ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 464

[FRL-2898-7]

Metal Molding and Casting Industry Point Source Category Effluent Limitations Guidelines, Pretreatment Standards and New Source Performance Standards

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final regulation.

SUMMARY: This regulation establishes effluent limitations guidelines and standards that limit the discharge of pollutants into navigable waters and publicly owned treatment (POTWs) by existing and new sources engaged in metal molding and casting operations. The Clean Water Act and a consent decree require EPA to issue this regulation.

EPA is promulgating effluent limitations guidelines attainable by the application of the "best practicable control technology currently available" (BPT) and the "best available technology economically achievable" (BAT), pretreatment standards applicable to existing and new discharges to POTWs (PSES and PSNS, respectively), and new source performance standards (NSPS) attainable by the application of the "best available demonstrated technology."

DATES: In accordance with 40 CFR Part 23 (50 FR 7268, February 21, 1985), this regulation shall be considered issued for purposes of judical review at 1:00 p.m. Eastern time on November 13, 1985. These regulations shall become effective December 13, 1985.

The compliance date for pretreatment standards for existing sources PSES is October 31, 1988. The compliance date for new source performance standards (NSPS) and pretreatment standards for new sources (PSNS) is the date the new source begins operation.

Under section 509(b)(1) of the Clean Water Act, judicial review of this regulation can be made only by filing a petition for review in the United States Court of Appeals within 90 days after the regulation is considered issued for purposes of judicial review. Under section 509(b)(2) of the Clean Water Act, the requirements in this regulation may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

ADDRESSES: The basis for this regulation is detailed in four major documents. See Section XV—Availability of Technical Information for information on those documents. Copies of the technical and economic documents may be obtained from the National Technical Information Service, Springfield, Virginia 22161 (Phone: (703) 487–4600). For additional technical information, contact Mr. Donald F. Anderson, Industrial Technology Division (WH–552), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460 (Phone (202) 382–7189). For additional economic information, contact Ms. Dena Caldwell, Office of Analysis and Evaluation (WH–586), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460 (Phone (202) 382–5397).

On January 3, 1986, the complete public record for this rulemaking, including the Agency's responses to comments received during rulemaking, will be available for review in EPA's Public Information Reference Unit, Room 2404 (Rear) (EPA Library), 401 M Street, SW., Washington, DC. The EPA public information regulation (40 CFR Part 2) provides that a reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Mr. Donald F. Anderson at (202) 382–7189.

SUPPLEMENTARY INFORMATION:

Overview

This preamble describes the legal authority, background, the technical and economic bases, and other aspects of the final regulation. The abbreviations, acronyms, and other terms used in the Supplementary Information sections are defined in Appendix A to this notice.

Organization of This Notice

I. Legal Authority

This regulation is promulgated under the authority of sections 301, 304, 306, 307, 308, and 501 of the Clean Water Act

(the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1251 *et seq.*, as amended by the Clean Water Act of 1977, Pub. L. 95–217), also referred to as "the Act". It is also promulgated in response to the Settlement Agreement in *Natural Resources Defense Council, Inc.* v. *Train*, 8 ERC 2120 (D.D.C. 1976), *modified*, 12 ERC 1833 (D.D.C. 1979), *modified* by Orders dated October 26, 1982, August 2, 1983, January 6, 1984, July 5, 1984, and January 7, 1985.

II. Scope of This Rulemaking

This final regulation, which was proposed on November 15, 1982 (47 FR 51512), establishes effluent limitations guidelines and standards for existing and new metal molding and casting facilities. The metal molding and casting category includes those plants that remelt and cast metal. These plants form a cast intermediate or final product by pouring or forcing the molten metal into a mold.

For the purpose of this final rule, the metal molding and casting category is divided into four subcategories and 28 process segments. The pollutants regulated for each of the subcategory segments under the BPT, BAT, NSPS, PSES, and PSNS regulations are identified in Appendix B.

EPA is promulgating BPT effluent limitations guidelines for four subcategories of the metal molding and casting category. BCT effluent limitations guidelines are reserved until the promulgation of the final BCT methodology. EPA is promulgating NSPS equal to BAT effluent limitations for each subcategory segment being regulated. BAT limitations more stringent than BPT limitations are being promulgated for the copper and zinc casting subcategories and for the ferrous subcategory except for (a) plants where steel is the primary metal cast or (b) plants pouring less than 3,557 tons of metal per year where malleable iron is the primary metal cast. BAT limitations equal to BPT limitations are being promulgated for the aluminum casting subcategory and for direct dischargers in the ferrous subcategory where steel is the primary metal cast and for direct dischargers pouring less than 3,557 tons of metal per year where malleable iron is the primary metal cast. PSES and PSNS are being promulgated equal to BAT for all subcategories except in the ferrous subcategory for indirect dischargers pouring less than 1,784 tons of metal per year where gray iron is the primary metal cast. In this case, PSES and PSNS are equal to BPT. Indirect dischargers in the metal molding and casting category also must comply with 40 CFR Part 403—General Pretreatment Regulations, in addition to PSES and PSNS.

III. Background

A. The Clean Water Act

The Federal Water Pollution Control Act Amendments of 1972 established a comprehensive program to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." (Section 101(a).) To implement the Act, EPA was required to issue effluent limitations guidelines, pretreatment standards, and new source performance standards for industrial dischargers.

In addition to these regulations for designated industrial categories, EPA was required to promulgate effluent limitations and standards applicable to all dischargers of toxic pollutants. The Act included a timetable for issuing these standards. However, EPA was unable to meet many of the deadlines and, as a result, in 1976, it was sued by several environmental groups. In settling this lawsuit, EPA and the plaintiffs executed a "Settlement Agreement" that was approved by the Court. This agreement required EPA to develop a program and adhere to a schedule for controlling 65 "priority" toxic pollutants and classes of pollutants. In carrying out this program, EPA must promulgate BAT effluent limitations guidelines, pretreatment standards, and new source performance standards for 21 major industries. See *Natural Resources Defense Council, Inc.* v. *Train*, 8 ERC 2120 (D.D.C. 1976), *modified*, 12 ERC 1833 (D.D.C. 1979), *modified* by Orders dated October 26, 1982, August 2, 1983, January 6, 1984, July 5, 1984, and January 7, 1985.

Many of the basic elements of the Settlement Agreement were incorporated into the Clean Water Act of 1977. Like the Agreement, the Act stressed control of toxic pollutants, including the 65 "priority" toxic pollutants and classes of pollutants. In addition to strengthening the toxic control program, Section 304(e) of the Act authorizes the Administrator to prescribe "best management practices" (BMPs) to prevent the release of toxic and hazardous pollutants from plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage associated with, or ancillary to, the manufacturing or treatment process.

Under the Act, the EPA is to establish several different kinds of effluent limitations guidelines and standards. These are discussed in detail in the preamble to the proposed regulation and in the proposed technical Development Document. They are summarized briefly below:

1. Best Practicable Control Technology Currently Available (BPT)

BPT effluent limitations guidelines are generally based on the average of the best existing performance by plants of various sizes, ages, and unit processes within the category or subcategory for control of familiar (i.e., classical) pollutants.

In establishing BPT effluent limitations guidelines, EPA considers the total cost in relation to the effluent reduction benefits, the age of equipment and facilities involved, the processes employed, process changes required, engineering aspects of the control technologies, and non-water quality environmental impacts (including energy requirements). The Agency balances the category-wide or subcategory-wide cost of applying the technology against the effluent reduction benefits.

2. Best Available Technology Economically Achievable (BAT)

BAT effluent limitations guidelines, in general, represent the best existing performance in the category or subcategory. The Act establishes BAT as the principal national means of controlling the direct discharge of toxic and nonconventional pollutants to navigable waters.

In establishing BAT, the Agency considers the age of the equipment and facilities involved, the processes employed, the engineering aspects of the control technologies, process changes, the cost of achieving such effluent reduction, and non-water quality environmental impacts.

3. Best Conventional Pollutant Control Technology (BCT)

The 1977 Amendments to the Clean Water Act added section 301(b)(2)(E), establishing "best conventional pollutant control technology" (BCT) for the discharge of conventional pollutants from existing industrial point sources. Section 304(a)(4) designated the following as conventional pollutants: BOD, TSS, fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease a conventional pollutant on July 30, 1979 (44 FR 44501).

BCT is not an additional limitation but replaces BAT for the control of conventional pollutants. In addition to other factors specified in section 304(b)(4)(B), the Act requires that the BCT effluent limitations guidelines be assessed in light of a two part "cost-

reasonableness" test. *American Paper Institute* v. *EPA*, 660 F.2d 954 (4th Cir. 1981). The first test compares the cost for private industry to reduce its discharge of conventional pollutants with the costs to publicly owned treatment works for similar levels of reduction in their discharge of these pollutants. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find that limitations are "reasonable" under both tests before establishing them as BCT. In no case may BCT be less stringent than BPT.

EPA has not yet promulgated a methodology for establishing BCT effluent limitations guidelines. Therefore, in today's rulemaking, EPA is not establishing BCT effluent limitations guidelines for the metal molding and casting category. When the final BCT methodology is promulgated, EPA will use this methodology to determine whether BCT effluent limitations guidelines should be established for the four subcategories of the metal molding and casting category.

4. New Source Performance Standards (NSPS)

NSPS are based on the performance of the best available demonstrated technology (BDT). New plants have the opportunity to install the best and most efficient production processes and wastewater treatment technologies.

5. Pretreatment Standards for Existing Sources (PSES)

PSES are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of publicly owned treatment works (POTWs). They must be achieved within three years of promulgation. The Clean Water Act of 1977 requires pretreatment standards for toxic pollutants that pass through POTWs in amounts that would violate direct discharger effluent limitations guidelines or interfere with either the POTW's treatment process or chosen sludge disposal method. The legislative history of the 1977 Act indicates that pretreatment standards are to be technology-based, analogous to the BAT effluent limitations guidelines for removal of toxic pollutants. EPA generally determines that there is pass through of toxic pollutants if the nation-wide average percentage of toxic pollutants removed by a well-operated POTW achieving secondary treatment is less than the percent removed by the BAT model treatment system. The General Pretreatment Regulations, which serve as the framework for categorical pretreatment standards, are found at 40 CFR Part 403.

6. Pretreatment Standards for New Sources (PSNS)

Like PSES, PSNS are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of a POTW. PSNS are to be issued at the same time as NSPS. New indirect dischargers, like new direct dischargers, have the opportunity to incorporate in their plant the best available demonstrated technologies. The Agency considers the same factors in promulgating PSNS as it considers in promulgating NSPS.

B. Overview of the Industry

Metal molding and casting plants are included within the United States Department of Commerce, Bureau of the Census Standard Industrial Classification (SIC) Major Group 33-Primary Metal Industries. Those parts of this Major Group 33 covered by this regulation are the Subgroup SIC Nos. 3321, 3322, 3324, 3325, 3361, 3362, and 3369. The types of metal associated with these SIC codes and considered for regulation under this category are: gray iron, ductile iron, malleable iron, steel, aluminum, copper, magnesium, and zinc and their respective alloys. The casting of these metals represents over 98 percent of the total of all metals cast in the country. The Agency also considered for regulation the casting of nickel, tin, and titanium but has determined that no process wastewater pollutants result from the casting of these metals.

The Agency's data from a 1977 survey of the industry indicate that over 3,600 commercial casting plants are located in the United States employing approximately 300,000 workers and producing over 19 million tons per year of cast products. Plants in this industry include both "job shops" (plants that sold 50 percent or more of their production to customers outside the corporate entity) and "captive plants" (plants that sold 50 percent or more of their products internally or were used within the corporate entity). They vary greatly in metal cast, production, wastewater source and volume, size, age, and number of employees.

Annual castings production has ranged between 15 and 20 million tons during most of the last 20 years. Ferrous castings have accounted for about 90 percent of the total tons produced annually since 1956.

The number of smaller ferrous foundries has dropped dramatically in the past 20 years, while the number of large and medium size ferrous foundries has moderately increased. Among the nonferrous metals, aluminum casting has been increasing whereas the trends for the other metals are mixed. There is a trend toward a decreasing percentage of zinc casting shipments compared with total metal molding and casting shipments and compared to aluminum casting shipments.

Metal casting is done in several ways, and the selection and use of a particular manufacturing process, e.g., type of mold medium, is often governed by the type of metal cast and by the intricacy and tolerances required of the cast product. However, the variety of manufacturing processes can be typified by essentially six standard process steps: (1) Metal is remelted in a furnace, (2) molds are prepared, (3) the molten metal is poured or injected into a mold, (4) the mold medium is separated from the casting, (5) the casting is cooled, and (6) the casting is further processed before shipment.

Of the 3853 commercial metal molding and casting plants projected to operate in the United States in 1986, only 1059 will generate process wastewater. Among the 1059 plants, 259 will have no discharge of process wastwater, 301 will discharge directly to surface waters, and 499 will discharge indirectly to POTWs.

Water is used throughout these various process steps at plants with process wastewater discharges. Process water becomes contaminated either through its use in air pollution control devices associated with the various manufacturing processes or through direct contact of the water with some part of the process or casting. The pollutant characteristics of the resulting wastewaters may vary depending on the type of metal cast, the manufacturing process employed, and the type of air pollution control device associated with the manufacturing process. About 80 percent of the wastewater associated with metal molding and casting operations is generated by air pollution control devices. This wastewater does not contact directly the products cast.

The most significant pollutants and pollutant properties present in metal molding and casting industry wastewaters are suspended solids, oil and grease, copper, lead, zinc, nickel, iron, aluminum, nonconventional phenols, pentachlorophenol, parachlorometa cresol, chrysene, benzo(a)pyrene, benzo(a)anthracene, benzo-(b)fluoranthene, benzo(k)fluoranthene, pyrene, dichloromethane, trichloromethane, bis(2-ethyl hexyl) phthalate, and pH.

C. Applicability

For the purpose of this final rule, these regulations are applicable to wastewater discharges from metal molding and casting plants included within the United States Department of Commerce, Bureau of the Census Standard Industrial Classification (SIC) Major Group 33—Primary Metal Industries. Those parts of major group 33 covered by this regulation are subgroup SIC Nos. 3321, 3322, 3324, 3325, 3361, 3362, and 3369. Twenty-eight process segments in four subcategories are specifically covered by these regulations.

The casting of copper ingots, pigs, or other cast shapes is covered under these regulations. The casting of ingots, pigs, or other cast shapes related to primary nonferrous metal smelting (except copper smelting) are not included in this category; these operations are covered under regulations for the nonferrous metals manufacturing category (see 40 CFR Part 421). Whenever the casting of aluminum or zinc is performed as an integral part of aluminum or zinc forming and is located on-site of an aluminum or zinc forming plant, then the aluminum casting operation is covered by the aluminum forming regulations (see 40 CFR Part 467) and the zinc casting operations are covered under the nonferrous forming regulations (see 40 CFR Part 471). The casting of ferrous ingots, pigs, or other cast shapes is primarily a dry operation involving no process wastewater and, consequently, no regulations have been developed covering this operation.

In general, these regulations do not cover processing operations following the cooling of castings (see previous section "Overview of the Industry"). These processing operations, if not covered under 40 CFR Part 467 or 471, are covered by effluent limitations and standards applicable to electroplating and metal finishing. See 46 FR 9462 [January 28, 1981, Part 413] and 47 FR 38462 [August 31, 1982, Parts 413 and 433]. The exceptions include grinding scrubber operations in the aluminum, ferrous, and copper casting subcategories.

IV. Methodology and Data Gathering Efforts

The Agency has gathered background information and supporting data for this regulation since 1974. A substantial portion of the data gathering and analysis efforts occurred before the regulation was proposed. Additional data were obtained after proposal and analyses were performed using these data. These additional data and the analysis results were made available for public comment.

The initial methodology and data gathering efforts used in developing the proposed metal molding and casting regulation were summarized in the preamble to the proposed regulation (47 FR 51512; November 15, 1982) and were described in detail in the *Proposed Development Document for Effluent Limitations Guidelines and Standards for the Metal Molding and Casting (Foundries) Point Source Category* (U.S. EPA, November, 1982).

In summary, before proposal, EPA studied the metal molding and casting category to determine whether differences in the raw materials, final products, manufacturing processes, equipment, age and size of plants, water use, wastewater characteristics, or other factors required the development of separate effluent limitations guidelines and standards for different segments (or subcategories) of the category. This study included the identification of raw waste characteristics, sources and volumes of water used, processes employed, and sources of wastewater. Sampling and analysis of specific wastewaters enabled EPA to determine the presence and concentration of pollutants in wastewater discharges.

EPA also identified wastewater control and treatment technologies for the metal molding and casting category. The Agency analyzed data on the performance, operational constraints, and reliability of these technologies. In addition, EPA considered the impacts of these technologies on air quality, solid waste generation, water scarcity, and energy requirements.

The Agency estimated the costs of each control and treatment technology considered using cost equations based on standard engineering analyses. EPA derived control technology costs for model plants representative of the metal molding and casting plants in the Agency's data base. The Agency then evaluated the potential economic impacts of these costs on the category.

The Agency also developed a financial profile for model plants representative of the plants in EPA's data base using production data from Data Collection Portfolios (DCPs) and financial data from publicly available data. Using financial information and compliance cost estimates, the impacts of the proposed regulations on plants with a discharge were determined. Those impacts were extrapolated to the estimated total number of plants in the metal molding and casting category that discharge wastewaters directly or indirectly to navigable waters.

Following publication of the proposed regulations on November 15, 1982 (see 47 FR 51512), the Agency received numerous comments. A number of significant issues were raised by the commenters; these included the feasibility of complete recycle, the validity of the data base supporting complete recycle, the treatment effectiveness data base, the magnitude of the discharges from die casting operations, the accuracy of EPA's estimates of compliance costs, and the projected economic impacts of the proposed regulations. Comments relating to these issues prompted the Agency to verify its technical data base and to reconsider many aspects of the proposed regulations.

After a review of the data base, the Agency corrected, as appropriate, the errors noted in the comments relating to previously-reported data. As part of these efforts, the Agency made a number of comment verification requests to plants that submitted comments on the proposed regulations or were cited specifically in comments submitted by others. These comment verification activities are discussed in the Agency's first notice of availability and request for comments published in the **Federal Register** on March 20, 1984 at 49 FR 10280. Also discussed in the March 20, 1984 notice are the results of the Agency's analyses of the supplemented data base and any appropriate modifications to or confirmations of the underlying facets of the proposed regulations. The Agency also solicited comments and information concerning a number of other aspects of the rulemaking.

On February 15, 1985, the Agency published, at 50 FR 6572, another notice of availability and request for comments concerning additional data that were gathered and analyses that were completed after March 20, 1984. In the February 15 notice, the Agency summarized the major issues raised in comments on its March 20, 1984 notice and requested additional specific information.

The Agency has reviewed all information received since its November 15, 1982 proposal and the publication of the two notices of availability just described. EPA used the new data and information to analyze and respond to public comments. To the extent that new information confirmed arguments made by commenters, EPA revised its regulatory options and performed additional analyses to evaluate the revised options. These additional analyses and the regulatory options considered by EPA as the bases for the

final regulations are discussed in more detail in the following sections of the preamble.

V. Summary of Changes to Proposed Regulations

In reviewing comments on the proposed regulations and on the March 1984 and February 1985 notices, the Agency conducted extensive analyses of existing data and new data and information submitted by the commenters. As a result, the Agency has made several changes to the proposed regulations. These are summarized below. Where changes have been made as a direct result of comments, this is noted in the following discussions.

