of the three CHWCs submitted influent and effluent wastewater treatment system performance data and related information on the operation of the

treatment systems (referred to as Episodes 6181, 6182, and 6183). Each facility submitted daily measurements for chlorides, total dissolved solids, total suspended solids, sulfate, pH, and 15 metals (aluminum, antimony, arsenic, cadmium, chromium, copper, iron, lead, mercury, molybdenum, selenium, silver, tin, titanium, and zinc).

EPA has reviewed this data and incorporated it into the data base for determining the CHWC limitations. Inclusion of the submitted data followed a careful check to ensure its accuracy, quality, and that it was collected using procedures consistent with EPA sampling and collection standards. EPA has used this information in the calculation of BPT/BAT effluent limitations for the final rule. EPA concluded that two of the three new facilities represented the ''average of the best'' technology for the industry. The remaining facility (Episode 6182) provided insufficient treatment for the profile of metals detected in its wastewaters. Incorporation of the post-proposal data into EPA's database had the effect of increasing the effluent long-term averages for some of the regulated pollutants and decreasing others.

Comment: EPA's proposed MACT standards for Hazardous Waste Combustors overlooked a preferred component of establishing emissions control—reductions in metal feed rates to combustors (pollution prevention)—because combustion of metals is not an appropriate form of treatment for these pollutants.

Response: Combustion of wastes is an appropriate management, treatment, and recovery practice for a wide variety of wastes, including those with trace quantities of metals. EPA rulemaking efforts under the CWA, CAA, and RCRA usually consider multi-media water, air, and solid waste impacts. EPA expects that well-designed, well-operated combustors will reduce the organic components of feed material to near-elemental compounds (carbon dioxide, water, and inorganic salts). However, since the metal components of the feed material are immutable (neither destroyed nor reduced to other elemental compounds), any effort to control or reduce metal pollutants in one medium must recognize the potential ancillary impact on the volumes and pollutant concentrations of the other media.

Further, the commenter's suggestion that EPA's proposed MACT air emission standards for Hazardous Waste Combustors (HWCs) should have considered reductions in metal feed rates as a control technique to limit emissions of metals is outside the scope of this rulemaking. The Agency received many public comments, including substantial comment on the issue of feedrate control of metals and chlorine in the hazardous waste, in response to the HWC MACT proposal and subsequent notices (61 FR 17358 and 62 FR 24212) . These comments were considered in developing the final air emissions standards for HWCs that were promulgated on September 30, 1999 (64 FR 52828). The Agency's comment response document supporting the final rule responds to all comments regarding feedrate control of metals and chlorine in the hazardous waste as MACT control. See *Final Response to Comments to the Proposed HWC MACT Standards, Volume I: Standards,* July 1999, available in docket F–1999–RC2F–FFFFF.

Comment: Some state regulations are more stringent than EPA's proposed regulations for mercury and cadmium. Systems in use have achieved lower mercury levels than EPA has proposed.

Response: The limitations and standards established by EPA in the CHWC regulation are national minimum technology-based standards based on data from CHWCs. States, of course, under the CWA, remain free to establish more stringent discharge limits. In addition, the permit writer or control authority may establish more stringent permit requirements in order, for example, to comply with water quality standards as necessary.

Based on new data received from CHWC facilities, EPA has decided to promulgate standards for PSES identical to the BAT/BPT standards. This technology basis is two stages of chemical precipitation with or without a final sand filtration step. The promulgated mercury and cadmium limits for direct dischargers and indirect dischargers are lower than the proposed mercury and cadmium limits.

B. Summary of Notice of Availability Comments and Responses

Comment: Two commenters want EPA to use the noticed data to set final limitations and standards for the final IWC rule. One commenter also argues that the data submitted illustrates the variability of influent and effluent concentrations for most metals and TSS *between* IWC facilities.

Response: EPA used the submitted data from the CHWC (formerly IWC) facilities that operate BPT/BAT/PSES treatment in development of the final effluent limitations guidelines and standards. EPA only used additional data from two facilities of the three facilities that submitted data in calculating the final limitations and standards. EPA concluded that only these two facilities were operating BPT/BAT/PSES treatment systems. The third facility was operating only one (rather than two) stages of chemical precipitation at the time of its sampling. Inclusion of these data has lead to higher effluent limits for some pollutants and lower effluent limits for others than at proposal.

Additionally, while the Agency recognizes that different facilities will accept variable ranges of hazardous and solid wastes for incineration, the Agency has concluded that the final limitations and standards do not need to take these differences into account. The statistical methods used by the Agency to calculate final limitations and standards do not result in limits that require a discharger to meet a single long-term average value for a particular pollutant. Instead, EPA has designed the final pollutant limits so that any facility employing good engineering practice and an appropriately designed treatment system will perform at least as well, or better than, the average observed performance and variability of the systems whose data were used to develop the limitations. Rather than allowing for between-facility variation, EPA uses the performance of the mean treatment system as a standard to establish limits that a well-operated system should be capable of achieving. However, this standard is not itself a limit. In developing daily maximum and monthly average limits, EPA provides an allowance for average within-facility variation about the average facility's average effluent concentration. Thus, a treatment system designed and operated to achieve the BPT/BAT model long-term average on a consistent basis should have no problem in complying with the limitations. See the comment response document for details.