A. Industry Coverage

At proposal, the Agency identified 19 process segments in six metal molding and casting subcategories for which it proposed regulations. The subcategories were aluminum, copper, ferrous, lead, magnesium, and zinc casting. The Agency is promulgating final regulations for four of these subcategories (aluminum, copper, ferrous, and zinc casting). The lead casting subcategory operations were transferred to the battery manufacturing category as noted in the Agency's first post-proposal notice of availability (see 49 FR 10280). No regulations are being promulgated for the magnesium casting subcategory for the reasons explained in the next section of this preamble. In this rulemaking, the Agency is promulgating final regulations covering 28 process segments of the metal molding and casting category. The Agency identified additional processes not covered in the proposed regulations which are found at many metal molding and casting plants. Some process segments were combined (e.g., die lube and die casting, now die casting), and some combined process segments (casting quench and mold cooling) were separated into individual process segments. These 28 process segments are as follows:

Subpart A—Aluminum Casting Subcategory

- Casting cleaning
- Casting quench
- Die casting
- Dust collection scrubber
- Grinding scrubber
- Investment casting
- Melting furnace scrubber
- Mold cooling

Subpart B—Aluminum Casting Subcategory

- Casting quench
- Direct chill casting
- Dust collection scrubber
- Grinding scrubber
- Investment casting
- Melting furnace scrubber
- Mold cooling

Subpart C—Ferrous Casting Subcategory

- Casting cleaning
- Casting quench
- Dust collection scrubber
- Grinding scrubber
- Investment casting
- Melting furnace scrubber
- Mold cooling
- Slag quench
- Wet sand reclamation

Subpart D—Zinc Casting Subcategory

- Casting quench
- Die casting
- Melting furnace scrubber
- Mold cooling

These changes were described in the March 1984 notice, and no adverse comments were received.

B. Applied Flow Basis of the Regulations

During the Agency's post-proposal data gathering, review, and analysis efforts, additional applied flow data were acquired and incorporated into the data base. Median production normalized applied flow rates were listed in Appendix F of the March 20, 1984 **Federal Register** notice at 49 FR 10309–10310, for each of 31 process segments then considered for regulation. Only those applied flow rates applicable to certain of the melting furnace scrubber and dust collection scrubber process segments were questioned in comments on the March 20, 1984 notice. These comments focused on the production normalizing factors (tons of metal poured versus air flow through wet scrubbers) used to develop mass-based limitations for scrubbers. (See the Production Normalizing Parameters discussion later in this section.)

Not all responses to EPA comment verification requests had been received by March 20, 1984. Additional data, including applied flow data, were received after publication of the March 1984 notice; additional analyses were performed after these new data were received. A listing of revised median production normalized applied flows was included in Appendix A of the February 15, 1985 **Federal Register** notice of availability at 50 FR 6579.

The Agency received comments on the February 15, 1985 notice which questioned the decreases in some applied flow rates from those published in the March 20, 1984 notice. The process segments specifically noted as having applied flows that decreased were as follows: aluminum die casting, aluminum mold cooling, copper direct chill casting, and zinc die casting. Other comments questioned applied flow rates for certain other process segments and stated they should be increased. These include the ferrous melting furnace scrubber, the ferrous dust collection, and the zinc melting furnace scrubber process segments. Applied flow data for specific plants with wet scrubbers also were questioned. Finally, a few commenters stated that cupola melting furnaces that have been installed recently have been designed with recuperative energy recovery; they asserted that the air flow normalized applied flow for these new cupolas is much higher than the applied flow allowed by EPA for the ferrous melting furnace scrubber process segment (see Appendix A, February 15, 1985 notice at 50 FR 6579). It was further asserted that additional flow allowances were necessary for multiple venturis, quenchers, after coolers, fan washes, and other ancillary water used in a scrubber system described by one commenter.

The Agency has reviewed plant data used in developing production normalized applied flow rates for the process segments, including all of those cited by the commenters. The Agency also has reviewed the process definitions utilized for these segments to ensure that the data were used properly. As a result of this review, a number of changes have been made to applied flow rates, including clarification of process definitions for die casting and ferrous melting furnace scrubber operations. Appendix J lists the production normalized applied flow rates to be utilized for developing mass-based limitations and standards for all 28 process segments to be included in the promulgated regulations. The most significant changes were clarification of the definition of die casting to exclude data for process waters at some plants that incorporated mold cooling and/or casting quench process wastewater with die casting process wastewater. Similarly, mold cooling data were reviewed for the aluminum and zinc subcategories, where they often are combined with die casting data. Mold cooling data for the copper and ferrous subcategories also were reviewed.

The Agency reviewed the data for the cupola melting furnaces installed in recent years at plants in the ferrous casting subcategory and found that these data did not support the commenters' assertions that these processes required higher flow rates. In fact, the newer designs with below-the-

charge gas take-off for scrubbers had almost the identical air flow normalized applied flow rates as for the older designs. The Agency found that after segregation of the data from plants with multiple scrubbers, the applied flow rate for ferrous melting furnace scrubbers decreased. The Agency did find, however, that where more than one scrubbing device, such as both a fixed and variable venturi or a fixed venturi and a quencher, is used in series to scrub a given gas stream, water use was found to be significantly greater. Thus, effluent limitations and standards for ferrous casting plants having multiple scrubbing devices in series to scrub a given air stream will be based upon the summation of the median applied flow for each of the scrubbing devices. A more detailed discussion of how applied flows were developed is presented in the technical Development Document. Each of the applied flows which changed from the values included in the February 15, 1985 notice is discussed below.

The process definition for die casting was clarified to exclude wastewaters other than die casting wastewaters, such as mold cooling and casting quench wastewaters. Detailed review of the plant files revealed that some of the applied flow data that had been attributed to die casting wastewaters contained noncontact water; these data were excluded. In addition, a substantial number of die casting plants submitted flow data after the close of the comment period for the March 20, 1984 notice. A significant portion of the plants with die casting operations include casting of both aluminum and zinc in the same plant. Therefore, the revised applied flow data bases for aluminum and zinc have been combined, and the resulting median applied flow of 41.4 gallons per ton has been applied to the aluminum (previously 106 gallons per ton) and zinc (previously 109 gallons per ton) die casting process segments. The separate effluent limitations and standards that are established for the mold cooling, casting quench, and other process segments will apply for these processes when they are employed at aluminum and zinc die casting plants.

The Agency reviewed the applied flow data for all of the mold cooling process segments. Detailed review of plant files revealed that some of the applied flow data in the copper and zinc subcategories included noncontact cooling water. In the aluminum subcategory, a number of data points that had been used in the die casting process segment were removed and added to mold cooling as the result of the clarification in the die casting process definition. This was true also for zinc mold cooling where some data from die casting was added. In addition, some data for noncontact cooling water leakage was added to the aluminum mold cooling data base. Data representing commingled noncontact cooling water were removed from the data base and revised median flow rates developed. The applied flow rate for aluminum mold cooling changed from 506 gallons per ton to 1,850 gallons per ton. The applied flow rate for copper mold cooling changed from 5,530 gallons per ton to 2,450 gallons per ton. The applied flow rate for zinc mold cooling changed from 4,000 gallons per ton to 1,890 gallons per ton.

The Agency also reviewed applied flow data for investment casting. Limited data were available for copper and ferrous investment casting. Water use for these processes typically is high on a production normalized basis. However, the amount of metal poured and the total flow of process wastewater typically is small. The production processes are similar and, therefore, water use should be similar, and so the Agency combined all available applied flow data and developed a new median applied flow rate, 17,600 gallons per ton, to be used for all three investment casting process segments. The aluminum investment casting applied flow rate was 20,800 gallons per ton; the copper investment casting applied flow rate was 764 gallons per ton; and the ferrous investment casting applied flow rate was 300 gallons per ton.

The applied flow rate for copper direct chill casting was 4,018 gallons per ton in the March 20, 1984 notice. Additional data were received and the applied flow rate included in the February 15, 1985 notice was 3,130 gallons per ton. One plant submitted revised data to correct data in the record. Other plant flow data were found to be in error. After correcting all data errors, the Agency recalculated the median applied flow rate for this process segment. The revised median applied flow rate used to develop the final regulations is 5,780 gallons per ton.

The preceding discussions noted that energy efficient cupola melting furnaces installed recently at ferrous plants did not require higher air flow normalized applied flow rates. These cupolas exhibited flow rates virtually the same as for older cupola designs. However, the Agency segregated data for plants with more than one scrubber in series in a given air stream, so that only plants with single scrubbers remained. The water to air ratio decreased somewhat from 13.6 gallons per 1000 standard cubic feet to 10.5 gallons per 1000 standard cubic feet. Ferrous plants with more than one scrubbing device in series in a given air stream will have limitations and standards based upon an applied flow rate of 10.7 gallons per 1000 standard cubic feet for each of the scrubbing devices.

The applied flow data for zinc melting furnace scrubbers also was reviewed. We found that the median applied flow (water to air) ratio was very low when compared to the water to air flow ratios for the other melting furnace scrubber process segments even though this process is very similar as employed in all three regulated nonferrous subcategories. Because the melting furnace scrubber process is similar for all nonferrous subcategories, water to air ratio data for all nonferrous melting furnace scrubbers were combined to establish the basis for the zinc subcategory. The median of that combined data base was 6.07 gallons per 1000 standard cubic feet and is being used for the zinc melting furnace scrubber process segment.

In response to comments, the Agency reviewed other applied flow data as well. For example, one commenter asserted that 3.0 gallons per 1000 standard cubic feet was too stringent for dust collection scrubbers, and that the upper end of the typical range of water to air ratios (3–5 gallons per 1000 standard cubic feet) asserted to be used in scrubber design should be adopted for all scrubbers. Another commenter asserted that a number of the water to air ratios for individual plants in the data base could not be verified or were otherwise considered questionable. Upon review, the Agency has found that these water to air flow data appear to be valid, and the resulting median water to air ratios are correct and achievable based on available data. Therefore, no other changes in applied flow data were warranted.

C. Complete Recycle/No Discharge

In the proposed regulation, no discharge of pollutants based on complete recycle of process wastewater was proposed for 14 of 19 process segments of the metal molding and casting category.

Subsequent to the proposal, the Agency found that there were numerous reporting errors by plants in its complete recycle/no discharge data base. Responses to additional inquiries sent to all plants in the complete recycle/no discharge data base revealed that an appreciable number of plants were

discharging wastewaters on an intermittent basis (once per week to once every five years). Some plants were disposing of wastewaters on land and thus not discharging wastewaters to waters of the United States or POTWs; however, these plants were not demonstrating complete recylce. In summary, the portion of the industry for which complete recycle is demonstrated is much smaller than the Agency believed at proposal. Therefore, the Agency reevaluated completely achievable recycle rates, primarily through evaluation of recycle rates demonstrated within the industry. The Agency also developed a model of recycle systems to better understand the water chemistry of these systems, to assist in identifying achievable ranges of recycle rates, and to supplement the data base for the processes for which recycle experience within the industry was limited. With the assistance of the recycle model, the Agency determined the sensitivity of recycle rates to make-up water quality and sludge moisture content, the effectiveness of chemical addition to control scaling and corrosion, and the sensitivity of attainable recycle rates to recycle from central treatment facilities.

After consideration of demonstrated recycle rates by plants in the industry and after appropriate adjustments based on recycle model analysis, the Agency is promulgating effluent limitations guidelines and standards developed with discharge flow allowances based on high rate recycle for 25 of the 28 regulated process segments of the metal molding and casting category. No discharge of pollutants based on complete recycle of process wastewater is being required in the final BPT, BAT, NSPS, PSES, and PSNS regulations for the grinding scrubber process segments in the aluminum, copper, and zinc subcategories.

A summary of recycle rates used to determine mass-based blowdown flow allowances is presented in Appendix J. It should be noted that the recycle rates presented in Appendix J of this preamble are the same as presented in Appendix A of the February 15, 1985 notice. For a detailed explanation of how these recycle rates were determined, see the February 1985 notice and the technical Development Document. It also must be noted that the recycle rates per se are not being regulated by EPA. The recycle rates are being used to develop production normalized flows which, in turn, are used with treatment effectiveness concentrations and variability factors to develop mass-based limitations. Discussions of treatment effectiveness and variability, mass-based effluent limitations and standards, and development of permit limitations are presented in the following sections of this preamble and in the technical Development Document.

D. Regulated Pollutants

The Agency proposed regulations controlling the discharge of pH, TSS, oil and grease, lead, zinc, phenols (4AAP), acenaphthene, 2,4,6-trichlorophenol, parachlorometacresol, chloroform, phenol, butyl benzyl phthalate, chrysene, and tetrachloroethylene as appropriate for those process segments for which discharge of pollutants were allowed. In the proposed technical Development Document, the Agency presented alternative effluent limitations and standards based on 90 percent recycle and 50 percent recycle. These alternate limitations and standards would also have controlled the discharge of copper. The March 20, 1984 and February 15, 1985 notices indicated EPA was considering regulating pH, TSS, oil and grease, total phenols (4AAP), total toxic organics (TTO), copper, lead, and zinc.

The final regulations control the discharge of TSS, oil and grease, pH, copper, lead, zinc, total phenols (4AAP), and TTO for a number of process segments of the metal molding and casting category. Where TTO is regulated, an alternate monitoring parameter (oil and grease) may be substituted, as explained late in the preamble.

Selection of pollutants being regulated is based on the presence of these pollutants in treatable concentrations. Recalculation of raw wastewater characteristics from the data presented in the March 20, 1984 and February 15, 1985 notices has resulted in somewhat different raw wastewater concentrations and loads. Taking into account raw waste variability, the Agency anticipates that copper, lead, and zinc will be found in treatable concentrations across all process segments. EPA has reached this conclusion, in part, because, where copper, lead, or zinc data were unavailable, treatable levels of the toxic metal pollutant were present in the discharges from other regulated processes employed within the subcategory. Therefore, the Agency is regulating copper, lead, and zinc for all process segments. After re-evaluating the raw waste load data, the Agency found phenols (4AAP) above treatable concentrations in raw wastewaters for ten process segments and toxic organic pollutants in treatable concentrations in raw wastewaters for 22 process segments.

A summary of the development of treatment effectiveness concentrations for all regulated pollutants is presented in the "Treatment Effectiveness Data Base" discussion later in this section of the preamble. A listing of pollutants regulated for each subcategory is presented in Appendix B of this preamble. The specialized definitions sections of the regulation (§§ 464.11, 464.21, 464.31, and 464.41) present a list of toxic organic pollutants which are controlled by means of the TTO (total toxic organics) parameter in each process segment.

E. Production Normalizing Parameters

Production normalizing parameters are used to correlate wastewater volume (flow rate) and pollutant loads to production or production related activities. The Agency received comments on the March 20, 1984 notice which asserted that the production normalizing parameter for wet scrubbers should be air flow through the scrubbers rather than tons of metal poured and tons of sand handled, which were used for developing the mass-based limitations discussed in the preamble of the proposed rule (alternative limitations for options based on 90 percent and 50 percent recycle) and the March 20, 1984 notice. The Agency reviewed the statistical correlation analysis supporting the use of tons of metal and tons of sand handled as the normalizing parameters and found that a computer programming error had been made rendering the results invalid.

The correlation analysis was rerun for wet scrubbers comparing water use to tons of metal poured, tons of sand used, and air flow. The results confirmed the commenters' assertions that air flow through scrubbers is the most appropriate normalizing parameter for the scrubber-based process segments. On the basis of this finding, water use ratios (gallons per minute per 1000 standard cubic feet per minute—gpm per scfm) were calculated separately for all scrubber-based process segments in each separate metal subcategory. These data were presented in summary form in Appendix A of the February 15, 1985 notice at 50 FR 6579, and in the record. The median water use ratios for wet scrubbers served as the basis for developing the compliance costs for model plants and as the production normalizing parameter for developing mass-based effluent limitations and standards. As discussed in a preceding section of this preamble, two of these water to air ratios, for the ferrous and

zinc melting furnace scrubber process segments, were changed in response to comments on the February 15, 1985 notice. See Appendix J of this preamble. Also, see the technical Development Document.

The production normalized applied and blowdown flow rates shown in Appendix J of this preamble are expressed as a function of scrubber air flow (gpm per 1000 scfm, or gallons per 1000 scf). Also, the Agency determined that the most appropriate normalizing parameter for the ferrous wet sand reclamation process segment was the tons of sand reclaimed.

In summary, the Agency has determined that the most appropriate production normalizing parameters are: (a) Air flow through scrubbers for the melting furnace scrubber and dust collection scrubber process segments (grinding scrubbers are not included because no discharge allowance is provided), (b) tons of metal poured for the casting cleaning, casting quench, die casting, investment casting, mold cooling, and slag quench process segments, and (c) tons of sand reclaimed for the wet sand reclamation process segment of the ferrous casting subcategory.

F. Control and Treatment Technologies Considered

1. Treatment Technology Components

The treatment technology components used in the systems which served as the basis for the proposed regulations included both in-plant and end-of-pipe components. The components were as follows:

a. *In-Plant Controls:* In-plant controls were based primarily upon process wastewater recycle. The results of application of recycle (recycle rates) and the limitations and operational requirements (e.g., scaling and corrosion control) has been discussed in detail in the proposal, the March 20, 1984 notice at 49 FR 10265–10295, and the February 15, 1985 notice at 40 FR 6573–6574, 6579 (Appendix A). Appendix J of this preamble presents a summary tabulation of achievable recycle rates used in the development of the final effluent limitations and standards. These recycle rates generally have decreased from 100 percent recycle as proposed for most process segments, and thus allow for treated wastewater discharges. Complete recycle with no discharge allowance has been retained for the three grinding scrubber process segments. The recycle rates presented in Appendix J have not changed from those presented in the February 15, 1985 notice.

b. *End-of-Pipe Treatment Components:* The end-of-pipe treatment components considered at proposal included chemical precipitation and sedimentation, generally referred to as lime and settle. Additional components were as follows: chemical emulsion breaking, oil skimming, filtration, and carbon adsorption. These technologies were summarized at 47 FR 51516–51517, discussed in detail in Section VII of the proposed technical Development Document. In the March 20, 1984 notice, at 49 FR 10297, the Agency indicated consideration of and described additional components including simple settling, chemical oxidation by potassium permanganate, and biological oxidation. In the February 15, 1985 notice, at 49 FR 6575, the Agency indicated that it was also considering including in the lime and settle treatment train enhanced metals removal prior to filtration. The technologies considered were the addition of chemicals to effect metal sulfide and metal carbonate precipitation, and more extensive application among process segments of chemical oxidation to minimize the potential for metals complexing by organic compounds. No other components were considered in developing the final regulations.

2. Control Technology Options

These control technology components were incorporated into control and treatment technology options which serve as the primary basis for the proposed regulations and options considered in the subsequent two notices. In the March 20, 1984 notice, each of the eleven generic processes was determined to require the same technology components for each technology option in all subcategories. The treatment technology options were discussed for each of the eleven generic process segments in the March 20, 1984 notice, at 49 FR 10297–10299. The Agency further simplified the identification of these options in the February 15, 1985 notice, at 50 FR 6575, and 6579–6580 (Appendix B). The basic structure and treatment functions of these options has not been changed since proposal with only minor modifications as described in the two notices. These options, which are identical to those described in the February 15, 1985 notice (see 50 FR 6575), are discussed throughout the balance of this preamble and, for ease of reference, they are repeated here.

a. *Option 1: Recycle, Simple Settle:* This Option is comprised of high rate recycle achieved by settling (and free oil skimming), recycle to the process (including pH adjustment for some processes for scaling and corrosion control, and cooling towers for some processes to remove heat), followed by simple settling of the blowdown stream. This Option was developed as a less costly treatment option in the event that a substantial number of closures might occur, especially among small plants, due to the cost of recycle, lime and settle (Option 2). However, upon recalculation of raw wasteloads and further review of wastewater treatability, the Agency has concluded that Option 1 is not applicable to metal molding and casting wastewaters. The Agency's economic impact analysis showed that, for direct dischargers, there would be only one plant closure at Option 2 that would not also occur at Option 1. Moreover, simple settling does not provide removal of heavy metals, emulsified oils, and phenols from these wastewaters. Therefore, the Agency has not considered blowdown treatment by simple settling to be the best practicable control technology for any portion of this industry.

b. *Option 2: Recycle, Lime and Settle:* This Option augments Option 1 by the addition of chemicals (e.g., lime and polymer) to effect hydroxide precipitation of metals and coagulation of solids prior to settling. Option 2 for aluminum, copper, and ferrous dust collection process segments, the aluminum, copper, ferrous, and zinc melting furnace scrubber process segments, and the ferrous wet sand reclamation process segment include chemical (potassium permanganate) oxidation of the blowdown stream to treat phenolic and other organic compounds. This Option includes sequential emulsion breaking, oil skimming, and chemical (potassium permanganate) oxidation of the entire stream prior to lime and polymer addition and settling followed by recycle to the process for aluminum and zinc die casting.