Comment: One commenter thinks it is important to simulate the level of metals that could be encountered in the course of taking a broad variety of wastes into an Industrial Waste Combustor.

Response: The Agency has taken feed concentrations of metals into account in establishing effluent limits for CHWCs (formerly IWCs). EPA calculates the regulatory limits based on data from multiple facilities which experienced different feed rates over time. EPA does not accept the commenter's conclusion that the spiking simulation validly describes routine CHWC performance. The commenter introduced the spiked metal solutions to the treatment system downstream of the influent sampling point. Without knowing the resulting metal concentrations and without

knowing whether these concentrations are representative of potential loadings, EPA can not use the spiked data in its calculations for the final limitations and standards.

EPA is aware of the RCRA trial burn procedures and understands the techniques regarding waste ''spiking'' for thermal treatment. However, EPA's Office of Water has never used such techniques in developing its technology-based effluent limitations guidelines and standards and does not believe these techniques are appropriate for wastewater treatment technologies. The variability factors calculated by EPA will accommodate any unusual ''spikes'' in metal concentrations experienced by a CHWC facility.

Appendix 1 to the Preamble—Definitions, Acronyms, and Abbreviations

Administrator—The Administrator of the U.S. Environmental Protection Agency.

Agency—The U.S. Environmental Protection Agency.

BAT—The best available technology economically achievable, as described in section 304(b)(2) of the CWA.

BCT—The best conventional pollutant control technology, as described in section 304(b)(4) of the CWA.

Boiler—means an enclosed device using controlled flame combustion and having the following characteristics:

(1)(i) The unit must have physical provisions for recovering and exporting thermal energy in the form of steam, heated fluids, or heated gases; and

(ii) The unit's combustion chamber and primary energy recovery section(s) must be of integral design. To be of integral design, the combustion chamber and the primary energy recovery section(s) (such as waterwalls and superheaters) must be physically formed into one manufactured or assembled unit. A unit in which the combustion chamber and the primary energy recovery section(s) are joined only by ducts or connections carrying flue gas is not integrally designed; however, secondary energy recovery equipment (such as economizers or air preheaters) need not be physically formed into the same unit as the combustion chamber and the primary energy recovery section. The following units are not precluded from being boilers solely because they are not of integral design: Process heaters (units that transfer energy directly to a process stream), and fluidized bed combustion units; and

(iii) While in operation, the unit must maintain a thermal energy recovery efficiency of at least 60 percent, calculated in terms of the recovered energy compared with the thermal value of the fuel; and

(iv) The unit must export and utilize at least 75 percent of the recovered energy, calculated on an annual basis. In this calculation, no credit shall be given for recovered heat used internally in the same unit. (Examples of internal use are the preheating of fuel or combustion air, and the driving of induced or forced draft fans or feedwater pumps); or

(2) The unit is one which the Regional Administrator has determined, on a case-by-case basis, to be a boiler, after considering the standards in 40 CFR 260.32.

BPT—The best practicable control technology currently available, as described in section 304(b)(1) of the CWA.

Captive—Used to describe a facility that only accepts waste generated on site and/or by the owner operator at the facility.

Clean Water Act (CWA)—The Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 *et seq.*), as amended, *inter alia,* by the Clean Water Act of 1977 (Pub. L. 95–217) and the Water Quality Act of 1987 (Pub. L. 100–4).

Closed—A facility or portion thereof that is currently not receiving or accepting wastes and has undergone final closure.

Combustion Unit—A device for waste treatment which uses elevated temperatures as the primary means to change the chemical, physical, biological character or composition of the waste. Examples of combustion units are incinerators, boilers, industrial furnaces, and kilns.

Commercial Hazardous Waste Combustor means any thermal unit, except a cement kiln, that is subject to either to 40 CFR part 264, subpart O; part 265, subpart O; or part 266, subpart H if the thermal unit burns RCRA hazardous wastes received from off-site for a fee or other remuneration in the following circumstances. The thermal unit is a commercial hazardous waste combustor.

Commercial hazardous waste combustor means any thermal unit, except a cement kiln, that is subject to either to 40 CFR Part 264, Subpart O; Part 265, Subpart O; or Part 266, Subpart H if the thermal unit burns RCRA hazardous wastes received from off-site for a fee or other remuneration in the following circumstances. The thermal unit is a commercial hazardous waste combustor if the off-site wastes are generated at a facility not under the same corporate structure or subject to the same ownership as the thermal unit and

(1) The thermal unit is burning wastes that are not of a similar nature to wastes being burned from industrial processes on site or

(2) There are no wastes being burned from industrial processes on site.