The Agency has concluded that Option 2 is the minimum BPT technology which can be installed to remove heavy metals, emulsified oil and grease, and phenolic and organic compounds in metal molding and casting wastewaters. Generically, lime and settle treatment, including emulsion breaking, is both available and has been widely applied in this industry. Both short-term EPA data and long-term industry Discharge Monitoring Report (DMR) data are available to characterize the effectiveness of this technology.

Final limitations and standards for total phenols are based on levels achieved at plants employing high rate

recycle plus lime and settle treatment. These plants do not use chemical oxidation technology. For this reason, EPA believes that many plants in this industry will be able to achieve the total phenols limitations and standards without applying chemical oxidation. In those cases where total phenols limitations and standards cannot be met using recycle and lime and settle treatment alone, compliance can be attained through the use of chemical oxidation (potassium permanganate addition). Thus, the Agency has included potassium permanganate addition as part of the model technology for those 10 process segments containing treatable levels of total phenols. Additionally, data from an industry study and an EPA study confirm that the effluent limitations and standards are readily achievable with the additional removal effected by chemical oxidation at those plants that cannot achieve the limitations and standards through the application of recycle and lime and settle treatment alone.

c. *Option 3: Recycle, Lime and Settle, Filtration:* This Option adds filtration of the treated effluent from technologies employed for Option 2 for all process segments to remove residuals of toxic heavy metals and suspended solids. Filtration technology is considered by EPA to be among the best available technologies (BPT) for further treatment of lime and settle (BPT) effluents. This technology is available and has been applied at full scale in at least three plants in this industry.

The Agency has not adopted residual metals removal either by second stage sulfide precipitation or by second stage carbonate precipitation. We have determined that the concentrations of metals residuals that remain after the application of lime and settle treatment technology are well within the range of concentrations observed for other, related industries. These levels are not sufficiently high to justify the added expense of two-stage chemical addition and clarification. For this industry, the Agency believes that filtration would be effective and less costly than the application of second clarification step.

d. *Option 4: Recycle, Lime and Settle, Filtration, Activated Carbon Adsorption:* This Option adds removal of residuals of toxic organic compounds by granular activated carbon columns. This Option was considered for application in further treating Option 3 effluents in the event that treatable concentrations of organics would be present after the application of the Option 3 model technology. This is a technology that is commonly evaluated as a means of removing residual organic compounds. The technology has limited application in the metal molding and casting industry (it has been applied at two metal molding and casting plants) and is an available technology.

Upon completing our review of treatment system performance in the metal molding and casting industry, we found that those plants that employed effective oil and grease removal technologies effectively removed toxic organic pollutants. For this reason, EPA rejected Option 4 as the technology basis for nationally-applicable effluent limitations guidelines and standards. Treatment effectiveness information for activated carbon technology, based on theoretical treatability concentrations, are presented in the technical Development Document supporting the final regulations.

e. *Option 5: Complete Recycle/No Discharge:* This Option is applicable only to the three grinding scrubber process segments where complete recycle/no discharge has been demonstrated and is achievable, and therefore is considered to be the best practicable technology (BPT). This option is comprised of simple settling (e.g., drag tank) and complete recycle of all wastewater back to the process (including pH adjustment for scaling and corrosion control).

3. Treatment Systems Considered for Generic Processes

The technologies described below were considered as the bases for the regulations for each of the eleven generic metal molding and casting processes. The technologies are essentially the same technologies described in the March 1984 and February 1985 notices, as described below. Where the process was included in the proposed regulation, the model treatment system proposed at that time is also discussed. The design and cost of installing and operating the model treatment systems for each generic process will vary across metal subcategories due to differences in applied process water flow rates, recycle and blowdown wastewater flow rates requiring treatment, and the pollutant concentrations in the blowdown (i.e., O&M costs for chemical addition to destroy phenols, precipitate metals, and maintain high rates of recycle if necessary). These variations also will result in different rates of mass discharge, thus supporting the subcategorization scheme based on metal type.

As noted in the proposed technical Development Document, the treatment systems considered by EPA are similar or identical to treatment systems now in place in the industry. The only exceptions to this are chemical oxidation by potassium permanganate which has received limited application in this industry, but has been shown on a bench-scale basis to be very effective in removing readily-oxidizable organics, and granular activated carbon which has been used at only two plants in this industry.

In the March 20, 1984 notice of availability, at 49 FR 10296–10299, the Agency indicated that it was considering less than complete recycle for 27 of the 31 process segments then being considered for regulation. Lime and settle blowdown treatment was being considered for these 27 process segments. Aluminum and zinc die casting included emulsion breaking and lime and settle inside the recycle loop. The Agency also indicated it was considering further treatment by filtration for residual metals removal and activated carbon for residual organics removal. For aluminum and zinc die casting, filtration was not considered necessary inside the recycle loop.

Chemical (potassium permanganate) oxidation was an additional technology component incorporated in lime and settle (Option 2) in the February 15, 1985 notice of availability, at 50 FR 6575. The Agency also indicated it was considering once-through (with no recycle) treatment of wastewater by simple settling and lime and settle, where economic impacts were identified at Option 1 and where these technologies were less costly than Option 1. Treatment train schematic diagrams are presented in the record for each of these generic process segments.

a. *Casting Cleaning:* This process was not included in the proposed regulation. Based on data gathered since the time of proposal, as discussed in the March 1984 notice, the Agency has determined that casting cleaning is a foundry process suitable for regulation in the ferrous and aluminum subcategories.

Casting cleaning wastewaters contain elevated levels of solids, oil and grease, and toxic metal pollutants. The treatment components considered as model technologies for the casting cleaning process included process wastewater settling followed by recycle, chemical addition to maintain recycle, and treatment of the blowdown stream through lime and polymer addition and settling in a clarifying device equipped with oil skimming (Option 2). Filtration (Option 3) was also considered.

b. *Casting Quench:* The casting quench process is included for all four

metal groups. The wastewater from this process was found to vary somewhat from metal group to metal group, but, in all metal groups, high levels of suspended solids, oils and greases, and toxic metals were detected.

The model treatment system included in the proposed regulation consisted of sedimentation followed by complete recycle over cooling towers. In developing the final regulations, the Agency considered sedimentation in a drag tank with oil skimming, followed by recycle with chemical addition to maintain recycle (with recycle over a cooling tower at larger plants), and blowdown treatment through the application of lime and settle treatment including polymer addition (Option 2). Filtration (Option 3) and activated carbon (Option 4) also were considered.

c. *Die Casting:* As described previously, the die casting process description has been revised to include wastewater contributions from waste die lubricants. Casting quench and mold cooling wastewaters are not included as part of this process. Most wastewater constituents originate in leaks from the die casting machine hydraulic systems, and die lubricant solutions. The combined wastewater from the die casting process, though it can be of small volume at numerous plants, is highly contaminated. High levels of toxic metals and toxic organic pollutants were detected at all six die casting plants sampled by EPA. The wastewater also is contaminated with high levels of suspended solids, phenols, and emulsified and free oils and greases.

At proposal, a range of technologies was considered for die casting operations. The model treatment system for zinc die casting included sedimentation, oil skimming, and complete recycle. The proposed aluminum die casting model included physical-chemical treatment by emulsion breaking, hydroxide precipitation, sedimentation, and filtration, followed by recycle.

In developing the final regulations, the Agency considered a modified lime and settle technology which consists of emulsion breaking, oil skimming, chemical oxidation with potassium permanganate, lime and polymer precipitation and sedimentation in a clarifier, followed by recycle with chemical addition to maintain recycle (Option 2). This system treats the entire wastewater volume prior to recycle. Blowdown treatment by filtration (Option 3) and carbon adsorption (Option 4) also were considered.

Biological treatment technology is a viable alternative but was not considered as the basis for the final regulations. This alternative would consist of equalization tanks, followed by an activated sludge biological treatment system consisting of aeration, chemical feed systems, sedimentation, sludge return lines, followed by filtration.

d. *Direct Chill Casting:* As discussed in the March 1984 notice, this process is being regulated by the Agency under the metal molding and casting category within the copper casting subcategory only. This process was not separately identified as a distinct casting process in the proposed regulation. The principal pollutants of concern in direct chill casting wastewaters are toxic metals, suspended solids, and oil and grease.

The treatment components considered by the Agency to control the levels of these pollutants include sedimentation (drag tank) followed by recycle over a cooling tower and chemical addition to maintain recycle, and treatment of the blowdown flow by oil skimming, lime and polymer precipitation, and sedimentation in a clarifier (Option 2). Also, filtration (Option 3) was considered.

e. *Dust Collection:* The Agency is regulating the dust collection process in all metal groups except zinc. The wastewater from the dust collection process can contain high levels of toxic metals, suspended solids, and oil and grease. Also, at several plants, high levels of phenols (4AAP) and several organic toxic pollutants were detected.

The model treatment system included in the proposed regulation for dust collection consisted of sedimentation (drag tank) with oil skimming followed by complete recycle. The treatment system considered in developing the final regulations includes sedimentation (e.g., drag tank) followed by recycle with chemical addition to maintain recycle, with blowdown flow being treated by oil skimming, chemical oxidation with potassium permanganate, lime and polymer precipitation and sedimentation in a clarifier (Option 2). Filtration (Option 3) and carbon adsorption (Option 4) also were considered. This blowdown treatment would control the high levels of toxic metal pollutants and the toxic organic pollutants and phenolic compounds found in dust collection wastewaters.

f. *Grinding Scrubber:* The Agency is regulating the grinding scrubber process in the aluminum, copper, and ferrous subcategories. Grinding scrubber wastewaters contain elevated levels of suspended solids, oil and grease, and several toxic metals.

The model treatment system included in the proposed regulation for the grinding scrubber process consisted of sedimentation followed by complete recycle with no discharge including chemical addition to maintain recycle. This is the same technology identified in the March 1984 and February 1985 notices and considered in developing the final regulations.

g. *Investment Casting:* As discussed in the March 1984 notice, the Agency is regulating the investment casting process for the aluminum, copper, and ferrous subcategories. At proposal, investment casting was included only in the aluminum subcategory. The wastewater for this process segment contains high levels of suspended solids and moderate amounts of oil and grease, and toxic metals.

The model treatment system included in the proposed regulation consisted of lime addition followed by sedimentation in a clarifier with no recycle. The model system now includes a drag tank followed by recycle based on the results of the recycle model analysis. Chemical addition is included to maintain recycle. The blowdown from the recycle system is treated by lime and settle (Option 2). Also, filtration (Option 3), to remove metals residuals, and activated carbon (Option 4), to remove residual organics, were considered.

h. *Melting Furnace Scrubber:* The Agency is regulating the melting furnace scrubber process in all metal groups. The wastewaters from this process contain treatable levels of toxic metals, suspended solids, and oils and greases. Also, treatable levels of phenols (4AAP) and organic toxic pollutants were detected.

The model treatment system included in the proposed regulation for the melting furnace scrubber process varied slightly depending upon the major metal group, but generally consisted of sedimentation followed by recycle (aluminum and zinc) or complete recycle (ferrous), with provisions for oil skimming, chemical addition, and sedimentation in a clarifier. Solids removed from the system would be dewatered by vacuum filters. In the zinc subcategory, potassium permanganate addition also was included to reduce the high levels of phenols (4AAP) found in zinc melting furnace scrubber wastewater.

The treatment system considered as a model for the final regulation for this process consists of sedimentation (drag tanks) followed by high rate recycle with chemical addition to maintain recycle. Blowdown treatment consists of oil skimming, chemical oxidation by potassium permanganate, lime and polymer addition and sedimentation in a

clarifier (Option 2) to control solids and metals. Filtration (Option 3) and carbon adsorption (Option 4) also were considered.

i. *Mold Cooling:* The Agency is regulating the mold cooling process for all metal groups. The wastewater from this process contains treatable levels of suspended solids, oil and grease, and toxic metals. Additionally, the temperature of the process wastewater is elevated, and numerous plants use cooling towers to maintain acceptable temperature levels when high rate recycle is practiced.

The model treatment system included in the proposed regulation consisted of sedimentation followed by complete recycle over a cooling tower. The treatment system considered as a model for developing the final regulations consisted of a drag tank followed by recycle with chemical addition to maintain recycle (with recycle over a cooling tower for larger plants), and blowdown treatment by oil skimming, lime addition and sedimentation in a clarifier (Option 2). Filtration (Option 3) also was considered.

j. *Slag Quench:* The Agency is regulating the slag quench process in the ferrous subcategory, the only metal group where slag is water quenched. The wastewater from this process contains treatable levels of suspended solids and toxic metals.

The model treatment system included in the proposed regulation consisted of sedimentation in a drag tank followed by complete recycle. The Agency considered as the basis for final regulations a system including a drag tank followed by recycle with chemical addition to maintain recycle, with blowdown treatment to include lime and polymer precipitation and sedimentation in a clarifier (Option 2). Filtration (Option 3) also was considered for removal of residual metals and activated carbon (Option 4) was considered for removal of residual organics.

k. *Wet Sand Reclamation:* The Agency is regulating the wet sand reclamation process (formerly the "sand washing" process) in the ferrous casting subcategory. The primary pollutants of concern in this process are suspended solids, phenols (4AAP), toxic organics, and toxic metals, primarily copper, lead, and zinc.

The model treatment system utilized for the proposed regulation consisted of settling in drag tanks, chemical addition for phenol destruction and metals precipitation, sedimentation in a clarifier, and complete recycle.

The Agency considered as the basis for the final regulations a model treatment system for the wet sand reclamation process consisting of the following: primary sedimentation with oil skimming followed by recycle with chemical addition to maintain recycle, with blowdown treatment consisting of chemical addition (for metals precipitation and phenol destruction) and sedimentation in a clarifier (Option 2). Filtration (Option 3) and carbon adsorption (Option 4) also were considered.

G. Treatment Effectiveness Data Base

1. Lime and Settle (Option 2)

At proposal and in the March 1984 and February 1985 notices, the Agency described several methods of developing treatment effectiveness values reflective of the application of high rate recycle and lime and settle treatment including oil removal by emulsion breaking and/or skimming and phenol removal by the addition of potassium permanganate.

a. *Metals:* The Combined Metals Data Base (CMDB) is a data base, from well-operated lime and settle treatment systems employed by plants in various industries, that was used to establish lime and settle treatment effectiveness for several industrial point source categories. At proposal, the Agency used the CMDB as the basis for establishing proposed treatment effectiveness concentrations for lime and settle treatment of wastewaters for those process segments in which complete recycle with no discharge was not proposed. Numerous commenters criticized the Agency for using a data base from industrial sources asserted to be unrelated to the metal molding and casting industry. These commenters stated that limitations should be based on data from treatment systems applied in the metal molding and casting industry. The Agency's methodology for developing limitations from the CMDB also was criticized.

In response to comments on the proposal, the Agency acquired Discharge Monitoring Report (DMR) data on the performance of treatment systems at metal molding and casting facilities. The Agency also assembled data acquired under its supervision by sampling at plants in the industry. The March 20, 1984 notice at 49 FR 10292–10295, presented the statistical methodology used to analyze these EPA and DMR data and the results of the analyses. In brief, the Agency found that (a) raw wastewaters in this industry were similar statistically to those in the CMDB industries, and (b) treated effluent concentrations also were similar to treated effluent concentrations based on the CMDB, with the exception of lead and zinc concentrations based on DMR data. Lead and zinc final effluent concentrations were higher than the CMDB final effluent concentrations.

Subsequent to the March 1984 notice, the Agency obtained additional DMR data. The February 15, 1985 notice, at 50 FR 6575–6576, presented the results of the analyses of the expanded DMR data base and the EPA data base. The Agency developed three approaches to analyze treatment effectiveness data. The first method used short-term EPA data together with long-term DMR data for plants where short-term EPA data were available and confirmed the DMR data. The second method used only short-term EPA data. The third method used short-term EPA plus DMR data for all plants whether or not EPA data were available for confirmation of the DMR data. Long-term DMR data were considered confirmed in cases where EPA short-term sampling data were available for the same plant and, preferably, the same period of time covered by the DMR data, and where the short-term data were consistent with the long-term DMR data. The EPA and DMR data also were segregated for all three approaches into one group of ferrous plants and another group of nonferrous plants. The results of these analyses were tabulated in Appendices D, E, and F of the February 15, 1985 notice, at 50 FR 6580. The Agency indicated its preference for basing treatment effectiveness concentrations on EPA data plus confirmed DMR data (Appendix D), if the Agency decided not to use the CMDB.

Limitations based on the results of this analysis for the first two groups of data (EPA plus confirmed DMR, Appendix D; and EPA data only, Appendix E) generally were similar to effluent concentrations derived from the CMDB. The notable exception was copper for which the concentrations were substantially lower than CMDB copper concentrations for ferrous plants for both data groups, and higher than CMDB for nonferrous plants based on EPA data only. Analysis of the third group of data (EPA plus all DMR data) showed relatively high treatment effectivenss concentrations for lead and zinc. The Agency indicated it would endeavor to expand the Appendix D data base by obtaining confirmation of additional DMR data. The February 1985 notice also explained that final limitations and standards might be based upon additional control technologies to reduce the levels of lead and zinc.

The Agency sent letters requesting additional supporting data and documentation to four plants with lime and settle treatment included in the third data group described above. EPA requested that each plant submit data from short-term (three days) sampling and analysis of its treatment system influent (raw) and effluent. EPA received short-term sampling data from three of the four plants. One of the four plants did not sample its wastewaters because the data requested were already available without sampling. Based upon these data and documentation, the Agency determined that DMR data for three of the four plants could be considered confirmed and used in the development of final effluent limitations and standards. Data for one of the plants could not be used due to the presence of excessive quantities of noncontact cooling water commingled with process wastewaters in the plant's treatment system. The expanded data base, including the data from these three plants, was used in establish lime and settle treatment effectiveness concentrations for the final regulations.

After detailed review of all data and documentation, other changes were made in both the EPA and the DMR data bases for lime and settle treatment. Data were deleted for plants: (1) Where pollutants of concern were present in very low concentrations and/or where no recycle (once through) was practiced and (2) where excessive quantities of noncontact cooling water were present. The reasons for the changes in the data base are presented in the record at § 22.58 and in the technical Development Document.

At proposal and in the subsequent two notices of availability, the Agency's pH requirement was a range of 7.5 to 10.0. In its review and evaluation of treatment effectiveness data, EPA observed no appreciable differences in the metals concentrations in treated effluents at pH 7.5 as compared to pH 7.0. Below pH 7.0, however, increased concentrations of metals were observed, thus confirming theoretical relationships between metals solubilities and pH. Accordingly, the final lime and settle treatment effectiveness data base includes data from plants where the pH ranged from 7.0 to 10.0. Consistent with this, the pH range used in the final regulations is 7.0 to 10.0.