Examples of wastes of a ''similar nature'' may include the following: wastes generated in industrial operations whose wastewaters are subject to the same provisions in 40 CFR Subchapter N or wasters burned as part of a product stewardship activity.

The term commercial hazardous waste combustor includes the following facilities: a facility that burns exclusively waste received from off-site; and, a facility that burns both wastes generated on-site and wastes received from off-site. Facilities that may be commercial hazardous waste combustors include hazardous waste incinerators, rotary kiln incinerators, lime kilns, lightweight aggregate kilns, and boilers.

A facility not otherwise a commercial hazardous waste combustor is not a commercial hazardous waste combustor if it burns RCRA hazardous waste for charitable organizations, as a community service or as an accommodation to local, state or government agencies so long as the waste is burned for no fee or other remuneration.

Commercial hazardous waste combustor wastewater means wastewater attributable to commercial hazardous waste combustion operations, but includes only wastewater from air pollution control systems and water used to quench flue gas or slag generated as a result of commercial hazardous waste combustor operations.

Conventional pollutants—The pollutants identified in section 304(a)(4) of the CWA and the regulations thereunder (biochemical oxygen demand (BOD_5), total suspended solids (TSS), oil and grease, fecal coliform, and pH).

Direct discharger—A facility that discharges or may discharge treated or untreated pollutants into waters of the United States.

Disposal—Intentional placement of waste or waste treatment residual into or on any land where the material will remain after closure. Waste or residual placed into any water is not defined as disposal, but as discharge.

Effluent—Wastewater discharges.

Effluent limitation—Any restriction, including schedules of compliance, established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into

navigable waters, the waters of the contiguous zone, or the ocean. (CWA sections 301(b) and 304(b).)

EA—Economic Analysis.

EPA—The U.S. Environmental Protection Agency.

Facility—A facility is all contiguous property owned, operated, leased or under the control of the same person. The contiguous property may be divided by public or private right-of-way.

Hazardous Waste—Any waste, including wastewaters defined as hazardous under RCRA or Toxic Substances Control Act (TSCA).

Incinerator—means any enclosed device that:

(1) Uses controlled flame combustion and neither meets the criteria for classification as a boiler, sludge dryer, or carbon regeneration unit, nor is listed as an industrial furnace; or

(2) Meets the definition of infrared incinerator or plasma arc incinerator.

Indirect discharger—A facility that discharges or may discharge pollutants into a publicly-owned treatment works (POTW).

Industrial Furnace means any of the following enclosed devices that are integral components of manufacturing processes and that use thermal treatment to accomplish recovery of materials or energy:

(1) Cement kilns.

(2) Lime kilns.

(3) Aggregate kilns.

(4) Phosphate kilns.

(5) Coke ovens.

(6) Blast furnaces.

(7) Smelting, melting and refining furnaces (including pyrometallurgical devices such as cupolas, reverberator furnaces, sintering machine, roasters, and foundry furnaces).

(8) Titanium dioxide chloride process oxidation reactors.

(9) Methane reforming furnaces.

(10) Pulping liquor recovery furnaces.

(11) Combustion devices used in the recovery of sulfur values from spent sulfuric acid.

(12) Halogen acid furnaces (HAFs) for the production of acid from halogenated hazardous waste generated by chemical production facilities where the furnace is located on the site of a chemical production facility, the acid product has a halogen acid content of at least 3 percent, the acid product is used in a manufacturing process, and except for hazardous waste burned as fuel, hazardous waste fed to the furnace has a minimum halogen content of 20 percent as generated.

(13) Such other devices as the Administrator may, after notice and comment, add to this list on the basis of one or more of the following factors:

(i) The design and use of the device primarily to accomplish recovery of material products;

(ii) The use of the device to burn or reduce raw materials to make a material product;

(iii) The use of the device to burn or reduce secondary materials as effective substitutes for raw materials, in processes using raw materials as principal feedstocks;

(iv) The use of the device to burn or reduce secondary materials as ingredients in an industrial process to make a material product;

(v) The use of the device in common industrial practice to produce a material product; and,

(vi) Other factors, as appropriate.

Intracompany—A facility that treats, disposes, or recycles/recovers wastes generated by off-site facilities under the same corporate ownership. The facility may also treat on-site generated wastes. If any waste from other facilities not under the same corporate ownership is accepted for a fee or other remunerations, the facility is considered commercial.

Long-term average (LTA)—For purposes of the effluent guidelines, average pollutant levels achieved over a period of time by a facility, subcategory, or technology option. LTAs were used in developing the limitations and standards in today's final regulation.

Minimum level—The level at which an analytical system gives recognizable signals and an acceptable calibration point.

Municipal Facility—A facility which is owned or operated by a municipal, county, or regional government.

New Source—''New source'' is defined at 40 CFR 122.2 and 122.29 for direct discharging facilities and at 40 CFR 403.3 for facilities discharging to a POTW.

Non-commercial facility—A facility that accepts waste from off-site for treatment only from facilities under the same ownership.