The Agency analyzed the revised data base (EPA plus confirmed DMR) using the methodology described in the record for the February 15, 1985 notice, and detailed in the record at § 22.48, and as further described in the record at § 22.58. After careful review of all available raw waste and treated effluent data, the Agency has determined that raw waste treatability characteristics, as well as treated effluent concentrations and characteristics, do not vary significantly from subcategory to subcategory within the metal molding and casting category. Therefore, with the exceptions noted below, the Agency developed treated effluent concentrations for lime and settle treatment systems for all subcategories based on the combined set of all EPA and confirmed DMR data.

The long-term mean treated effluent concentration for copper, based on the combined EPA and confirmed DMR data base, is 0.065 mg/l. This concentration is consistently achieved by lime and settle treatment systems treating ferrous wastewaters. For this reason, EPA is establishing the long-term mean copper concentration for ferrous plants at 0.065 mg/l. In contrast, the one copper casting plant in the EPA and confirmed DMR data set had a long-term mean treated effluent copper concentration of 0.17 mg/l. Thus, the limited data available on the performance of well-designed and well-operated lime and settle treatment systems treating wastewaters generated by nonferrous plants indicate that nonferrous plants may not be able to achieve consistently long-term mean concentrations of 0.065mg/l. For this reason, the long-term mean copper concentration for nonferrous plants is being set at 0.17 mg/l.

The long-term mean treated effluent concentration for zinc based on the combined effluent concentration data set is 0.27 mg/l. This concentration is consistently achieved by lime and settle treatment systems at the nonferrous plants. For this reason, EPA is establishing the long-term mean zinc concentration for nonferrous plants at 0.27 mg/l. The long-term mean treated effluent zine concentration based on ferrous plant data only is 0.40 mg/l. Based on these data, the long-term mean of 0.27 mg/l may not be consistently achieved by ferrous subcategory plants. Thus, to ensure that ferrous plants employing lime and settle treatment would consistently achieve the treatment effectiveness concentrations for zinc, EPA established the long-term mean for zinc at 0.40 mg/l.

Appendix K of this preamble is a tabular summary of the long-term average, maximum monthly average, and maximum one-day treatment effectiveness concentrations for lime and settle treatment.

b. *TSS, Oil and Grease, Phenols:* The Agency determined treatment effectiveness concentrations for TSS, oil and grease, and total phenols using the same EPA and confirmed DMR data base described above. These parameters measure specific bulk properties of a wastewater matrix. However, based on available data, EPA has determined that the treatability of these parameters is not expected to vary significantly within the subcategories of the metal molding and casting category.

The long-term average treated effluent concentration of TSS for both ferrous and nonferrous plants is 9 mg/l. The long-term average concentration for ferrous plants is 10 mg/l. Based on the available data from two nonferrous plants with well-operated lime and settle treatment, the long-term average concentration for nonferrous plants is 5 mg/l. Three of the six ferrous plants in the data base have long-term average TSS concentrations of 10 mg/l, and two others have long-term averages of 13 mg/l and 20 mg/l. On the basis of these observations, EPA has determined that a long-term average concentration of 10 mg/l for TSS is more appropriate and consistently achievable by lime and settle technology for both the ferrous and nonferrous subcategories.

The long-term average treated effluent concentration of oil and grease at ferrous and nonferrous plants in the EPA and confirmed DMR data base is 5 mg/l. Five of the nine plants for which EPA and DMR oil and grease data are available and were used in developing limitations achieve the maximum one-day limitations. This includes an aluminum and zinc die casting plant which has high concentrations of emulsified oil and grease in its raw wastewaters.

The long-term average total phenols treated effluent concentration for ferrous and nonferrous plants is 0.20 mg/l based on incidental removal though lime and settle systems. Three of the five plants for which EPA and DMR phenols data were available and used in developing limitations achieve the long-term average and maximum day concentrations for total phenols. Available data indicate that many plants in this industry will be able to achieve the total phenols limitations and standards without applying chemical oxidation. In those cases where the total phenols limitations and standards cannot be met using recycle and lime and settle treatment alone, bench-scale studies conducted on metal molding and casting wastewaters show that compliance can be attained through the use of chemical oxidation.

c. *Total Toxic Organics:* The Agency is regulating TTO for 22 process

segments. Total toxic organics (TTO) in raw wastewaters is defined separately for each process segment and includes those toxic organic pollutants that were found in treatable concentrations in the process segment. The Agency analyzed data for toxic organic compounds in all process segments. As described in the March 10, 1984 notice of availability, at 49 FR 10295, and 10310–10312, Appendix G, the Agency found different groups of organic pollutants at different concentrations in raw wastewaters in each process segment, with the greatest number of pollutants and highest concentrations found in the die casting, melting furnace scrubber, and dust collection process segments.

The TTO treatment effectiveness data base consists of data from four plants; an aluminum and zinc die casting plant with a central treatment system including emulsion breaking, oil skimming, and lime and settle treatment operated on a batch basis; a ferrous plant with high rate recycle and a central lime and settle treatment system with oil skimming; an aluminum die casting plant with recycle and central treatment including oil skimming and alum and settle; and a ferrous plant with treatment including oil skimming and simple settle followed by recycle. Toxic pollutant sampling data for the two plants that did not have lime and settle were used in this analysis because they employed oil and grease removal and exhibited effective removal of toxic organic pollutants.

The treated effluent concentrations achieved by these four plants were averaged for the individual toxic organic pollutants which were found at these plants. Treatability concentrations for organic pollutants that were not detected in raw wastewaters were estimated by dividing all pollutants for which data were available into groups of pollutants with similar octanol/water partition coefficients. Organic pollutants for which sampling data were not available were assigned to one of the groups depending on their partition coefficient and were assumed to have a treatability concentration equal to the mean effluent concentration of all pollutants in the group. For some pollutants, neither sampling data nor literature values for partition coefficients were available. In such cases, estimates were calculated using a parallel method based on the compound's solubility in water. The resulting range of treated effluent concentrations for the individual toxic organic pollutants was from 0.010 mg/l to 0.078 mg/l. It is noteworthy that this range of average effluent concentrations was achieved by the die casting plants which had high raw waste concentrations of toxic organic pollutants. This demonstrates the achievability of the TTO limitations by metal molding and casting plants with high raw waste loads.

The TTO concentrations were derived by starting with the list of toxic organic pollutants in each process segment which were present above treatable concentrations. The treated effluent concentrations for each of the toxic organic pollutants were summed for each process segment to determine the long-term average total effluent (TTO) concentration for all of these organic pollutants. The variability factors determined statistically and used to calculate the maximum month and maximum one-day limitations for oil and grease also were applied to the long-term average TTO concentrations for each process segment to calculate the maximum month and maximum one-day TTO limitations. The specialized definitions sections of the regulation present a list of toxic organic pollutants which are controlled by means of the TTO parameter in each process segment where TTO is regulated. Appendix M includes a tabulation of the TTO concentrations for each of the 22 process segments.

2. Lime and Settle Plus Filtration (Option 3)

a. *Metals:* Concentrations of lead and zinc in the treated effluent from a lime and settle plus filtration treatment system are based on the long-term mean lime and settle treatment effectiveness concentrations developed from analysis of the data base (EPA plus confirmed DMR) in the metal molding and casting industry, reduced by one-third. EPA indicated, in the February 15, 1985 notice, at 40 FR 6576, and detailed in Section VII of the proposed technical Development Document, that consideration was being given to a 33 percent reduction in toxic metals based on the performance of filters in treating wastewaters from other metals industries (nonferrous metals smelting and refining and procelain enameling).

Filtration technology has been installed at 32 plants and, therefore, is demonstrated in the metal molding and casting industry. EPA has DMR data for three of these plants. However, the DMR data for these plants are not appropriate for use in developing lime and settle plus filtration treatment effectiveness concentrations. One filtration system is operated in conjunction with a biological treatment system; filtered effluent from the biological system is recycled back to the process operations. A second filtration system is employed to treat the blowdown from a recycle system employing simple settling only. The third treats the effluent from a lime and settle system treating wastewater discharged from a ferrous foundry on a once-through basis. None of these systems is identical to the model technology that describes technology Option 3—recycle, lime and settle, plus filtration. Therefore, the treatment effectiveness data were transferred from the other metals categories.

As discussed in the February 15, 1985 notice, results of an EPA pilot plant study at a ferrous plant (Tyler Pipe Industries, Inc., Tyler, TX) showed that filtration reduced the concentrations of lead and zinc by about 67 percent below that achieved by a lime and settle treatment system. These pilot data support the attainability of the metals removal characteristics of filtration as applied in other metals industries.

The metals and TSS concentrations from the lime and settle treatment system operated as part of the pilot unit were higher than those that generally characterize the effluent concentrations from lime and settle systems employed in the metal molding and casting industry. Therefore, it is quite likely that the pilot filters removed metals to a greater degree than if lower concentrations of metals and TSS, such as those expected to result from the use of well-operated lime and settle systems in the metal molding and casting category, had been treated in the pilot filtration unit. For this reason, rather than assuming that 67 percent removal of lead and zinc will occur after the application of filtration technology, the Agency has assumed that 33 percent removal of lead and zinc will occur, as has been documented in other, similar industries. The Agency has concluded that metal molding and casting wastewaters are equally amenable to filtration of lime and settle effluent because of the similarity of these wastewaters with lime and settle wastewater from porcelain enameling and nonferrous metals manufacturing. The Agency received no comments asserting that a one-third reduction was not achievable.

Further reduction of the long-term treated effluent copper concentrations below the lime and settle treatment effectiveness concentrations of 0.065 mg/l (ferrous subcategory) and 0.17 mg/l (nonferrous subcategories) using filters has not been demonstrated by data available from other industries. Therefore, the long-term treated effluent copper concentrations for ferrous and nonferrous wastewater treated by lime,

settle, and filtration is being maintained equal to the lime and settle treatment effectiveness concentrations.

b. *TSS, Oil and Grease, Phenols:* The long-term average treated effluent concentration for TSS is 2.6 mg/l. This concentration is based on data from several metals industry plants presented in Section VII of the proposed Development Document. Greater removal of TSS than metals is achieved because the concentration of TSS influent to the filters is substantially higher (10 mg/l) than the metals, and thus a greater proportion of solids remain to be removed. Also, only a small portion of the influent suspended solids are metals, the remainder being nondescript inert solids.

Some incidental removal of oil and grease and total phenols may be achieved in a filtration system. However, significant reductions in treated effluent concentrations below 5 mg/l oil and grease and 0.20 mg/l phenol are not expected. Therefore, no further reductions in oil and grease and total phenols beyond those achieved by lime and settle are being assumed for filtration.

c. *Total Toxic Organics:* As noted in the discussion of lime and settle, the mechanism for removal of toxic organic compounds is the removal of oil and grease. As noted above, the Agency does not expect further removal of oil and grease by filtration. Therefore, no further removal of toxic organic pollutants is expected through filtration.

Appendix L of this preamble is a tabular summary of the long-term average, maximum month, and maximum day treated effluent concentrations for each regulated parameter.

H. Compliance Costs

Comments on the proposed regulations asserted that compliance costs were significantly underestimated. In the March 20, 1984 notice, at 49 FR 10296, the Agency indicated that its model plant costing methodology had been reviewed and revised to reflect changes in equipment and installation costs, updated from 1978 to first quarter 1983, and changes in raw wastewater characteristics. After updates and revisions, the Agency found that costs had not changed substantially. In fact, the Agency also compared model plant costs with actual plant costs submitted to EPA. In the aggregate, EPA model plant costs were approximately 25 percent higher than the plant costs, although EPA estimates for individual plants were both higher and lower than industry data due to site specific factors. On this basis, the Agency concluded that its costs were not underestimated.

Similar comments on the March 20, 1984 notice prompted the Agency to review the costs again. We found that the costing methodology, which was derived from larger continuous flow applications such as the iron and steel industry, resulted in a substantial overestimation of costs for the very low flow rates typical of many of the model plants which represent the metal molding and casting industry. For example, a number of components which comprise the options for this industry required sizes (e.g., in gallons per minute) far below the minimum size which could be costed accurately by extrapolating costs from large continuous flow applications. The Agency also eliminated unnecessary redundancy in many individual components that were included in blowdown treatment systems. Also, the Agency revised both the designs, components, and sizes of component equipment utilized in these systems to adapt more realistically the general methodology to the low flow applications in this industry. These low flow systems have been designed to be operated on a batch basis. Similarly, the process wastewater recycle systems, also very low flow systems in many cases, were recosted to be more realistic, but remained as continuous flow systems in design to be consistent with production processes.

The Agency also evaluated the cost savings that may accrue to plants which have more than one process wastewater stream and treat these combined wastewater streams in a central facility. On the average, these cost savings (reductions) were found to be approximately 29 percent of the capital cost and 36 percent of the annual costs compared to the cost of constructing and operating separate treatment systems for each of the contributing process wastewater streams. These average cost reductions were applied to the costs of separate treatment systems in the economic impact analysis of model plants with typical process combinations.

The Agency's review of costing also included an indepth revision of the costs estimated for control technology already in place. Individual components of the various options, such as settling tanks, clarifiers, and pumping systems, reported to be in place by individual plants, were accounted for by way of specific component utilization factors. These utilization factors were determined for each of the components which comprise a given option separately for both direct and indirect dischargers, and for each employee group, process segment, and type of metal poured. In this manner, a more accurate accounting of in-place technology was completed by type, size, and discharge mode of plants in the data base.

The comments received on the February 15, 1985 notice focused more narrowly on certain aspects of the costs, such as the cost of monitoring for regulated pollutant parameters, operation and maintenance labor requirements, and segregation of noncontact waters from process wastewaters. One commenter, in reviewing the compliance costs for small plants, commented that the Agency's model plant investment costs were correct.

The Agency reviewed its costing methodology again to respond to these comments and has made a few minor changes. Operation and maintenance labor requirements and hourly wages for the small model plants were asserted to be underestimated. Upon review, the Agency determined that the commenter's assertion was partially correct, As a result, EPA increased the amount of time provided for operational labor for a few of the very small model plants. However hourly wages allowed for treatment system operators were not found to be underestimated as asserted and were not changed. In the course of this review, the Agency found that no cost allowance was provided for maintenance materials. An annual cost allowance of 2 percent of investment cost was added for maintenance materials.

A commenter asserted that unit analytical costs for a number of pollutants included in compliance monitoring costs were too low. Upon review, the Agency found that the unit cost estimate for analyzing wastewaters for certain parameters were more appropriate for charges experienced by large volume customers of analytical laboratories. Cost estimates were obtained for low volume analytical services actually charged to industrial clients by two other analytical laboratories operated by EPA contractors. These charges for the regulated pollutant parameters were added to those used previously, and new average analytical charges for each parameter were calculated and incorporated into the costs for compliance monitoring.

The Agency also has reviewed the comment that many plants would have to incur costs to segregate noncontact waters from process wastewaters in order to comply with mass-based

effluent limitations and standards. The Agency reviewed specific circumstances at twenty randomly selected plants to determine whether these plants commingle noncontact water with process wastewater and, if so, to estimate the cost of segregating these wastewaters. The Agency found that 30 percent of the plants reviewed would incur costs for retrofitting to segregate noncontact waters from process wastewaters. These costs were found to be necessary for plants in the magnesium subcategory because noncontact waters were not commingled with process wastewaters. Cost estimates were developed for repiping noncontact waters separate from process wastewaters and rerouting them around process wastewater treatment systems. The average costs for these plants were added as percentages to the total required investment cost for each technology option for all model plants. However, because only 30 percent of the plants were found to need to segregate noncontact cooling waters, only 30 percent of these costs were added to the total cost of compliance for each subcategory, except magnesium where no additional costs were added. Similarly, only a portion of any economic impacts were considered to be attributable to the incremental costs for stream segregation. Projected impacts have been adjusted to account for the fact that 30 percent of the plants may incur the costs of stream segregation. Additional details on these changes are presented in the technical and economic Development Documents and in the record for this rulemaking.

As discussed in the Economic Analysis section of this preamble, model plant production data based on data submitted by plants in the industry in Data Collection Portfolios (DCPs) have been adjusted to reflect the reduced demand for castings. The model plant revenue projections used in the economic analysis have been similarly reduced. Compliance costs for model plants also have been adjusted in order to be consistent with the adjusted model plant production data. These costs were reduced by the ratio of the two production values taken to a power factor determined for each option and plant size. The power factor of that ratio was determined by plotting the total cost of each option for representative model plants in all sizes and for each process segment and metal subcategory. The result of this analysis was a group of power factors specific to each option model plant size, process segment, and subcategory. These power factors reflect changes in the relationship of cost to model plant treatment system design and capacity.

I. Intermittent Discharge

Limitations and standards presented at proposal and in the two notices of availability assumed that discharges from metal molding and casting plants would always be on a continuous basis. Information submitted in comments and confirmed by EPA indicate that treatment is commonly done on a batch basis with discharge on an intermittent basis.

To allow this practice to continue where plants find batch treatment to be an effective control technique, the final regulations contain provisions that would allow metal molding and casting plants to discharge on an intermittent basis provided that they comply with annual average limitations or standards that are equivalent to the effluent limitations and standards applicable to continuous discharging plants. Plants are eligible for the annual average limitations and standards where wastewaters are stored for periods in excess of 24 hours to be treated on a batch basis. NPDES permits established for these "noncontinuous" discharging plants must contain concentration-based maximum day and maximum for monthly average limitations or standards that are equivalent to the mass-based limitations or standards established for continuous discharging plants.

Municipal authorities may also elect to allow noncontinuous discharge to POTWs. They may do so by establishing concentration-based pretreatment standards equivalent to the mass-based standards provided in §§ 464.15, 464.16, 464.25, 464.26, 464.35, 464.36, 464.45, and 464.46 of the regulations. Equivalent concentration standards may be established by multiplying the mass standards included in the regulations by an appropriate measurement of average production, raw material usage, or air flow (kkg of metal poured, kkg of sand reclaimed, or standard cubic meters of air scrubbed) and dividing by an appropriate measure of average discharge flow of the POTW, taking into account the proper conversion factors to ensure that the units (mg/l) are correct.

J. Economic Analysis

The economic analysis performed during the development of the final regulations for the metal molding and casting category differs in four respects from the analysis performed during the development of the proposed regulations. First, EPA is basing metal molding and casting sales estimates on production data reported in the DCPs instead of the Census sales data used at proposal. Both the sales and cost estimates used in the analysis, which reflect economic conditions reported by the industry in 1978, were adjusted to account for the downturn experienced by the industry in 1981–1982, from which the industry has only partially recovered. The Agency has adopted DCP-based sales estimates as the basis for the economic analysis for the following reasons: (1) The source and accuracy of the DCP production data is known to EPA, whereas the accuracy and reporting methods used for the Census production data are not as certain, and (2) EPA bases its estimates of the costs of the various technology options considered for the final regulations on DCP production data; therefore, the revenue and cost information now have a common source. In summary, the use of the DCP data as the basis for sales makes the impact analysis consistent with the costing methodology and all other technical analysis.

Second, EPA adjusted its sales estimates derived from the DCP production data by the percent declines in shipments experienced in each of the subcategories between 1978 and 1982 (1983 for ferrous subcategory plants casting primarily steel). EPA made this adjustment in order to assure that the economic analysis was representative of long-run industry production, sales, and financial performance. The adjusted revenue estimates used in the analysis are more consistent with the revenue estimates reported in other sources, notably Census. Although 1983 and 1984 data indicate that the industry in recovering from the 1982 levels, the recovery is uneven across subcategories; 1984 shipments ranged from 46 percent (malleable iron segment of the ferrous subcategory) to 87 percent (ductile iron segment of the ferrous subcategory) of 1978 shipments.

Third, at proposal, EPA assumed that economic conditions at promulgation would be similar to economic conditions in 1984, and based its analysis on the financial capabilities of the metal molding and casting industry on data for that year. For the final economic analysis, EPA has used financial data from the entire period between 1975 and 1984 to develop the financial basis for measuring compliance impacts. EPA believes that this information depicts a more accurate representation of the long-term economic viability of the metal molding and casting industry than is shown by data for a single year.

Fourth, EPA has developed the final economic impact analysis using the

FINSTAT data base as the source of financial data for the industry. FINSTAT data are derived from the same Dun & Bradstreet data used at proposal; however, the FINSTAT data are more reliable since the data base has undergone rigorous verification; we consider these data to be more accurate than the unedited Dun & Bradstreet data. For example, interim balance sheet statements have been removed from the FINSTAT data base because interim statements are thought to be less reliable than annual balance sheet statements. A complete discussion of the FINSTAT data base is included in the economic impact analysis supporting this regulation.

VI. Control and Treatment Options and Technology Basis for the Final Regulation

A. Technology Basis for the Final Regulation

A brief summary of the technology basis for the final regulation is presented below. A more detailed discussion is presented in the final technical Development Document.

1. BPT

EPA is promulgating BPT mass-based effluent limitations for all metal subcategories except magnesium. These limitations are based on recycle of process wastewater and treatment of recycle system blowdown by oil skimming and lime precipitation and settling ("lime and settle"). Treatment for some process segments also includes oil emulsion breaking to remove emulsified lubricant oils and chemical addition (potassium permanganate) to oxidize phenolic and other organic compounds.

Production normalized applied flow rates, recycle rates, and blowdown flow rates have been discussed previously in this preamble and a summary tabulation of these rates is presented in Appendix J. The applied flow rates used to calculate the blowdown flow rates and the mass-based limitations are generally the median production normalized flows for each process segment. For more detail, see the technical Development Document. Treatment effectiveness concentrations for lime and settle also were discussed previously in this preamble and a summary tabulation of these concentrations is presented in Appendix K.

The pollutants selected for limitation at BPT are pH, suspended solids (TSS), oil and grease, copper, lead, zinc, and total phenols (4AAP). Total phenols are limited for ten process segments. These are the same pollutants EPA selected for regulation in the proposal and the two notices of availability.

The Agency projects that there are about 300 direct dischargers in the metal molding and casting industry which will be affected by this regulation. The total required investment cost (beyond equipment in place) for these plants (in 1985 dollars) is $39.7 million and the total annualized costs would be $17.4 million. The economic impact analysis indicates that three small gray iron plants in the ferrous subcategory potentially may close, with a loss of 81 jobs.

One of two direct dischargers in the magnesium subcategory is projected to close. For this reason, the Agency is excluding magnesium plants from national BPT regulations. Permitting authorities will develop permit conditions for these plants on a case-by-case basis.

Total removal of toxic pollutants from raw wastewaters would be about 2,950,000 kg/yr (6,480,000 lbs/yr). In addition, compliance with BPT will result in the removal of about 113 million kg/yr (249 million lbs/yr) of total (conventional, nonconventional, and toxic) pollutants from raw wastewaters. The Agency has determined that the effluent reduction benefits associated with compliance with BPT limitations justify the costs for all regulated subcategories. A presentation of the basis for the BPT effluent limitations for each process segment follows below.

a. *Aluminum Subcategory:* (1) *Casting Cleaning Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 480 gallons per ton of metal poured. The recycle rate established for this process segment is 95 percent. Therefore, the blowdown discharge flow of 24 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in Section 464.12(a) of the regulations.

(2) *Casting Quench Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 145 gallons per ton of metal poured. The recycle rate established for this process segment is 98 percent. Therefore, the blowdown discharge flow of 2.9 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in Section 464.12(b) of the regulations.

(3) *Die Casting Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 41.4 gallons per ton of metal poured. The recycle rate established for this process segment is 95 percent. Therefore, the blowdown discharge flow of 2.07 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is treatment of the entire process wastewater flow in a lime and settle system which includes chemical oxidation by potassium permanganate, emulsion breaking, oil skimming, lime and polymer addition, and settling followed by recycle. Chemical addition is also included to maintain recycle. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.12(c) of the regulations.

(4) *Dust Collection Scrubber Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 1.78 gallons per 1000 standard cubic feet of scrubber air flow. The recycle rate established for this process segment is 98 percent. Therefore, the blowdown discharge flow of 0.036 gallons per 1000 standard cubic feet of scrubber air flow serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes chemical oxidation by potassium permanganate, oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.12(d) of the regulations.

(5) *Grinding Scrubber Process Segment.* The BPT effluent limitations

are based upon no discharge of process wastewater pollutants. The model control technology basis for this requirement is process wastewater settling in a drag tank followed by complete recycle, with chemical addition to maintain recycle. The BPT effluent limitation is presented in § 464.12(e) of the regulations.

(6) *Investment Casting Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 17,600 gallons per ton of metal poured. The recycle rate established for this process segment is 85 percent. Therefore, the blowdown discharge flow of 2,640 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.12(f) of the regulations.

(7) *Melting Furnace Scrubber Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 11.7 gallons per 1000 standard cubic feet of scrubber air flow. The recycle rate established for this process segment is 96 percent. Therefore, the blowdown discharge flow of 0.468 gallons per 1000 standard cubic feet of scrubber air flow serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes chemical oxidation by potassium permanganate, oil skimming, lime and polymer addition, and setting. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.12(g) of the regulations.

(8) *Mold Cooling Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 1,850 gallons per ton of metal poured. The recycle rate established for this process segment is 95 percent. Therefore, the blowdown discharge flow of 92.5 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which include oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.12(h) of the regulations.

b. *Copper Subcategory:* (1) *Casting Quench Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 478 gallons per ton of metal poured. The recycle rate established for this process segment is 98 percent. Therefore, the blowdown discharge flow of 9.56 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.22(a) of the regulations.

(2) *Direct Chill Casting Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 5,780 gallons per ton of metal poured. The recycle rate established for this process segment is 95 percent. Therefore, the blowdown discharge flow of 289 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is settling (drag tank) followed by recycle, with chemical addition to maintain recycle, recycle over cooling towers, and blowdown treatment in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.22(b) of the regulations.

(3) *Dust Collection Scrubber Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 4.29 gallons per 1000 standard cubic feet of scrubber air flow. The recycle rate established for this process segment is 98 percent. Therefore, the blowdown discharge flow of 0.086 gallons/1000 standard cubic feet of scrubber air flow serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes chemical oxidation by potassium permanganate, oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.22(c) of the regulations.

(4) *Grinding Scrubber Process Segment.* The BPT effluent limitations are based upon no discharge of process wastewater pollutants. The model control technology basis for this requirement is process wastewater settling in a drag tank followed by complete recycle, with chemical addition to maintain recycle. The BPT effluent limitation is presented in §464.22(d) of the regulations.

(5) *Investment Casting Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 17,600 gallons per ton of metal poured. The recycle rate established for this process segment is 85 percent. Therefore, the blowdown discharge flow of 2,640 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.22(e) of the regulations.

(6) *Melting Furnace Scrubber Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 7.04 gallons per 1000 standard cubic feet of scrubber air flow. The recycle rate established for this process segment is 96 percent. Therefore, the blowdown discharge flow of 0.282 gallons per 1000 standard cubic feet of scrubber air flow serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle.

The blowdown from the recycle system is treated in a lime and settle system which includes chemical oxidation by potassium permanganate, oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Applendix K of this preamble. The resulting mass effluent limitations are presented in § 464.22(f) of the regulations.

(7) *Mold Cooling Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 2,450 gallons per ton of metal poured. The recycle rate established for this process segment is 95 percent. Therefore, the blowdown discharge flow of 122 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.22(g) of the regulations.

c. *Ferrous Subcategory:* (1) *Casting Cleaning Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 213 gallons per ton of metal poured. The recycle rate established for this process segment is 95 percent. Therefore, the blowdown discharge flow of 10.7 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.32(a) of the regulations.

(2) *Casting Quench Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 571 gallons per ton of metal poured. The recycle rate established for this process segment is 98 percent. Therefore, the blowdown discharge flow of 11.4 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.32(b) of the regulations.

(3) *Dust Collection Scrubber Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 3.0 gallons per 1000 standard cubic feet of scrubber air flow. The recycle rate established for this process segment is 97 percent. Therefore, the blowdown discharge flow of 0.09 gallons per 1000 standard cubic feet of scrubber air flow serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes chemical oxidation by potassium permanganate, oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.32(c) of the regulations.

(4) *Grinding Scrubber Process Segment.* The BPT effluent limitations are based upon no discharge of process wastewater pollutants. The model control technology basis for this requirement is process wastewater settling in a drag tank followed by complete recycle, with chemical addition to maintain recycle. The BPT effluent limitation is presented in § 464.32(d) of the regulations.

(5) *Investment Casting Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 17,600 gallons per ton of metal poured. The recycle rate established for this process segment is 85 percent. Therefore, the blowdown discharge flow of 2,640 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.32(e) of the regulations.

(6) *Melting Furnace Scrubber Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 10.5 gallons per 1000 standard cubic feet of scrubber air flow. The recycle rate established for this process segment is 96 percent. Therefore, the blowdown discharge flow of 0.42 gallons per 1000 standard cubic feet of scrubber air flow serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes chemical oxidation by potassium permanganate, oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.32(f) of the regulations.

(7) *Mold Cooling Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 707 gallons per ton of metal poured. The recycle rate established for this process segment is 95 percent. Therefore, the blowdown discharge flow of 35.4 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.32(g) of the regulations.

(8) *Slag Quench Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 727 gallons per ton of metal poured. The recycle rate established for this process segment is 94 percent. Therefore, the blowdown discharge flow of 43.6 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle.

The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.32(h) of the regulations.

(9) *Wet Sand Reclamation Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 895 gallons per ton of sand reclaimed. The recycle rate established for this process segment is 80 percent. Therefore, the blowdown discharge flow of 179 gallons per ton of sand reclaimed serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a clarifier followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes chemical oxidation by potassium permanganate, oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.32(i) of the regulations.

d. *Zinc Subcategory:* (1) *Casting Quench Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 533 gallons per ton of metal poured. The recycle rate established for this process segment is 98 percent. Therefore, the blowdown discharge flow of 10.7 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.42(a) of the regulations.

(2) *Die Casting Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 41.4 gallons per ton of metal poured. The recycle rate established for this process segment is 95 percent. Therefore, the blowdown discharge flow of 2.07 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is treatment of the entire process wastewater flow in a lime and settle system which includes chemical oxidation by potassium permanganate, emulsion breaking, oil skimming, lime and polymer addition, and settling followed by recycle, with chemical addition to maintain recycle. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.42(b) of the regulations.

(3) *Melting Furnace Scrubber Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 6.07 gallons per 1000 standard cubic feet of scrubber air flow. The recycle rate established for this process segment is 96 percent. Therefore, the blowdown discharge flow of 0.243 gallons per 1000 standard cubic feet of blowdown scrubber air flow serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes chemical oxidation by potassium permanganate, oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.42(c) of the regulations.

(4) *Mold Cooling Process Segment.* The BPT effluent limitations are derived from a production normalized applied flow of 1,890 gallons per ton of metal poured. The recycle rate established for this process segment is 95 percent. Therefore, the blowdown discharge flow of 94.5 gallons per ton of metal poured serves as the flow basis for the mass effluent limitations. The model control technology is process water settling in a drag tank followed by recycle, with chemical addition to maintain recycle. The blowdown from the recycle system is treated in a lime and settle system which includes oil skimming, lime and polymer addition, and settling. The treatment effectiveness concentrations for lime and settle are presented in Appendix K of this preamble. The resulting mass effluent limitations are presented in § 464.42(d) of the regulations.

2. BAT

EPA is promulgating BAT mass-based effluent limitations for all metal subcategories except magnesium. For the magnesium subcategory, the Agency has determined that compliance with BAT effluent limitations based on the treatment technologies identified in this rulemaking would not be economically achievable (see also the section entitled *Costs, Effluent Reduction Benefits, and Economic Impacts*).

The Agency considered the technologies included in Options 2, 3, and 4 (see Section V of this preamble) as possible BAT model technologies. The flow rates for BAT are the same as those selected for BPT for all process segments and are presented in Appendix J. As discussed previously, EPA established the flow basis of BPT effluent limitations guidelines on the lowest flow rate it could justify with existing data in order to ensure that treatment systems would be optimized and that the BPT and BAT technology options would be totally compatible. Thus, the flow basis of BPT also represents the best available flow rates for the metal molding and casting point source category.

BAT effluent limitations for the copper and zinc subcategories and for the major portions of the ferrous subcategory (all plants except those that cast steel and small plants that cast malleable iron), are based on recycle, lime and settle, plus filtration. As discussed previous, filtration technology is demonstrated in the metal molding and casting industry. The treatment effectiveness concentrations for recycle, lime and settle, plus filtration are presented in Appendix L. Compliance with the effluent limitations based on filtration is economically achievable and results in significant reductions in the discharge of toxic metal pollutants.

BAT effluent limitations for the smallest plants in the ferrous subcategory which cast primarily malleable iron and pour less than 3,557 tons of metal per year are based on recycle, lime and settle. The Agency's economic impact analysis determined that the cost of complying with effluent limitations based on filtration potentially may cause closure of one of three malleable iron plants in this size group. Therefore, EPA determined that the addition of filtration would not be economically achievable for this subcategory segment. Accordingly, the Agency is not basing BAT effluent limitations on recycle, lime and settle, and filtration for the smallest malleable iron plants.

The BAT effluent limitations are based on the same control and treatment technologies (recycle, lime and settle) as BPT for all plants in the aluminum subcategory and for those

plants in the ferrous subcategory that cast primarily steel. The treatment effectiveness concentrations for recycle, lime and settle are presented in Appendix K.

For the aluminum subcategory, EPA estimates that filtration would remove an additional 0.003 kg per plant per day (0.007) lb per plant per day) of toxic metals. Aluminum subcategory wastewater discharges are comprised primarily of zinc, nickel, and copper. This contrasts with the zinc subcategory where a substantial portion of the total toxic metals discharged is lead, which is highly toxic, and the copper subcategory where treatable levels of cadmium, an extremely toxic metal, remain after the application of lime and settle treatment. The incremental costs of the effluent reductions that filtration would achieve are $0.31 million in investment costs and $0.26 million in total annualized costs. The Agency has concluded that, in light of all these factors, filtration should not be the technology basis for BAT effluent limitations for the aluminum subcategory.

For the steel segment of the ferrous subcategory, EPA estimates that filtration would remove an additional 0.036 kg per plant per day (0.08 lb per plant per day) of toxic metals. These removals would consist mainly of zinc and nickel. The incremental costs of these incremental effluent reductions would be $0.48 million in investment costs and $0.29 million in total annualized costs. The Agency has concluded that, in light of all these factors, filtration should not be the technology basis for BAT effluent limitations for plants in the ferrous subcategory that cast primarily steel.

The pollutants selected for regulation at BAT are copper, lead, zinc, and total phenols. Total phenols (4AAP) are regulated at the BPT level in those 10 process segments where treatable levels of phenolic compounds are found in the raw waste discharge. These pollutants are among the same pollutants selected for regulation at BAT in the proposal and the two notices of availability. Total Toxic Organics (TTO) are not regulated at BAT because compliance with the BPT effluent limitations for total phenols and oil and grease provides effective removal of toxic organic compounds. No appreciable incremental removals of TTO or total phenols are expected due to the application of filtration.

Implementation of the BAT effluent limitations will represent reasonable further progress in reducing the discharge of pollutants and will remove an additional 3,230 kg/yr (7,100 lb/yr) of toxic metals beyond BPT, at a total incremental investment cost (beyond equipment in-place) of $3.9 million and an incremental total annual cost of $2.3 million (1985 dollars).

3. NSPS

EPA is promulgating NSPS for all regulated subcategories based on the same technology as for BAT for the reasons explained in the BAT section. The blowdown discharge flow allowances for NSPS are the same as for BAT and are summarized in Appendix J of this preamble. Treatment effectiveness concentrations are present in Appendix K and Appendix L.

New sources in the magnesium subcategory are not regulated by NSPS because the costs of compliance with standards based on the treatment technologies identified in this rulemaking, which would have resulted in closure for one of two existing sources, are likely to serve as barriers to entry into magnesium casting. The regulations do not present entry barriers for the remaining subcategories.

The pollutants regulated by NSPS are the pollutants regulated by BPT and BAT effluent limitations: pH, TSS, oil and grease, total phenol (4AAP) for ten process segments, copper, lead, and zinc. Toxic organic pollutants are not regulated because compliance with the oil and grease limitation will provide effective removal.

4. PSES

Pursuant to section 307 of the Clean Water Act, EPA must establish pretreatment standards for pollutants which pass through or interfere with POTWs. The Agency has compared the removals of toxic metal and toxic organic pollutants which occur in POTWs with the removals of these toxic pollutants by direct dischargers in the metal molding and casting industry applying the best available technology economically achievable. A well-operated POTW with secondary treatment will remove about 58 percent of the copper, 48 percent of the lead, 65 percent of the zinc, 89 percent of the total phenols (4AAP), and 80 percent of the Total Toxic Organics (TTO). The average removal of these pollutants at BAT for each of the regulated subcategories was greater than the POTW removals. Accordingly, the Agency has concluded that these pollutants pass through POTWs and thus must be regulated by PSES.

EPA is promulgating PSES based on the application of technology equivalent to BAT. With the following exceptions, PSES are based on the application of high rate recycle with lime and settle treatment plus filtration. As for BAT, EPA has based PSES on recycle, lime and settle for all plants with indirect discharge in the aluminum subcategory, the ferrous subcategory where steel is the primary metal cast, and for the relatively small plants in the ferrous subcategory which cast primarily malleable iron. As for BAT, EPA is not establishing PSES for plants in the magnesium subcategory because the economic impact analysis indicates that the regulation is not economically achievable for the magnesium subcategory. Plants in the magnesium subcategory are subject to the General Pretreatment Regulations (40 CFR Part 403). Finally, the Agency's economic impact analysis indicates that for small plants in the ferrous subcategory which cast primarily gray iron and pour less than 1,784 tons of metal per year, the cost of complying with pretreatment standards based on recycle, lime and settle, and filtration is not economically achievable. Therefore, PSES for these small gray iron plants is based on recycle, lime and settle.

PSES are mass-based with the same production normalized discharge flow (blowdown) allowances as established for BAT and BPT. Flow reduction by process wastewater recycle technology is applicable to and demonstrated by both direct and indirect dischargers. To assure that indirect dischargers achieve the effluent reduction benefits of the regulation, EPA has elected to establish mass-based PSES. See the discussion of applied flow rates, recycle rates, and blowdown flow rates in a previous section of this preamble. Appendix J of this preamble presents a tabular summary of all applied flow rates, recycle rates, and blowdown flow rates for each process segment. Treatment effectiveness also is discussed in a preceding section of this preamble, and summarized in Appendix K (recycle, lime and settle) and Appendix L (recycle, lime and settle, and filtration).

As discussed in the March 20, 1984 notice of availability, at 49 FR 10295, the final regulations include standards for Total Toxic Organics (TTO). TTO include all toxic organic compounds found at treatable concentrations in raw wastewaters from these process segments. At that time, the Agency indicated that TTO would be controlled for 14 process segments including the melting furnace scrubber processes in the aluminum, copper, ferrous, and zinc subcategories; the casting quench processes in the aluminum, ferrous, and zinc subcategories; the die casting processes in the aluminum and zinc subcategories; the dust collection scrubber processes in the aluminum, copper, and ferrous subcategories; and

the slag quench and wet sand reclamation processes in the ferrous subcategory. After reviewing all available data and recalculating the raw waste loads characteristic of each production process, the Agency has determined that treatable levels of TTO occur in an additional eight process segments. Accordingly, EPA is establishing PSES controlling TTO discharges from the 22 process segments where TTO are found above treatable levels in the raw waste discharges. Sections 464.11, 464.21, 464.31, and 464.41 of the regulation present lists of those toxic organics included in the TTO pretreatment standards for each process segment. The basis for the TTO treated effluent concentrations for these 22 process segments was presented in a preceding section of this preamble. The treatment effectiveness concentrations used in developing the mass-based pretreatment standards are presented in Appendix M.