Non-conventional pollutants—Pollutants that are neither conventional pollutants listed at 40 CFR 401.16 nor the 126 priority pollutants listed in Appendix A of 40 CFR part 423.

Non-detect value—A concentration-based measurement reported below the sample-specific minimum level that can reliably be measured by the analytical method for the pollutant.

Non-hazardous waste—All waste not defined as hazardous under RCRA regulations.

Non-water quality environmental impact—An environmental impact of a control or treatment technology, other than to surface waters.

NPDES—The National Pollutant Discharge Elimination System authorized under section 402 of the CWA. NPDES requires permits for discharge of pollutants from any point source into waters of the United States.

NSPS—New Source Performance Standards.

OCPSF—Organic Chemicals, Plastics, and Synthetic Fibers industry or Effluent Guideline (40 CFR part 414).

Off-site—''Off-site'' means outside the boundaries of a facility.

On-site—''On-site'' means within the boundaries of a facility.

Outfall—The mouth of conduit drains and other conduits from which a facility effluent discharges into receiving waters or POTWs.

Point source category—A category of sources of water pollutants.

Pollutant (to water)—Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, certain radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.

POTW or POTWs—Publicly-owned treatment works, as defined at 40 CFR 403.3(o).

Pretreatment standard—A regulation that establishes industrial wastewater effluent quality required for discharge to a POTW. (CWA section 307(b).)

Priority pollutants—The pollutants designated by EPA as priority in 40 CFR part 423 Appendix A.

Process wastewater—''Process wastewater'' is defined at 40 CFR 122.2.

PSES—Pretreatment standards for existing sources of indirect discharges, under section 307(b) of the CWA.

PSNS—Pretreatment standards for new sources of indirect discharges, under section 307 (b) and (c) of the CWA.

RCRA—Resource Conservation and Recovery Act (Pub. L. 94–580) of 1976, as amended.

Residuals—The material remaining after a natural or technological process has taken place, e.g., the sludge remaining after initial wastewater treatment.

Sewage Sludge—Sludge generated by a sewage treatment plant or POTW.

Sludge—The accumulated solids separated from liquids during processing.

Solids—For the purpose of this notice, a waste that has a very low moisture content, is not free-flowing, and does not release free liquids. This definition deals with the physical state of the waste, not the RCRA definition.

SIC—Standard Industrial Classification (SIC). A numerical

categorization system used by the U.S. Department of Commerce to catalogue economic activity. SIC codes refer to the products, or group of products, produced or distributed, or to services rendered by an operating establishment. SIC codes are used to group establishments by the economic activities in which they are engaged. SIC codes often denote a facility's primary, secondary, tertiary, etc. economic activities.

Small business—Businesses with annual sales revenues less than $6 million. This is the Small Business Administration definition of small business for SIC code 4953, Refuse Systems (13 CFR Ch. I, § 121.601).

Treatment—Any activity designed to change the character or composition of any waste so as to prepare it for transportation, storage, or disposal; render it amenable for recycling or recovery; or reduce it in volume.

TSS—Total Suspended Solids. A measure of the amount of particulate matter that is suspended in a water sample. The measure is obtained by filtering a water sample of known volume. The particulate material retained on the filter is then dried and weighed.

Waste Receipt—Wastes received for treatment or recovery.

Waters of the United States—See 40 CFR 122.2.

Wastewater treatment system—A facility, including contiguous land and structures, used to receive and treat wastewater. The discharge of a pollutant from such a facility is subject to regulation under the Clean Water Act.

Zero discharge—No discharge of pollutants to waters of the United States or to a POTW. Also included in this definition are ''alternative'' discharges of pollutants by way of evaporation, deep-well injection, off-site transfer, and land application.

List of Subjects in 40 CFR Part 444

Environmental protection, Hazardous waste, Incineration, Incorporation by reference, Waste treatment and disposal, Water pollution control.

Dated: November 30, 1999.

Carol M. Browner,

Administrator.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is amended by adding part 444 to read as follows:

PART 444—WASTE COMBUSTORS POINT SOURCE CATEGORY

Subpart A—Commercial Hazardous Waste Combustor Subcategory

Sec.

Authority: Secs. 301, 304, 306, 307, 308, 402, and 501 of the Clean Water Act, as amended; 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342, and 1361.

Subpart A—Commercial Hazardous Waste Combustor Subcategory

§ 444.10 Applicability.

(a) The provisions of this part apply only to that portion of wastewater discharges that are associated with Commercial Hazardous Waste Combustor (CHWC) wastewater.

(b) The discharge from a CHWC of wastewater that is not CHWC wastewater, may be subject to other applicable provisions of EPA's CWA effluent guidelines and standards regulations at Subchapter N of Title 40 of the Code of Federal Regulations.

§ 444.11 Definitions.

As used in this part the general definitions and abbreviations in 40 CFR part 401 shall apply.

Commercial hazardous waste combustor means any thermal unit, except a cement kiln, that is subject either to 40 CFR part 264, subpart O; 40 CFR part 265, subpart O; or 40 CFR part 266, subpart H if the thermal unit burns RCRA hazardous wastes received from off-site for a fee or other remuneration in the following circumstances. The thermal unit is a commercial hazardous waste combustor if the off-site wastes are generated at a facility not under the same corporate structure or subject to the same ownership as the thermal unit and

(1) The thermal unit is burning wastes that are not of a similar nature to wastes being burned from industrial processes on site or

(2) There are no wastes being burned from industrial processes on site. Examples of wastes of a ''similar nature'' may include the following: Wastes generated in industrial operations whose wastewaters are subject to the same provisions in 40 CFR Subchapter N or wastes burned as part of a product stewardship activity. The term commercial hazardous waste combustor includes the following facilities: a facility that burns exclusively waste received from off-site; and, a facility that burns both wastes generated on-site and wastes received from off-site. Facilities that may be commercial hazardous waste combustors include hazardous waste incinerators, rotary kiln incinerators, lime kilns, lightweight aggregate kilns, and boilers. A facility not otherwise a commercial hazardous waste combustor is not a commercial hazardous waste combustor if it burns RCRA hazardous waste for charitable organizations, as a community service or as an accommodation to local, state or government agencies so long as the waste is burned for no fee or other remuneration.

Commercial hazardous waste combustor wastewater means wastewater attributable to commercial waste combustion operations, but includes only wastewater from air pollution control systems and water used to quench flue gas or slag generated as a result of commercial hazardous waste combustor operations.

Off-site means outside the boundaries of a facility.

On-site means within the boundaries of a facility.

Parameters are defined as Parameters at 40 CFR 136.2 in Table 1B, which also cites the approved methods of analysis.

(1) *Arsenic* means total arsenic, Parameter 6.

(2) *Cadmium* means total cadmium, Parameter 12.

(3) *Chromium* means total chromium, Parameter 19.

(4) *Copper* means total copper, Parameter 22.

(5) *Lead* means total lead, Parameter 32.

(6) *Mercury* means total mercury, Parameter 35.

(7) *pH* means hydrogen ion, Parameter 28.

(8) *Silver* means total silver, Parameter 62.

(9) *Titanium* means total titanium, Parameter 72.

(10) *TSS* means total suspended solids, Parameter 55.

(11) *Zinc* means total zinc, Parameter 75.

POTW means a publicly owned treatment works.

§ 444.12 Monitoring Requirements

(a) Both direct and indirect discharges must monitor to establish compliance with their limitations and standards. Thus, all the permits of all direct

dischargers must include requirements to monitor, according to EPA-approved test procedures, each pollutant limited in the permit, the volume of effluent discharged from each outfall, and other appropriate measurements subject to notification requirements. See 40 CFR 122.44(i). EPA's pretreatment regulations similarly require indirect dischargers to monitor to demonstrate compliance with pretreatment standards. See 40 CFR 403.12(g).

(b) Incorporation by reference:

(1) Compliance with the monitoring requirements may be accomplished using approved test procedures listed in the table to this paragraph. Most of these test procedures have previously been incorporated by reference at 40 CFR 136.3(a), Table IB. The test procedures for the regulated pollutants (arsenic, cadmium, chromium (total), copper, pH, lead, mercury, TSS, silver, titanium, and zinc) listed in the table to this paragraph are also incorporated by reference into this regulation. The full texts of the test procedures listed in this paragraph are available from the sources indicated in paragraph (b)(2) of this section.

(2) In addition to those test procedures incorporated by reference at 40 CFR 136.3(a), Table IB, you may also use EPA Method 200.8, ''Determination of Trace Elements in Water and Wastes by Inductively Coupled Plasma-Mass Spectrometry,'' from ''Methods for Determination of Metals in Environmental Samples—Supplement I,'' EPA–600/R–94–111, May 1994, and ASTM Method D 5673–96, ''Standard Test Method for Elements in Water by Inductively Coupled Plasma—Mass Spectrometry,'' from 1999 Annual Book of ASTM Standards, for determination of arsenic, cadmium, chromium (total), copper, lead, silver, and zinc. The full texts of these methods are incorporated by reference into this regulation and may be obtained from the sources identified in paragraph (b)(2) of this section.