The analysis of wastewaters for toxic organics is costly and requires sophisticated equipment. Therefore, the Agency has included in the final regulations an alternate monitoring parameter for TTO. Data indicate that the toxic organics are more soluble in oil and grease than in water, and that removal of oil and grease will remove substantially the toxic organics. The TTO standard is based on the application of oil and grease removal technology. If oil and grease is controlled at the regulated level, compliance with the TTO pretreatment standard is ensured.

The pollutants selected for regulation are copper, lead, and zinc for all process segments, total phenol (4AAP) for ten process segments, and TTO for 22 process segments. Removal allowances pursuant to 40 CFR 403.7(a) may be granted for TTO, but not for oil and grease.

In 1986, EPA projects that there will be about 500 plants with indirect discharge. Implementation of PSES will remove a total of 2,860,000 kg/yr (6,299,000 lbs/yr) of toxic metal and toxic organic pollutants, at a total required investment cost (beyond equipment in place) of $46.7 million, and a total annualized cost of $21.5 million (1985 dollars). The PSES requirements are projected to result in three plant closures—two in the gray iron segment of the ferrous subcategory and one in the ductile iron segment of the ferrous subcategory. The Agency has concluded that the PSES are economically achievable for the metal molding and casting point source category.

The Agency has considered the time for compliance with PSES. Few of the plants in this industry with indirect discharge have installed and are operating properly the technology necessary for complying with PSES. Many plants in this and other industries will be procuring engineering services and installing treatment equipment utilized as model technologies for these regulations. This may result in delays in engineering design, equipment ordering and delivery, installation, start-up, and operating these systems. For these reasons, the Agency has decided to establish the PSES compliance date for all facilities at three years from the date of promulgation.

5. PSNS

As discussed for PSES, EPA has determined that toxic metal and organic pollutants will pass through POTWs without adequate pretreatment and, therefore, pretreatment standards for new source indirect dischargers (PSNS) are required. PSNS for all subcategories are the same as PSES.

New sources in the magnesium subcategory are not regulated by PSNS because the costs of compliance with standards based on the technologies considered in this rulemaking, which would have resulted in closure for one of two existing sources, are likely to serve as barriers to entry into magnesium casting. New source indirect discharging plants in the magnesium subcategory are subject to the General Pretreatment Regulations (40 CFR Part 403). The Agency has concluded that PSNS will not serve as barriers to entry of new plants into the remaining subcategories of the metal molding and casting industry.

The pollutants regulated by PSNS are total phenol (4AAP) for ten process segments, TTO for 22 process segments, copper, lead, and zinc. Oil and grease is an alternate monitoring parameter for TTO. Removal allowances pursuant to 40 CFR 403.7(a) may be granted for TTO, but not for oil and grease.

VII. Pollutants Excluded From Regulation

The Settlement Agreement in *NRDC* v. *Train, supra* contains provisions authorizing the exclusion from regulation in certain instances of toxic pollutants and industry subcategories. These provisions have been rewritten in a Revised Settlement Agreement that was approved by the District Court for the District of Columbia on March 9, 1979. See *NRDC* v. *Costle,* 12 ERC 1833 (D.D.C. 1979).

The Agency has deleted the following three pollutants from the toxic pollutant list: (49) trichlorofluoromethane and (50) dichlorofluoromethane (46 FR 79692; January 8, 1981) and (17) bis(chloromethyl)ether (46 FR 10723; February 4, 1981).

Paragraph 8(a)(i) of the Settlement Agreement allows the Administrator to exclude from regulation pollutants where equal or more stringent protection is already provided by effluent limitations guidelines, new source performance standards, or pretreatment standards promulgated pursuant to sections 301, 304, 306, 307(a), 307(b), or 307(c) of the Act. Paragraph 8(a)(iii) of the Settlement Agreement allows the Administrator to exclude from regulation toxic pollutants not detectable by section 304(h) analytical methods or other state-of-the-art methods. Paragraph 8(a)(iii) also allows the Administrator to exclude from regulation toxic pollutants detectable in the effluent from only a small number of sources within the subcategory because they are uniquely related to those sources. Paragraph 8 (a)(iii) allows the Administrator to exclude from regulation toxic pollutants present in amounts too small to be effectively reduced by technologies known to the Administrator.

Forty of the priority pollutants are being excluded from regulation across all subcategories because they were not detected at or above the nominal limits of quantification by state-of-the-art analytical methods at any of the plants sampled by the Agency. Appendix C contains a list of these toxic pollutants.

The presence and absence of the remaining priority pollutants in metal molding and casting wastewaters varies by subcategory. Therefore, further pollutant exclusions are presented for each subcategory in Appendices D through G. Each appendix includes a subtitle which presents the reason for exclusion of the list of priority pollutants that follows.

VIII. Economic Considerations

A. Introduction

The Agency's economic impact assessment of this regulation is presented in the report entitled *Economic Impact Analysis of Effluent Limitations Guidelines and Standards for the Metal Molding and Casting Industry* (U.S. EPA, Washington, DC, September 1985). This report details the investment and annualized costs of compliance with this regulation for the metal molding and casting industry. The compliance costs are based on engineering estimates of capital and operating and maintenance costs for the effluent control systems described earlier in this preamble and in detail in

Section VIII of the technical Development Document. The economic impact analysis assesses the impact of these effluent control costs on the metal molding and casting industry in terms of price changes, production cost changes, plant closures, employment effects, and balance of trade effects. The economic impact analysis reflects revisions in estimates of treatment costs that have occurred since proposal as discussed in Section VIII of the technical Development Document.

In addition, EPA has conducted an analysis of the incremental removal cost per pound equivalent for each of the technology options. A pound equivalent is calculated by multiplying the number of pounds of a toxic pollutant discharged by a weighting factor for that pollutant. The weighting factor is equal to the water quality criterion for a standard pollutant (copper), divided by the water quality criterion for the pollutant being evaluated. The use of "pound equivalent" gives relatively more weight to removal of more toxic pollutants. Thus, for a given expenditure, the cost per pound equivalent removed would be lower when a highly toxic pollutant is removed than if a less toxic pollutant is removed. This analysis is included in the record of this rulemaking.

B. Costs and Economic Impacts

The Agency projects that 3,853 foundries will be in operation in 1986. An estimated 2,794 of these will be dry foundries using no process waters in their manufacturing operations and 259 foundries will discharge no effluent to surface waters. The Agency estimates that 796 foundries will incur costs due to this regulation. We project that 299 of these facilities will discharge their wastewater directly into navigable waters, and 497 will discharge into publicly owned treatment works (POTWs).

Total capital costs for the discharging plants as a result of this regulation are estimated to be $90.4 million; while total annualized costs, including depreciation and interest, are estimated to be $41.2 million. These costs are expressed in 1985 dollars.

Three gray iron facilities are expected to close as a result of the BPT level of control with an accompanying employment loss of 81 jobs. Two additional gray iron facilities are expected to close due to the PSES level of control resulting in an employment loss of 54 jobs. The only other closure projected is in the ductile iron segment of the ferrous casting subcategory and will result from implementation of the PSES limitations. The job loss associated with this one closure is projected to be 27 employees.

Magnesium foundries are exempted from this regulation because the Agency determined that the effluent limitations and standards that would result from the application of the technology options considered as the basis for this regulation are not economically achievable for existing plants in the subcategory and the options of compliance with such costs would present a barrier to entry to new plants. Two of the four affected magnesium foundries were projected to close under the BPT/BAT limitations and PSES. All of the magnesium foundries that would have been covered by the regulation are small businesses employing 50 or fewer persons.

No further significant impacts are projected as a result of the regulation. Increases in the cost of production generally average less than one percent, although small gray iron and ductile iron foundries may experience cost increases as high as 4.0 and 2.5 percent, respectively. Foundries are not assumed to be able to pass on these cost increases in the form of higher prices due to competition from the 3053 foundries not incurring costs due to the regulation (the dry foundries and zero discharges). No incremental trade impacts are expected to occur from this regulation.

For purposes of the economic analysis, the Agency created eight separate economic subcategories based on metal types: four ferrous subcategories—gray iron, ductile iron, malleable iron, steel; and four nonferrous subcategories—aluminum, zinc, copper, and magnesium. Use of these subcategories (which correspond to SIC codes) recognizes that most foundries derive their sales from castings of one or primarily from one metal type and that the products derived from these metals have different properties, applications, and values. Therefore, this subcategorization enabled the Agency to develop an economic analysis sensitive to different financial profiles based on product type.

Each metal subcategory was further divided into employment size groups. The employment size groups were fewer than 10, 10 to 49, 50 to 99, 100 to 249, and 250 or more. Employment size groupings were used as a proxy for production levels because data necessary for the analysis were reported in this manner by industry in the major trade journal. Model plant financial profiles representing affected foundries in each economic employment subcategory were then developed to estimate the income that could be generated by foundries and used (in part) to pay for pollution control equipment. These income estimates were used to determine whether the costs of compliance with the regulation would cause significant economic impacts.

The financial profiles developed represented the balance sheets and income statements for a "typical" foundry in each employment size segment and metal type. These profiles were developed exclusively from job shop financial data, which represent the most complete picture of job shop or "stand-alone" operations available. For the purpose of the analysis, captive operations (i.e., those selling 50 percent or more of their output to a parent company) were assumed to have the same financial characteristics as job shop operations. This approach may overstate impacts because it assumes that captives are treated the same as jobbers by their parent companies, thereby ignoring potential benefits of ownership by a larger corporation such as an assured product market, access to professional management techniques, and easier access to credit markets. Compliance cost estimates were based on the costs of additional treatment required to meet the effluent limitations and standards. If compliance costs exceeded the plant's ability to generate capital and income at a specific level, a closure was predicted. Determination of a plant's ability to pay for the treatment costs was based on three closures tests: Debt to total assets; return on total assets and cash flow to total debt. Failure of two of these three tests signaled a closure. Total plant closures were then extrapolated from the model plant results to the estimated population of foundries in 1986.

The Agency revised some of its earlier economic methodology as detailed in this preamble under the "Changes Since Proposal" section. Briefly, these changes entailed using multi-year data for the analysis, using the FINSTAT data base for development of the financial profiles; using sales revenues which were derived from data collection portfolio (DCP) information, and adjusting the DCP-based production to account for economic trends in the industry. Other changes since proposal are discussed in the March 1984 Notice of Availability.

Following are summaries of the costs and impacts under the promulgated limitations and standards.

BPT: BPT regulations are being promulgated for direct dischargers in all economic subcategories except for magnesium. By 1986, the Agency projects that 297 direct dischargers will have to install and operate additional

equipment to comply with the BPT limitations. Investment costs for BPT are $39.7 million; total annual costs are $17.4 million, including interest and depreciation (1985 dollars). As a result of compliance with this regulation, three gray iron facilities out of 91 direct discharging gray iron plants are expected to close, resulting in an employment loss of 81 jobs. Increases in the cost of production at the affected plants will generally be less than one percent. No balance of trade effects are expected.

BAT: BAT regulations are also being promulgated for all the economic subcategories except for magnesium. However, incremental costs to comply with BAT will arise in the gray iron, ductile iron, malleable iron, zinc, and copper subcategories. BAT limitations for steel, zinc and aluminum foundries are based on the BPT technology; therefore, no incremental compliance costs will result. The incremental investment costs due to BAT total $3.9 million while annualized costs total $2.3 million (1985 dollars). The incremental increase in the cost of production associated with the BAT technology is less than one percent in all affected economic subcategories. BAT for malleable iron in foundries with production levels associated with the less than 99 employment size (i.e., 3,557 tons/year of metal poured) is also equal to BPT. One of the three foundries in this employment size grouping was projected to close; thus, regulations based on lime, settle, and filtration were considered to be not economically achievable for this subgroup. Therefore, a less stringent control level is being promulgated for lower production levels in the malleable iron subcategory segment. Malleable iron foundries with greater production levels must comply with the more stringent limitations based on the BAT technology of recycle, lime, settle, and filtration.

PSES: Categorical pretreatment standards are being promulgated for indirect dischargers in all economic subcategories except magnesium. By 1986, the Agency projects that there will be 497 indirect dischargers that will have to install and operate additional equipment to comply with the PSES limitations. The Agency estimates that capital costs to comply with PSES are $46.7 million and annualized costs are $21.5 million (1985 dollars). Two plant closures in the gray iron subcategory segment are projected. The accompanying employment loss is expected to be 54 jobs. The model technology for PSES is the same as those for BAT except for small gray iron foundries. Six foundries representing approximately fifteen percent of gray iron indirect discharging foundries in the less than 50 employment size grouping would be expected to close if the model technologies for PSES were recycle, lime, settle, and filtration. Thus, EPA determined that standards based on lime, settle, and filter were not economically achievable for this group of plants. Therefore, the technology and costs for plants which pour less than 1,784 tons of metal per year reflect the less stringent level of recycle, lime, and settle. Closure estimates were reduced from six to two gray iron foundries at this less stringent level of control. One additional plant closure is projected in the ductile iron segment of the ferrous subcategory, resulting in an employment loss of 27 jobs. Production cost increases average less than one percent overall under PSES.

NSPS/PSNS: The new source standards (NSPS and PSNS) are based on the same level of technology as BAT and PSES, respectively. Therefore, there are no incremental costs and there are no barriers to entry attributable to the new source standards.

C. Regulatory Flexibility Analysis

Public Law 96-354 requires that EPA prepare a Regulatory Flexibility Anaylsis for regulations that have a significant impact on a substantial number of small entities. A small business analysis is included in the economic impact analysis for this regulation.

If all foundries had to comply with limitations and standards based on recycle, lime, settle, and filtration, closures would total 13 and the employment loss would total 387 jobs. These closure estimates represent less than two percent of discharging foundries and less than 0.5 percent of all foundries. These impacts occur in the smaller employment size groupings of less than 100 employees. Partly in recognition of this disproportionate effect on smaller foundries, the Agency is promulgating less stringent effluent limitations guidelines and standards to mitigate these effects. (In the instance of the magnesium subcategory, the entire subcategory is being exempted from these nationally-applicable regulations.) The effluent limitations guidelines and standards being promulgated today are projected to result in only six closures and an employment loss of 162 jobs. The Agency believes that these few remaining plant closures do not result in a significant effect on a substantial number of small businesses, and I hereby certify to this effect for the purpose of 50 U.S.C. 605(b). While this conclusion obviates the need for a formal Regulatory Flexibility Anaylsis, a small business analysis has been included in the economic impact analysis report and supports the conclusion that the regulation is economically achievable for small plants.

D. SBA Loans

The Agency is continuing to encourage small plants to use Small Business Administration (SBA) financing as needed for the purchase of pollution control equipment. The three basic programs are: (1) The Pollution Control Bond Program (tax exempt), (2) the section 503 Program, and (3) the Regular Business Loan Program. Eligibility for SBA programs varies by industry. Generally, a company must be independently owned; not dominant in its field; the employee size ranges from 250 to 1,500 employees (dependent upon industry); and annual sales revenue ranges from $275,000 to $22 million (varies by industry). The estimated economic impacts for this category do not include consideration of financing available through these programs.

For further information and specifics on the Pollution Control Bond Program, contact: U.S. Small Business Administration, Office of Pollution Control Financing, 4040 North Fairfax Drive, Suite 500, Arlington, Virginia 22203, (703) 235-2920.

The section 503 Program, as amended in July 1980, allows long-term loans to small and medium sized businesses. These loans are made by SBA approved local development companies. These companies are authorized to issue Government-backed debentures that are bought by the Federal Financing Bank, an arm of the U.S. Treasury.

Through SBA's Regular Business Loan Program, loans are made available by commercial banks are guaranteed by the SBA. This program has interest rates equivalent to market rates.

For additional information on the Regular Business Loan and section 503 Programs, contact your local SBA Office. The coordinator at EPA headquarters is Ms. Frances A. Desselle who may be reached at (202) 382-5373.

E. Executive Order 12291

Executive Order 12291 requires EPA and other agencies to perform regulatory impact analyses of major regulations. Major rules are those that impose a cost on the economy of $100 million a year or more or have certain other economic impacts. This regulation is not a major rule because its annualized cost of $41.2 million is less than $100 million and it

meets none of the other criteria specified in Section 1 paragraph (b) of the Executive Order. The economic impact analysis prepared for this rulemaking meets the requirements for non-major rules.

IX. Non-Water Quality Aspects of Pollution Control

The elimination or reduction of one form of pollution may cause other environmental problems. Therefore, sections 304(b) and 306 of the Act require EPA to consider the non-water quality environmental impact (including energy requirements) of certain regulations. In compliance with these provisions, EPA has considered the effect of this regulation on air pollution, solid waste generation, water scarcity, and energy consumption. This rule was circulated to and reviewed by EPA personnel responsible for non-water quality environmental programs. While it is difficult to balance pollution problems against each other and against energy utilization, EPA is promulgating a regulation that it believes best serves often competing national goals.

The following are the non-water quality environmental impacts (including energy requirements) associated with this final regulation:

A. Air Pollution

Imposition of the BPT, BAT, NSPS, PSES, and PSNS will not create any substantial air pollution problems. Minor very localized air pollution emissions currently exist in the ferrous casting subcategory where wastewaters are used to quench the hot slag generated in the melting process. Also water vapor containing some particulate matter is released from the cooling tower systems used in the casting quench and mold cooling process segments. However, none of these conditions currently are considered significant and no significant future impacts are expected as the result of these regulations.

B. Solid Waste

EPA estimates that the BPT requirements will generate an additional 522,000 kkg (575,000 tons) per year of solid wastes (at 25 percent solids) over that which is currently being generated by the metal molding and casting category. This includes 1,730 kkg (1,900 tons) of oily wastes. EPA estimates that BAT requirements will increase these wastes by about 240 kkg (265 tons) per year beyond BPT levels. In addition, PSES will increase these wastes by approximately 442,000 kkg (486,000 tons) per year beyond current levels. New metal molding and casting plants subject to PSNS or NSPS also will generate treatment system sludges.

The Agency examined the solid wastes that would be generated by metal molding and casting processes using the model treatment technologies and has concluded that they are not hazardous under section 3001 of the Resource Conservation and Recovery Act (RCRA). This judgment is based on a review of the results of the Extraction Procedure (EP) toxicity tests that were conducted on metal molding and casting solid wastes. None of the pollutants for which the extracts in the EP test are analyzed were found in metal molding and casting sludges above the allowable concentration (i.e., the concentration that makes the waste hazardous). Metal molding and casting wastes also are not listed currently as hazardous under 40 CFR 261.11 (45 FR 33121, May 19, 1980; as amended by 45 FR 76624, November 19, 1980). Moreover, the 1984 amendments to RCRA provided specific exemptions to the double liner requirement for this industry for hazardous wastes as long as these do not contain certain constituents which would render the wastes hazardous for reasons other than the EP toxicity characteristic. Included in the exemption are waste molding sands (production waste) and wastes from melting furnace emission controls. These are among the highest volume wastes generated at metal molding and casting plants. For the above reasons, EPA has not developed estimates of the costs to dispose of hazardous solid wastes. EPA has included costs for nonhazardous waste disposal of $21.00/ton for sludges and $28.60/ton for oily wastes generated in treating metal molding and casting wastewaters.

Although it is the Agency's view that solid wastes generated as a result of these regulations are not expected to be classified as hazardous under the regulations implementing Subtitle C of RCRA, individual generators of these wastes must test the waste to determine if they meet any of the characteristics of hazardous wastes. See 40 CFR 262.11 (45 FR 12732–12733, February 26, 1980). As more information becomes available, it is possible that certain sludges could be listed as hazardous pursuant to 40 CFR 261.11.