LIST OF APPROVED INORGANIC TEST PROCEDURES

Parameter, units and method	Reference (method number or page)				
	EPA [1 16]	Standard Methods [18th Edition] [6]	ASTM	USGS [2]	Other
1. Arsenic—Total,[4] mg/L:					
Digestion [4] followed by	206.5				
AA gaseous hydride	206.3	3114B 4.d	D2972–93(B)	I–3062–85	
AA furnace	206.2	3113B	D2972–93(C)		
ICP/AES [15]	[5] 200.7	3120 B			
Colorimetric (SDDC), or	206.4	3500–As C	2972–93(A)	I–3060–85	
ICP/MS	[7] 200.8		D5673–96 [17]		
2. Cadmium—Total,[4] mg/L; Digestion [4] followed by:					
AA direct aspiration [15]	213.1	3111 B or C	D3557–90(A or B)	I–3135–85 or I–3136–85	974.27,[3] p. 37.
AA furnace	213.2	3113 B			
ICP/AES [15]	[5] 200.7	3120 B	D3557–90(D)		
DCP [15]				I–1472–85	([14])
Voltametry [9]			D4190–82(88)		
Colorimetric (Dithizone), or		3500–Cd D	D3557–90(C)		
ICP/MS	[7] 200.8		D5673–96 [17]		
3. Chromium-Total,[4] mg/L; Digestion [4] followed by:					
AA direct aspiration [15]	218.1	3111 B	D1687–92(B)	I–3236–85	974.27.[3]
AA chelation-extraction	218.3	3111 C			
AA furnace	218.2	3113 B	D1687–92(C)		
ICP/AES [15]	[5] 200.7	3120 B			
DCP [15]			D4190–82(88)		([14])
Colorimetric (Diphenylcarbazide), or.		3500–Cr D			
ICP/MS	[7] 200.8		D5673–96 [17]		
4. Copper—Total,[4] mg/L; Digestion [4] followed by:					
AA direct aspiration [15]	220.1	3111 B or C	D1688–90(A or B)	I–3270–85 or I–3271–85	974.27 [3] p. 37.[8]
AA furnace	220.2	3113 B	D1688–90(C)		
ICP/AES [15]	[5] 200.7	3120 B			
DCP [15] or			D4190–82(88)		([14])
Colorimetric (Neocuproine) or		3500–Cu D			
(Bicinchoninate), or		or E			([10])
ICP/MS	[7] 200.8		D5673–96 [17]		
5. Hydrogen ion (pH), pH units:					
Electrometric measurement	150.1	4500–H+B	D1293–84 (90)(A or B)	I–1586–85	973.41.
Automated electrode					([11])
6. Lead—Total,[4] mg/L; Digestion [4] followed by:					
AA direct aspiration [15]	239.1	3111 B or C	D3559–90(A or B)	I–3399–85	974.27.[3]
AA furnace	239.2	3113 B	D3559–90(D)		
ICP/AES [15]	[5] 200.7	3120 B			
DCP [15]			D4190–82(88)		([14])
Voltametry [9]			D3559–90(C)		
Colorimetric (Dithizone), or		3500–Pb D			
ICP/MS	[7] 200.8		D5673–96 [17]		

LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter, units and method	Reference (method number or page)				
	EPA [1 16]	Standard Methods [18th Edition] [6]	ASTM	USGS [2]	Other
7. Mercury—Total,[4] mg/L:					
Cold vapor, manual or	245.1	3112 B	D3223–91	I–3462–85	977.22.[3]
Automated	245.1				
8. Residue—nonfilterable (TSS), mg/L:					
Gravimetric, 103–105– post washing of residue.	160.2	2540 D		I–3765–85	
9. Silver—Total,[4] mg/L: Digestion [4,12] followed by:					
AA direct aspiration	272.1	3111 B or C		I–3720–85	974.27 [3] p. 37. [8]
AA furnace	272.2	3113 B			
ICP/AES	[5] 200.7	3120 B			
DCP, or					(14)
ICP/MS	[7] 200.8		D5673–96 [17]		
10. Titanium—Total,[4] mg/L; Digestion [4] followed by:					
AA direct aspiration	283.1	3111 D			
AA furnace, or	283.2				
DCP					(14)
11. Zinc—Total,[4] mg/L; Digestion [4] followed by:					
AA direct aspiration [15]	289.1	3111 B or C	D1691–90(A) or B)	I–3900–85	974.27,[3] p. 37.[8]
AA furnace	289.2				
ICP/AES [15]	[5] 200.7	3120 B			
DCP [15]					(14)
Colorimetric (Dithizone) or		3500–Zn E	D4190–82(88)		
(Zincon), or		3500–Zn F			(13)
ICP/MS	[7] 200.8		D5673–96 [17]		

Table Notes:

[1] "Methods for Chemical Analysis of Water and Wastes," Environmental Protection Agency, Environmental Monitoring Systems Laboratory—Cincinnati (EMSL–CI), EPA–600/4–79–020, Revised March 1983 and 1979 where applicable.

[2] Fishman, M.J., et al. "Methods for Analysis of Inorganic Substances in Water and Fluvial Sediments," U.S. Department of the Interior, Techniques of Water—Resource Investigations of the U.S. Geological Survey, Denver, CO, Revised 1989.

[3] "Official Methods of Analysis of the Association of Official Analytical Chemists," methods manual, 15th ed. (1990).

[4] For the determination of total metals the sample is not filtered before processing. A digestion procedure is required to solubilize suspended material and to destroy possible organic-metal complexes. Two digestion procedures are given in "Methods for Chemical Analysis of Water and Wastes, 1979 and 1983". One (Section 4.1.3), is a vigorous digestion using nitric acid. A less vigorous digestion using nitric and hydrochloric acids (Section 4.1.4) is preferred; however, the analyst should be cautioned that this mild digestion may not suffice for all samples types. Particularly, if a colorimetric procedure is to be employed, it is necessary to ensure that all organo-metallic bonds be broken so that the metal is in a reactive state. In those situations, the vigorous digestion is to be preferred making certain that at no time does the sample go to dryness. Samples containing large amounts of organic materials may also benefit by this vigorous digestion, however, vigorous digestion with concentrated nitric acid will convert antimony and tin to insoluble oxides and render them unavailable for analysis. Use of ICP/AES as well as determinations for certain elements such as antimony, arsenic, the noble metals, mercury, selenium, silver, tin, and titanium require a modified sample digestion procedure and in all cases the method write-up should be consulted for specific instructions and/or cautions. NOTE.—If the digestion procedure for direct aspiration AA included in one of the other approved references is different than the above, the EPA procedure must be used.

Dissolved metals are defined as those constituents which will pass through a 0.45 micron membrane filter. Following filtration of the sample, the referenced procedure for total metals must be followed. Sample digestion of the filtrate for dissolved metals (or digestion of the original sample solution for total metals) may be omitted for AA (direct aspiration or graphite furnace) and ICP analyses, provided the sample solution to be analyzed meets the following criteria:

a. Has a low COD (<20)

b. Is visibly transparent with a turbidity measurement of 1 NTU or less

c. Is colorless with no perceptible odor, and

d. Is of one liquid phase and free of particulate or suspended matter following acidification.

[5] EPA Method 200.7, "Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes," from "Methods for Determination of Metals in Environmental Samples—Supplement I," EPA–600/R–94–111, May 1994.

[6] "Standard Methods for the Examination of Water and Wastewater," 18th Edition (1992).

[7] EPA Method 200.8, "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry," from "Methods for Determination of Metals in Environmental Samples—Supplement I," EPA–600/R–94–111, May 1994.

[8] American National Standard on Photographic Processing Effluents, Apr. 2, 1975. Available from ANSI, 1430 Broadway, New York, NY 10018.

[9] The use of normal and differential pulse voltage ramps to increase sensitivity and resolution is acceptable.

[10] Copper, Biocinchoinate Method, Method 8506, Hach Handbook of Water Analysis, 1979, Hach Chemical Company, PO Box 389, Loveland, CO 80537.

[11] Hydrogen ion (pH) Automated Electrode Method, Industrial Method Number 378—75WA, October 1976, Bran & Luebbe (Technicon) Autoanalyzer II. Bran & Luebbe Analyzing Technologies, Inc., Elmsford, NY 10523.

[12] Approved methods for the analysis of silver in industrial wastewaters at concentrations of 1 mg/L and above are inadequate where silver exists as an inorganic halide. Silver halides such as the bromide and chloride are relatively insoluble in reagents such as nitric acid but are readily soluble in an aqueous buffer of sodium thiosulfate and sodium hydroxide to pH of 12. Therefore, for levels of silver above 1 mg/L, 20 mL of sample should be diluted to 100 mL by adding 40 mL each of 2 M $Na_2S_2O_3$ and NaOH. Standards should be prepared in the same manner. For levels of silver below 1 mg/L the approved method is satisfactory.

[13] Zinc, Zincon Method, Method 8009, Hach Handbook of Water Analysis, 1979, pages 2–231 and 2–333, Hach Chemical Company, Loveland, CO 80537.

[14] "Direct Current Plasma (DCP) Optical Emission Spectrometric Method for Trace Elemental Analysis of Water and Wastes, Method AES0029," 1986—Revised 1991, Thermo Jarrell Ash Corporation, 27 Forge Parkway, Franklin, MA 02038.

[15] ''Closed Vessel Microwave Digestion of Wastewater Samples for Determination of Metals,'' CEM Corporation, PO. Box 200, Matthews, NC 28106–0200, April 16, 1992. Available from the CEM Corporation.

[16] Precision and recovery statements for the atomic absorption direct aspiration and graphite furnace methods, and for the spectrophotometric SDDC method for arsenic are provided in Appendix D of 40 CFR Part 136 and titled, ''Precision and Recovery Statements for Methods for Measuring Metals.''

[17] This method does not include the digestion for solids given in Method 200.8. Not using the solids digestion procedure could affect the determined concentrations. Therefore, this method may not be used for analysis of aqueous samples with suspended solids greater than 1%.

(2) The full texts of the methods from the following references which are cited in the table in paragraph (b)(1) of this section are incorporated by reference into this regulation and may be obtained from the sources identified. All costs cited are subject to change and must be verified from the indicated sources. The full texts of all the test procedures cited are available for inspection at the Analytical Methods Staff, Office of Water, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460 or at the Office of the Federal Register, 800 North Capital Street, NW., Suite 700, Washington DC.