Should any metal molding and casting wastes be identified as hazardous, they will come within the scope of RCRA's "cradle to grave" hazardous waste management program, requiring regulation from the point of generation to the point of final disposition. EPA's generator standards require generators of hazardous wastes to meet containerization, labeling, recordkeeping, and reporting requirements. If metal molders or casters dispose of hazardous wastes offsite, they would have to prepare a manifest that tracks the movement of the wastes from the generator's premises to an appropriate off-site treatment, storage, or disposal facility. See 40 CFR 262.20 (45 FR 33142, May 19, 1980; as amended at 45 FR 86973, December 31, 1980). The transporter regulations require transporters of hazardous wastes to comply with the manifest system to ensure that the wastes are delivered to a permitted facility. See 40 CFR 263.20 (45 FR 33142, May 19, 1980; as amended at 45 FR 86973, December 31, 1980). Finally, RCRA regulations establish standards for hazardous waste treatment, storage, and disposal facilities allowed to receive such wastes. See 40 CFR Parts 264 and 265 (46 FR 2802, January 12, 1981; 47 FR 32274, July 26, 1982).

Even though metal molding and casting wastes are not identified as hazardous, they still must be disposed of in a manner that will not violate the open dumping prohibition of section 4005 of RCRA. The Agency has calculated, as part of the costs for wastewater treatment, the cost for model plants of hauling and disposing of these wastes (using the unit costs noted above) in accordance with this requirement. For more details, see Section IX of the technical Development Document.

C. Consumptive Water Loss

EPA estimates that the evaporative water losses from the recycle systems that we project will be used to comply with the final regulations will be less than about 0.1 percent of the water losses that now occur from the air pollution control scrubbers used extensively throughout this industry. Therefore, compliance with this final regulation is not expected to result in a significant consumptive water loss. The Agency concludes that the benefits derived from compliance with the final regulations justify the minimal water loss associated with the application of recycle technology.

D. Energy Requirements

EPA estimates that compliance with the BPT requirements of these regulations by direct dischargers will result in a total electrical energy consumption of 18.8×10^6 kilowatt-hours per year over current energy usage for wastewater treatment. EPA estimates that compliance with the BAT requirements of these regulations by direct dischargers will result in a total

electrical energy consumption of 4.2 x 10^6 kilowatt-hours per year in addition to the energy usage to comply with BPT. Compliance with the PSES requirements of these regulations by indirect dischargers will result in a total electrical energy consumption of 17.3 x 10^6 kilowatt-hours per year over current energy usage for wastewater treatment. Industry compliance with the BPT, BAT, and PSES limitations will result in an energy increase of 0.13 percent over the 31.3 x 10^6 kilowatt-hours used in 1978 for production purposes.

The energy requirements for NSPS and PSNS are estimated to be similar to energy requirements for BAT. More accurate estimates are difficult to make because projections for new plant construction are variable. It is estimated that new plants will design, wherever possible, production techniques and air pollution control devices that either require less water than current practices or require no water such as dry air pollution control devices.

X. Best Management Practices (BMPs)

Section 304(e) of the Clean Water Act authorizes the Administrator to prescribe "best management practices" (BMP). EPA is not promulgating BMPs specific to the metal molding and casting category.

XI. Upset and Bypass Provisions

A recurring issue of concern has been whether industry guidelines should include provisions authorizing noncompliance with effluent limitations guidelines during periods of "upset" or "bypass." An upset, sometimes called an "excursion," is an unintentional noncompliance occurring for reasons beyond the reasonable control of the permittee. Industry argues that an upset provision in EPA's effluent limitations guidelines is necessary because such upsets inevitably occur even in properly operated control equipment. Because technology-based effluent limitations guidelines require only what technology can achieve, they claim that liability for such situations is improper. When confronted with this issue, courts have been divided on the question of whether an explicit upset or excursion exemption is necessary or whether upset or excursion incidents may be handled through EPA's exercise of enforcement discretion. Compare, *Marathon Oil Co.* v. *EPA*, 564 F.2d 1253 (9th Cir. 1977) with *Weyerhaeuser Co.* v. *Costle*, 590 F.2d 1011 (D.C. Cir. 1978) and *Corn Refiners Association, Inc.* v. *Costle*, 594 F.2d 1223 (8th Cir. 1979.) See also, *American Petroleum Institute* v. *EPA*, 540 F.2d 1023 (10th Cir. 1976); *CPC International, Inc.* v. *Train*, 540 F.2d 1320 (8th Cir. 1976); *FMC Corp.* v. *Train 539 F.2d 973 (4th Cir. 1976).*

While an upset is an unintentional episode during which effluent limitations guidelines are exceeded, a bypass is an act of intentional noncompliance during which waste treatment facilities are circumvented in emergency situations. Bypass provisions have, in the past, been included in NPDES permits.

EPA has determined that both upset and by-pass provisions should be included in NPDES permits and has promulgated NPDES regulations that include such permit provisions (40 CFR 122.41; 45 FR 14146, April 1, 1983). The upset provision establishes an upset as an affirmative defense to prosecution for violation of technology-based effluent limitations guidelines. The bypass provision authorizes bypassing to prevent loss of life, personal injury or severe property damage. Because permittees in the metal molding and casting category are entitled to upset and bypass provisions in NPDES permits, this final regulation does not address these issues.

XII. Variances and Modifications

Upon the promulgation of the final regulation, the numerical effluent limitations guidelines for the appropriate subcategory must be applied in all federal and state NPDES permits thereafter issued to metal molding and casting direct dischargers. In addition, upon promulgation, the pretreatment standards are directly applicable to indirect dischargers.

For the BPT effluent limitations guidelines, the only exception to the binding limitations is EPA's "fundamentally different factors" variance. *See, E. I. duPont de Nemours and Co.* v. *Train*, 430 U.S. 112 (1977); *Weyerhaeuser Co.* v. *Costle, supra.* This variance recognizes factors concerning a particular discharger that are fundamentally different from the factors considered in this rulemaking. However, the economic ability of the individual operator to meet the compliance cost for BPT effluent limitations guidelines is not a consideration for granting a variance. *See, National Crushed Stone Association* v. *EPA*, 449 U.S. 64 (1980). This variance clause was originally set forth in EPA's 1973–1976 industry regulations but is now cross-referenced in the metal molding and casting and other specific industry regulations. See the NPDES regulations at 40 CFR Part 125 Subparts A & D for the text and explanation of the "fundamentally different factors" variance.

The BAT limitations in this regulation also are subject to EPA's "fundamentally different factors" variance. In addition, BAT limitations for nonconventional pollutants are subject to modification under sections 301(c) and 301(g) of the Act. These statutory modifications do not apply to toxic or conventional pollutants. According to section 301(j)(1)(B), applications for these modifications must be filed within 270 days after promulgation of final effluent limitations guidelines. See 40 CFR 122.21(1)(2).

The economic modification section of the Act (Section 301(c)) gives the Administrator authority to modify BAT requirements for nonconventional pollutants for dischargers who file a permit application after July 1, 1978, upon showing that such modified requirements will: (1) Represent the maximum use of technology within the economic capability of the owner or operator, and (2) result in reasonable further progress toward the elimination of the discharge of pollutants. The environmental modification (Section 301(g)) allows the Administrator, with the concurrence of the State, to modify BAT limitations for nonconventional pollutants from any point source upon a showing by the owner or operator of such point source satisfactory to the Administrator that:

(a) Such modified requirements will result at a minimum in compliance with BPT limitations or any more stringent limitations necessary to meet water quality standards;

(b) Such modified requirements will not result in any additional requirements on any other point or nonpoint source; and

(c) Such modification will not interfere with the attainment or maintenance of that water quality which shall assure protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities, in and on the water, and such modification will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistence in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity, or teratogenicity), or synergistic propensities.

Section 301(j)(1)(B) of the Act requires that applications for modifications under section 301(c) or (g) be filed within 270 days after the promulgation of an applicable effluent limitations guideline regulation. Initial applications must be filed with the Regional Administrator and, in States with

approved NPDES programs, a copy must be sent to the Director of the State program. Initial applications to comply with section 301(j) must include the name of the permittee, the permit and outfall number, the applicable effluent limitations guideline regulation, and whether the permittee is applying for a 301(c) or 301(g) modification or both.

Indirect dischargers subject to PSES and PSNS are eligible for credits for pollutants removed by a POTW. See 40 CFR 403.7.

New sources subject to NSPS and PSNS are not eligible for any other statutory or regulatory modifications. See *E.I. duPont de Nemours & Co.* v. *Train, supra.*

Indirect dischargers subject to PSES are eligible for the "fundamentally different factors" variance. See 40 CFR 403.13. On September 20, 1983, the United States Court of Appeals for the Third Circuit held that "FDF variances for toxic pollutants are forbidden by the Act," and remanded § 403.13 to EPA. *NAMF et al.* v. *EPA*, 719 F.2d 624 (3rd Cir. 1983). In response to this decision, EPA amended § 403.13(b)(2) to suspend the availability of FDF variances for toxic pollutants covered by categorical pretreatment standards. See 49 FR 5131 (February 10, 1984). In addition, EPA sought review of this portion of the Third Circuit's decision. On February 27, 1985, the Supreme Court reversed the Third Circuit Court of Appeals and held that FDF variances for toxic pollutants are not prohibited by the Clean Water Act. *Chemical Manufacturers Assoc.* v. *Natural Resources Defense Council, 105.* S. Ct. 1102 (1985). Accordingly, indirect dischargers covered by categorical pretreatment standards for existing sources may be eligible for an FDF variance. Any interested person should refer to 40 CFR 403.13 for the procedures and deadline for applying for this variance.

XIII. Relationship to NPDES Permits

The BPT and BAT effluent limitations guildelines and NSPS in this regulation will be applied to individual metal molding and casting processes through NPDES permits issued by EPA or approved state agencies under section 402 of the Act. The preceding sections of this preamble discussed the binding effect of this regulation on NPDES permits, except to the extent that variances and modifications are expressly authorized. This section describes several other aspects of the interaction of this regulation and NPDES permits.

One matter that has been subject to different judicial views is the scope of NPDES permit proceedings in the absence of effluent limitations guidelines and standards. Under currently applicable EPA regulations, states and EPA Regions issuing NPDES permits before promulgation of this regulation did so on a case-by-case basis. This regulation provides a technical and legal base for any new permit proceedings.

Another noteworthy topic is the effect of this regulation on the powers of NPDES permit issuing authorities. The regulation does not restrict the power of any permit-issuing authority to act in a manner that is consistent with the law or these or any other EPA regulations, guidelines, or policy. For example, the fact that this regulation does not control a particular pollutant does not preclude the permit issuer from limiting such pollutant on a case-by-case basis when necessary to carry out the purposes of the Act. In addition, to the extent that state water quality standards or other provisions of state or Federal law require limitation of pollutants not covered by this regulation (or require more stringent effluent limitations on covered pollutants), the permit-issuing authority must apply such effluent limitations.

One additional topic that warrants discussion is the operation of EPA's NPDES enforcement program, many aspects of which have been considered in developing this regulation. The Agency wishes to emphasize that, although the Clean Water Act is a strict liability statute, the initiation of enforcement proceedings by EPA is discretionary (*Sierra Club* v. *Train*, 557 F.2d 485 (5th Cir. 1977)). EPA has exercised and intends to exercise that discretion in a manner that recognizes and promotes good faith compliance efforts.

XIV. Public Participation and Response to Major Comments

Individual metal molding and casting companies, trade associations,and government agencies have participated in the development of these regulations. Following the publication of the proposed rule on November 15, 1982, in the **Federal Register**, the technical Development Document, the economic impact analysis, and supporting record materials were made available for review by industry, governmental agencies, and the public sector. The comment period, originally scheduled to close on January 14, 1983, was extented to February 14, 1983. On January 10, 1983, a public hearing was held in Washington, DC on the proposed pretreatment standards. On January 12, 1983, a permit writers workshop was held in Chicago, IL. On November 12–13, 1983, a permit writers workshop was held in Buffalo, NY. EPA announced in the **Federal Register** on March 20, 1984 (49 FR 10280), the availability for public review of additional information and analysis, with the comment period closing on May 4, 1984. On November 13–14, 1984, a permit writers workshop was held in Buffalo, NY. EPA announced in the **Federal Register** on February 15, 1985 (50 FR 6572) the availability of further information and analyses. The comment period, originally scheduled to close on March 18, 1985, was extended to April 8, 1985. The Agency held permit writer workshops in Springfield, IL on February 19–20, 1985, and in Indianapolis, IN on April 16–17, 1985.

Since proposal, the Agency has received over 1500 individual comments from 94 different commenters on the proposal and the two notices of availability. The Agency also received more than 100 inquiries from the Members of Congress.

All comments received have been considered carefully and appropriate changes in the regulations have been made where data and information supported those changes. Those major issues raised by the comments that were not discussed previously in the preamble (see Summary of Changes to Proposed Regulations) are addressed in this section of the preamble. All comments received and detailed responses to these comments are included in three documents entitled *Responses to Public Comments, Proposed Metal Molding and Casting Effluent Limitations and Standards; Responses to Public Comments, March 20, 1984 Notice of Availability, Metal Molding and Casting Industry;* and *Responses to Public Comments. February 15, 1985 Notice of Availability, Metal Molding and Casting Industry.* These documents will be placed in the public record for this regulation.

The following is a discussion of the Agency's responses to the major comments.

A. Feasibility of and Data Base Supporting Complete Recycle

Comment: The most prevalent comment received by the Agency on the proposed regulation was that the proposed requirement for complete recycle with no allowance for wastewater discharge was not feasible technically. It was asserted that recycle systems must have discharge ("blowdown") to remove dissolved pollutants which would build up and otherwise cause scaling and corrosion. Commenters asserted that sophisticated,

costly, and undemonstrated technologies (e.g., reverse osmosis) were necessary to achieve complete recycle.

It also was asserted that numerous individual plants indicated by EPA to demonstrate complete recycle with no discharge were misrepresented in the data base. These commenters asserted that most of the plants in EPA's data base have recycle systems which do not demonstrate complete recycle because they discharge periodically to allow equipment repair and maintenance, regular removal of "wet" sludges, "discharges" to groundwater, discharges that are removed for off-site disposal by contract haulers, and discharges to adjacent industrial treatment facilities.

Response: EPA requested all plants with processes identified as having complete recycle with no discharge to verify the status of recycle and discharge. Responses to the Agency's requests revealed that a large portion of those plants previously considered to have complete recycle of wastewater actually had discharges on an intermittent basis, such as for repair and periodic maintenance. These discharges ranged from once per week to once in five years. Another group of plants also had discharges from recycle systems, but these discharges were not to surface waters or POTWs. Some plants had their discharges contract hauled off-site, and other plants reported or were suspected to have lossers of wastewater by seepage from storage ponds to groundwater. The Agency removed from the complete recycle/no discharge data base all such plants which reported discharges and thus were not valid demonstrations of complete recycle. The number of plants which were confirmed to be complete recycle/no discharge is substantially smaller than at proposal; they are concentrated in the following process segments: melting furnace scrubbers, dust collection scrubbers, grinding scrubbers, and slag quench.

As explained previously in Section V of this preamble, the Agency also performed a model analysis of recycle system water chemistry. The model analysis of 19 process segments for which sufficient data were available showed that achievable recycle rates did not vary appreciably with differing make-up (intake) water, and that high rate recycle or complete recycle was achievable even with the poorest quality make-up water. However, three processes in the ferrous subcategory (dust collection, melting furnace scrubber, and slag quench) were shown to be somewhat sensitive to poor quality make-up water. Recycle rates for these three process segments were decreased by the marginal differences (1–2 percent) in recycle rates between predicted recycle rates based on average and worst make-up water quality.

Some commenters asserted that total dissolved solids (TDS) build-up in recycle loops and cause scaling and corrosion. However, the Agency found that many plants successfully operate high rate recycle systems with very high TDS concentrations (greater than 40,000 mg/l).

Several commenters asserted that complete recycle of scrubber water would impact adversely the ability of plants to comply with air emissions standards. Responses by plants to Agency inquiries did not reveal (with the exception of one plant's assertions) that scrubber water recycle was a factor where violations of air standards occurred.

Recycle model sensitivity analysis showed that by increasing moisture and pollutant "blowdown" by way of sludges, recycle rates can be increased to a limited extent. Thus, some plants in the EPA data base may have achieved complete recycle by a water chemistry balance achieved in part by removing a portion of the problem constituents with the moisture in the sludge.

Recycle model analysis showed that recycle sidestream treatment would be necessary to retain the higher recycle rates (for the three ferrous process segments) not adjusted for make-up water quality. The investment and operating cost of sidestream treatment technology identified, chemical coagulation and sedimentation for silica and sulfate removal, was found to be very high for a small increase (96 to 98 percent) in recycle rates. Therefore, the final regulations do not utilize the higher recycle rates for these processes and are not based on sidestream treatment.

The Agency has updated and verified its data base and has selected recycle rates primarily based on the highest practicable recycle rates demonstrated in the industry. These recycle rates, presented in Appendix J of this preamble, have been selected with consideration of the influence of make-up water quality and related water chemistry (i.e., scaling, corrosion), recycle from central treatment, sludge moisture content, and other factors. Complete recycle with no discharge has been demonstrated in the industry and selected by the Agency for the three regulated grinding scrubber process segments. High rate recycle with allowance for blowdown discharge has been selected by the Agency for the 25 other process segments included in the final regulations. These recycle rates are the same as published in Appendix A of the February 15, 1985 notice, at 50 FR 6579. See the technical Development Document for a discussion of how these recycle rates were derived.

B. Central Treatment

Comment: A number of commenters asserted that the Agency had not considered central treatment of combined process wastewater streams and whether central treatment would affect a plant's ability to achieve high rate or complete recycle. Specifically, comments on the March 20, 1984 notice of availability stated that the Agency's recycle model did not include a sensitivity analysis of differences in achievable recycle rates, asserted to be significant, between plants with single processes and plants with central treatment of multiple processes.

Response: The Agency utilized the recycle model to analyze the influence on achievable recycle rates of combined treatment of two or more process wastewaters in a central treatment facility. In all cases analyzed, the combined recycle rate was found to *increase* with central treatment, *not decrease* as asserted in comments. The three individual ferrous process segments which did indicate marginal sensitivity to make-up water also showed decreases in recycle rates in central treatment application. However, the increases in discharge (blowdown) rates to account for make-up water quality were found to be adequate to allow facilities with central treatment to achieve the separate stream recycle rates. The recycle model also showed that plants, especially larger plants, which recycle back to the processess after their central treatment facilities, experience increased pollutant removals, thereby allowing achievement of sufficiently *higher* recycle rates, *not lower* as asserted in comments, such that the individual process recycle rates would be achieved or surpassed. Thus, recycle after central treatment of the entire wastewater volume was shown to be beneficial but not necessary in achieving recycle rates, even though such an approach can be more costly to implement. Further, older large plants could elect to upgrade these existing central treatment facilities rather than completely replace them with smaller blowdown central treatment systems.

EPA has carefully considered central treatment of combined process wastewater streams. A substantial portion of the data base used to establish the treatment effectiveness concentrations that form the basis of the final regulations are from metal molding

and casting plants employing central treatment systems treating multiple process streams. Additionally, EPA has established effluent limitations and standards for copper, lead, and zinc for each of the regulated process setments for which a discharge is allowed. This ensures that plants employing central treatment systems are given an allowance for metals present in all of the wastestreams discharged to the central treatment facilities.