Appendix to § 444.12(b)—References, Sources, Costs, and Table Citations:

(1) ''Methods for Chemical Analysis of Water and Wastes,'' U.S. Environmental Protection Agency, EPA–600/4–79–020, Revised March 1983 and 1979 where applicable. Available from: ORD Publications, CERI, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268. [Note 1]

(2) ''Standard Methods for the Examination of Water and Wastewater.'' Joint Editorial Board, American Public Health Association, American Water Works Association, and Water Environment Federation, 18th Edition, 1992. Available from: American Public Health Association, 1015 15th Street NW, Washington, DC 20005. [Note 6]

(3) ''Annual Book of ASTM Standards—Water and Environmental Technology,'' Section 11, Volumes 11.01 (Water I) and 11.02 (Water II), 1994. [1996 for D5673–96; see Note 17]. American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

(4) ''Methods for the Determination of Metals in Environmental Samples—Supplement I'', National Exposure Risk Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH 45268, EPA 600 R–94/111, May 1994. [Notes 5 and 7]

(5) ''Methods for Determination of Inorganic Substances in Water and Fluvial Sediments,'' by M.J. Fishman and Linda C. Friedman, Techniques of Water Resources Investigations of the U.S. Geological Survey, Book 5 Chapter A1 (1989). Available from: U.S. Geological Survey, Denver Federal Center, Box 25425, Denver, CO 80225. Cost: $108.75 (subject to change). [Note 2]

(6) ''Closed Vessel Microwave Digestion of Wastewater Samples for Determination of Metals,'' CEM Corporation, P.O. Box 200, Matthews, North Carolina 28106–0200, April 16, 1992. Available from the CEM Corporation. [Note 15]

(7) ''Official Methods of Analysis of AOAC—International, 15th Edition,'' 1990. Price: $359.00. Available from: AOAC—International, 1970 Chain Bridge Rd., Dept. 0742, McLean, VA 22109–0742. [Note 3]

(8) ''American National Standard on Photographic Processing Effluents,'' April 2, 1975. Available from: American National Standards Institute, 11 West 42nd Street, New York, New York 10036. [Note 8]

(9) Bicinchoninate Method for Copper. Method 8506, Hach Handbook of Water Analysis, 1979, Method and price available from Hach Chemical Company, P.O. Box 300, Loveland, Colorado 80537. [Note 10]

(10) Hydrogen Ion (pH) Automated Electrode Method, Industrial Method Number 378–75WA. October 1976. Bran & Luebbe (Technicon) Auto Analyzer II. Method and price available from Bran & Luebbe Analyzing Technologies, Inc. Elmsford, N.Y. 10523. [Note 11]

(11) Zincon Method for Zinc, Method 8009. Hach Handbook for Water Analysis, 1979. Method and price available from Hach Chemical Company, P.O. Box 389, Loveland, Colorado 80537. [Note 13]

(12) ''Direct Current Plasma (DCP) Optical Emission Spectrometric Method for Trace Elemental Analysis of Water and Wastes,'' Method AES 0029, 1986 Revised 1991, Thermo Jarrell Ash Corporation (508–520–1880), 27 Forge Parkway, Franklin, MA 02038. [Note 14]

§ 444.13 Effluent limitations attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT:

EFFLUENT LIMITATIONS [1]

Regulated parameter	Maximum daily	Maximum monthly avg.
TSS	113,000	34,800
Arsenic	84	72
Cadmium	71	26
Chromium	25	14
Copper	23	14
Lead	57	32
Mercury	2.3	1.3
Silver	13	8
Titanium	60	22
Zinc	82	54
pH	(2)	(2)

[1] Micrograms per liter (ppb)
[2] Within the range 6 to 9.

§ 444.14 Effluent limitations attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BCT: Limitations for TSS and pH are the same as the corresponding limitation specified in § 444.13.

§ 444.15 Effluent limitations attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BAT: Limitations for arsenic, cadmium, chromium, copper, lead, mercury, silver, titanium and zinc are the same as the corresponding limitation specified in § 444.13.

§ 444.16 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any source that introduces wastewater pollutants into a POTW must comply with part 403 and achieve the following pretreatment standards:

PRETREATMENT STANDARDS [1]

Regulated parameter	Maximum daily	Maximum monthly avg.
Arsenic	84	72
Cadmium	71	26
Chromium	25	14
Copper	23	14
Lead	57	32

PRETREATMENT STANDARDS [1]—Continued

Regulated parameter	Maximum daily	Maximum monthly avg.
Mercury	2.3	1.3
Silver	13	8
Titanium	60	22
Zinc	82	54

[1] Micrograms per liter (ppb)

§ 444.17 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following performance standards: Standards for TSS, arsenic, cadmium, chromium, copper, lead, mercury, silver, titanium, zinc and pH are the same as the corresponding limitation specified in § 444.13.

§ 444.18 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any source that introduces wastewater pollutants into a POTW must comply with 40 CFR part 403 and achieve the following pretreatment standards: Standards for arsenic, cadmium, chromium, copper, lead, mercury, silver, titanium and zinc are the same as the corresponding limitation specified in § 444.16.

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