C. Lime and Settle Treatment Effectiveness Data Base

Comment: A number of comments on the proposed regulations stated that the Agency had not used an appropriate data base for establishing effluent limitations for those process segments where discharges were allowed. It was asserted that the Agency's use of the Combined Metals Data Base (CMDB—the data base from well operated lime and settle treatment systems, used in other industries, that was used to establish lime and settle treatment effectiveness for the metal molding and casting industry) was not appropriate because these data represent treatment of wastewaters from industries whose wastewaters are not comparable to the metal molding and casting industry.

Comments on the Agency's analysis of ferrous foundry treatment effectiveness data, included in the February 15, 1985 notice (50 FR 6580, Appendix F), asserted that lime and settle treated effluent concentrations for lead and zinc, developed from EPA sampling data and all available industry discharge monitoring report (DMR) data, were not excessively high and did not warrant application of further treatment technologies being considered by EPA. Commenters asserted that the Agency has promulgated effluent limitations and standards for lead and zinc in other categories (i.e., inorganic chemicals, metal finishing) based on treated effluent concentrations that are higher than those being considered (Appendix F) for this category. These commenters urged that all DMR data available to the Agency be used in the treatment effectiveness analysis, and questioned the Agency's judgment that some of the DMR data required further confirmation.

Commenters questioned the Agency's statistical methodology that gave equal weight to plant level estimates regardless of the amount of data available from the plant. These commenters asserted that the short-term EPA data could not be used for analysis of variability, and that the industry DMR data should be weighted statistically based on the number of data points. It also was asserted that there were discrepancies in application of the data editing rules to the DMR data.

Response: Subsequent to proposal, the Agency acquired a substantial amount of DMR data from the metal molding and casting industry. Some of the long-term DMR data as well as the short-term sampling data acquired under EPA supervision were analyzed preliminarily and the results published in the March 20, 1984 notice, at 49 FR 10292–10294, and 10308–10310, Appendix F. The balance of the available DMR data were analyzed and the resulting limitations were presented for review and comment in the February 15, 1985 notice of availability, at 50 FR 6575, and 6580, Appendices D, E, and F. The results of these analyses indicated that limitations for lead and zinc, based on short-term EPA data and long-term confirmed DMR data, were higher than lead and zinc limitations based on the CMDB. The Agency indicated it still was considering using the CMDB, but efforts would be made to confirm all DMR data, and additional control technologies would be considered to reduce the concentrations of lead and zinc.

The Agency obtained additional supporting data and documentation from four plants for which DMR data were available but not confirmed. Three of these four plants sampled and analyzed the influent to and the effluent from their wastewater treatment systems. The fourth plant already had sampling data for both influent and effluent that were usable in the Agency's analysis. Based on these submissions, the Agency determined that the DMR data for three of the four plants could be considered confirmed and have been incorporated in the EPA plus confirmed DMR data base used to develop the final effluent limitations and standards. Data for one of the plants could not be used due to the presence of excessive quantities of noncontact cooling water commingled with process wastewaters in the plant's treatment system.

The Agency analyzed the edited EPA plus confirmed DMR data base, and developed final treatment effectiveness concentrations for lime and settle treatment. These concentrations are presented in Appendix K of this preamble. Comparison of these concentrations with the concentrations based on the CMDB reveals that some differences exist; lead limitations are higher, zinc limitations are approximately the same, and copper limitations are lower. Effluent limitations for TSS and oil and grease are approximately the same. Further comparisons of short-term EPA data with long-term DMR data reveals that in many cases DMR data were lower in concentration than short-term EPA data for the same plants. Recent short-term self-sampling by three plants in response to specific Agency requests further confirms the ranges of concentrations represented by the DMR data. Where differences do occur in effluent limitations based on CMDB and metal molding and casting data, the Agency has concluded that these differences may be attributable to variations in the chemistry of the wastewater matrices and concomitant differences in the solubility of these pollutants, especially metals, in treated effluents. Also, the suspended solids which contain the metals may include very fine particulates which do not coagulate or settle readily. The Agency has concluded that the treatment effectiveness concentrations for lime and settle treatment based on metal molding and casting industry data are the best data for developing the mass-based effluent limitations and standards contained in the final regulations.

The Agency has retained the use of short-term EPA sampling data together with long-term confirmed DMR data in developing the effluent limitations and standards. In cases where both short-term EPA data and DMR data were available from a plant, they were combined to determine statistically the long-term mean and variabilities in treatment effectiveness for the plant. These plant specific summary statistics are further combined, as described briefly in a preceding section of this preamble, in detail in the technical Development Document, and elsewhere in the rulemaking record, to determine the maximum monthly and maximum one-day effluent limitations and standards for the metal molding and casting category. This methodology does not rely solely on short-term EPA data to describe variability. In only a few cases are the final plant level estimates for a pollutant based only on short-term EPA data and these are combined with data from other plants that include extensive DMR data sets for use in the calculation of treatment effectiveness levels. The data have been combined in a statistically-appropriate manner. The Agency's objective was to represent properly the information from plants with appropriate treatment in the final limitations. This objective has been achieved. Further statistical weighting of the DMR data is neither necessary nor appropriate in this case.

Some minor errors in the description of the application of the data editing rules were found in the record

supporting the February 15, 1985 notice. The editing criteria were properly applied. Only the description of which criteria were applied to certain data points was incorrect in a few cases. These errors have been corrected. The Agency has included in the record a separate and complete listing of all data which have been used in developing the final treatment effectiveness concentrations for lime and settle technology.

D. Control of Toxic Organic Pollutants

Comment: Several commenters stated that toxic organic pollutants should be regulated as an aggregate, rather than by setting limitations for individual trace pollutants which would require unnecessarily expensive monitoring. Additionally, commenters suggested that requiring the application of activated carbon technology was unnecessary because existing systems employed in the industry, oil skimming and lime and settle treatment, are capable of removing significant levels of toxic organic pollutants.

Response: As explained previously, EPA found that plants in the metal molding and casting industry that employed effective oil and grease removal technologies effectively removed toxic organic pollutants. For this reason, the final regulations are not based on the application of activated carbon technology. Additionally, because the model BPT treatment option (recycle and lime and settle treatment with associated oil and grease removal equipment) is capable of effectively removing toxic organic pollutants from metal molding and casting wastewaters, EPA is not establishing BAT effluent limitations guidelines or standards of performance for new sources for toxic organic pollutants. EPA believes that compliance with the limitations and standards controlling oil and grease will effectively control toxic organics.

EPA has determined that toxic organic pollutants are likely to pass through POTWs. For that reason, EPA is establishing pretreatment standards controlling toxic organic pollutants. To reduce monitoring costs, EPA (a) is controlling Toxic Organics (TTO) rather than each individual toxic organic pollutant detected in metal molding and casting wastewaters, (b) has defined TTO differently for each process segment where TTO is regulated on the basis that different organic pollutants were found above treatable levels in the discharges from the various process segments, and (c) has established oil and grease as an alternative monitoring parameter for TTO to minimize monitoring costs. If oil and grease is controlled at the identified level, compliance with the TTO pretreatment standard will be assumed.

E. Applied Flow Data

Comment: One commenter requested an additional flow allowance for wet sluicing of dry baghouse scrubber dust. Another commenter noted that numerous miscellaneous process water sources present at plants in the metal molding and casting industry had not been identified by EPA in the proposal or subsequent notices.

Response: The Agency reviewed available data for process water sources not previously identified in the proposal or the March 1984 and February 1985 notices. The miscellaneous processes are not widely employed in the metal molding and casting industry. Therefore, insufficient information is available to characterize these miscellaneous wastestreams. Thus, in the final regulations, EPA is not establishing effluent limitations guidelines and standards for processes other than those discussed in the February 1985 notice. The need for flow allowances for these miscellaneous processes must be established and justified on a case-by-case basis during the permitting process. Permit writers will use their best professional judgment in establishing technology-based effluent limitations and standards for those miscellaneous streams, such as sluice water used to convey dry baghouse scrubber dust, which are not covered by this regulation.

F. Environmental Assessment/Small Plant Exclusion

Comment: In comments on the February 15, 1985 notice, the Small Business Administration (SBA) asserted that there were numerous errors in the environmental assessment made available in the record supporting the February 15, 1985 notice. Most of the SBS's detailed comments focused on the data used to represent current discharge levels. SBA stated that, after these errors were corrected, a revised environmental assesssment would confirm their assertion that regulation of small plants (less than 100 employees) would yield no environmental improvement. SBA and other commenters requested that EPA exempt, or adopt less stringent regulatory standards for, ferrous foundries employing less than 100 employees and that EPA exempt from national regulation all nonferrous foundries. The commenters asserted that EPA was authorized to implement these recommendations by the Settlement Agreement in *NRDC* v. *Costle,* and that the recommended approach is consistent with other Agency decisions to exclude from national regulations discharges of toxic pollutants in amounts below one kilogram per plant per day.

Response: In response to comments, the Agency reevaluated all of the data used in the environmental assessment, including data used to characterize raw wastewaters, current discharges, and discharges for each of the technology options. The Agency did not find data input or computer errors as asserted in comments. However, upon detailed review, the Agency did find that certain of the short-term EPA sampling data used to characterize raw wastewaters had not been used properly. The Agency found that raw waste mass loads for plants which were sampled were utilized incorrectly in calculating the raw waste loads for the various process segments. Even in cases where a plant which was sampled had an applied flow different from the applied flow determined by the Agency to be representative of the process segment, the plant's actual measured raw waste concentration was still used with the process segment applied flow rate to calculate the mass loading for the process segment. This resulted in the use of erroneous mass loading to characterize raw wastewaters for the process segment. The Agency recalculated all raw waste data based on the masses of pollutants found at sampled plants, rather than the concentrations, so that the raw wasteloads for each process segment would be characterized properly. The final regulations and EPA's assessment of current pollutant discharge levels are based on the corrected information.

The NRDC consent decree requires that the Agency promulgate nationally-applicable effluent limitations guidelines and standards for 21 major industries, including the metal molding and casting category. Under Paragraph 8 of the consent decree, the Agency may exempt certain pollutants or industrial subcategories from national regulations provided that EPA makes certain findings. In the past, EPA has not exempted portions of a subcategory from nationally-applicable BAT regulations under the conditions specified in Paragraph 8 of the consent decree. Decisions have been made on a subcategory-wide basis. In certain of these cases, the average raw waste discharges of toxic pollutants from all plants in the subcategory approached one kilogram (2.2 pounds) per plant per day. Over the next two years, EPA will be reviewing several of these decisions

to re-evaluate their appropriateness. Included will be reviews of the Paragraph 8 decisions for the caustic and/or water wash subcategories of the paint and ink categories and the industrial laundries subcategory of the auto and other laundries category.

In the case of the metal molding and casting industry, substantial quantities of toxic pollutants are expected to be discharged from plants in every regulated subcategory—raw waste discharge levels range from 6.5 to over 220 pounds per plant per day depending on the subcategory considered. Toxic pollutant discharges from small metal molding and casting plants (less than 50 employees) are also expected to be substantial—raw waste discharge levels range from 166 pounds per year per plant (aluminum casting subcategory) to over 27,000 pounds per year per plant (ferrous subcategory). For all the reasons discussed elsewhere in this preamble, we have decided to establish nationally-applicable effluent limitations guidelines and standards to regulate these discharges.

The commenter also appears to misunderstand the significance of a decision not to establish national regulations for a subcategory. Such a decision would not exempt direct dischargers in that subcategory from being required to obtain an NPDES permit in order to discharge wastewaters. The Clean Water Act requires that EPA issue NPDES permits to direct dischargers that contain, at a minimum, technology-based effluent limitations that reflect the best practicable control technology currently available, the best available technology economically achievable, and the best conventional pollutant control technology, regardless of the size of the discharging plant. If these technology-based levels of control have not been established by national regulations, they must be determined on a case-by-case basis. In the event that these requirements do not adequately protect receiving waters, the permit authority would issue more stringent limitations based on state water quality considerations.

The Agency has found that treatable levels of toxic pollutants (both metals and organics) and other pollutants (suspended solids, oil and grease, and total phenols) are present in wastewater discharges from all subcategories of the metal molding and casting industry. Thus, limitation based on the application of some level of treatment technology must be specified, whether case-by-case permits are issued or if nationally-applicable limitations and standards were applied uniformly throughout the country. Taking this into account and also noting that the industry is comprised of about 796 direct and indirect discharging plants, 247 of which are projected to be small plants (plants that employ less than 50 employees), the Agency has determined that it is the best use of EPA, State, and local resources to establish nationally-applicable standards for the metal molding and casting industry rather than to make separate, case-by-case determinations of appropriate limitations and standards. Thus, with the exception of the magnesium subcategory, where we have determined that nationally-applicable effluent limitations and standards are not economically achievable, EPA is establishing regulations applicable to all discharging metal modeling and casting plants, including small plants.

G. Economic Analysis

Comment: Commenters asserted that the economic impact of effluent limitations and standards being considered has been understated because (a) sales revenues were overestimated, especially for small plants, (b) financial ratios projected for 1986 overestimate the financial strength of the industry in light of the major downturn in the industry since 1978, (c) economic impact criteria now rely solely on plant closure as the basis for considering less costly regulatory options, (d) the influence of foreign competition on the demand for domestic castings was not considered, are (e) compliance costs have been underestimated, particularly for small plants.

The Small Business Administration recommended that EPA use the FINSTAT data base in place of the Dun and Bradstreet data base as the source of financial profiles for this industry. SBA also commented that its analysis of EPA's cost data showed a larger number of plant closures than that estimated by the Agency. SBA also commented that EPA had not conducted sufficient sensitivity analyses of the impacts on foundries.

EPA also received comments that, in view of the likelihood of severe economic impact on small plants, EPA must prepare a Regulatory Flexibility Analysis. The Small Business Administration stated that EPA should consider less stringent regulatory options for small plants or exemptions for small plants from all categorical regulations.

Response: In response to comments, the Agency has made the following changes in the methodology and data base used for the economic impact analysis.

With regard to plant sales estimates, including those of small plants, the Agency is basing sales on production data reported in the DCPs and then extrapolated to the industry according to metal type and foundry size. The production data were adjusted downward to account for the economic conditions experienced by the industry in more recent years. The magnitude of the production reductions ranged from 30 percent to 65 percent depending upon the particular metal type. The respective percentage declines were applied to all foundries in a subcategory regardless of size. Costs were adjusted downward using cost curves that account for the fixed nature of certain operating and maintenance costs; the cost adjustments are therefore proportionally less than the reductions in production and sales revenue. These adjustments make EPA's production estimates more consistent with values reported by other sources, notably Bureau of the Census.

The Agency is confident that these production and cost data are the best available since they represent data reported directly by the industry (including many small foundries). These data have been adjusted to account for more recent economic conditions, therefore more accurately reflecting the ability of the industry to comply with this regulation.

With regard to the financial ratio values used to estimate the industry's health (and in response to SBA's recommendation concerning financial data), the Agency is using the FINSTAT data base presented by SBA to project the financial strength of the industry. The FINSTAT data base includes financial records from the period 1975 to 1984. These data are now used in the economic impact analysis as the basis for financial profiles. In estimating the quartile ratios needed for the economic analysis, EPA rejected observations that either (1) did not satisfy SBA's consistency criteria or (2) failed the threshold tests used in the economic impact analysis. EPA believes that inclusion of firms whose ratios do not meet the threshold tests would be inconsistent with the use of the tests. The Agency is confident that this multi-year data base represents the best available information on foundry financial performance and that incorporation of the FINSTAT data in the economic impact analysis has provided more reliable results for this particular industry.

The financial test cut-off values used in the economic analysis are based on a

thorough review of financial literature verified by data for recent closures in the industry. Review of the FINSTAT and Dun & Bradstreet date bases show that many metal molding and casting plants with weaker values remain in business for extended periods. Therefore, use of more stringent values (as suggested by SBA) is inconsistent with available data.

With regard to the financial impacts used to consider alternative regulatory options, plant closure is the primary indicator that triggers consideration of less stringent options. However, the Agency considered several other financial impact measures in determining the appropriate options. The impacts of compliance costs as they relate to sales and production costs were two major impact measures considered by the Agency. The many other financial impact measures examined and considered by the Agency are reported in the economic impact analysis. EPA especially examined the closures and financial measures results for small foundries.

With regard to the effect of impacts of foreign castings on the competitive ability of domestic manufacturers, the Agency has included such considerations in the economic analysis. Although imports are increasing, the value of foreign castings is less than three percent of the total U.S. market. The major sources of competition for the foundries affected by this regulation are the domestic foundries which do not discharge wastewaters and thus incur no compliance costs as a result of the regulation.

With regard to comments made by the Small Business Administration, EPA has made the following changes in its analysis. First, the Agency has adopted SBA's FINSTAT data base as the basis for determining the financial status of the industry. Second, EPA has considered SBA's comments on the values used in the economic analysis for closure criteria. Based on all information and data available (including that provided by SBA), EPA has retained the cut-off values for the three financial tests used to determine closures. Third, EPA has increased compliance costs where appropriate. These revisions, which deal with operating labor requirements and other changes, leave EPA's analysis largely in agreement with SBA insofar as costs are concerned. Given the changes made with regard to its sales and cost estimates, an additional sensitivity analysis is not warranted.

The Agency has selected regulatory options that are appropriate in view of the statutory requirements and in view of the costs and effluent reductions achieved. In view of these costs and pollutants removals, EPA has selected the same option selected for BPT to be the basis for BAT effluent limitations for plants in the aluminum subcategory and the steel segment of the ferrous subcategory. In addition, the smallest plants in the ferrous subcategory that cast primarily malleable iron (less than 3,557 tons of metal poured per year) have BAT equal to BPT, and small gray iron plants (less than 1,784 tons of metal poured per year) have PSES equal to BPT (Option 2). Also, the Agency has exempted magnesium plants from these regulations because of the projected severe economic impacts projected for this subcategory. All of the exempt magnesium foundries are small plants.

In view of the few remaining closures projected from small foundries, the Agency has determined the preparation of a Regulatory Flexibility Analysis is not appropriate or necessary. The Agency has, however, included a small business analysis within the overall economic impact analysis.

H. Control Technologies

Comment: A few commenters asserted that the entire train of model control technologies being considered by the Agency has not been demonstrated at any plants within the industry, particularly as they would be applied at plants with multiple processes and central treatment facilities. Chemical oxidation by potassium permanganate, and carbonate and sulfide precipitation of metals also were cited specifically as technologies that commenters asserted have not been demonstrated in the industry. The transfers of these technologies were asserted to be unsupported, and their use was considered expensive, and technically problematic. Moreover, the commenters indicated that the Agency's treated effluent concentrations for total phenols (4AAP) published in the February 15, 1985 notice (50 FR 6580, Appendices D–F) were the result of dilution and incidental removal, not chemical oxidation.

Response: The model BPT control technology train generally consists of high rate recycle followed by blowdown treatment with lime and settle. High rate recycle is widely demonstrated by plants in this industry, and has been discussed at length in the March 20, 1984 notice, at 49 FR 6573–6574, summarized in a preceding section of this preamble, and discussed in detail in the technical Development Document. A significant number of these plants incorporate central treatment. The treatment effectiveness data base for lime and settle treatment is from metal molding and casting plants, almost all of which have high rate recycle and central treatment of combined process wastewaters. Therefore, the key control and treatment technologies (recycle, and lime and settle treatment) which serve as the basis for BPT effluent limitations have been widely demonstrated.

Chemical oxidation by potassium permanganate has received very limited application in this industry. The commenters are correct that the effluent limitations for total phenol are not based on treatment systems with potassium permanganate oxidation. The Agency attempted to obtain data on this technology but no usable data were available. The total phenol limitations are based on incidental removal through lime and settle treatment systems. It should be noted that information and data in the literature on a pilot chemical oxidation treatment system and a recent EPA pilot treatability study reveal that the potasium permanganate technology is available and applicable to metal molding and casting wastewaters, and the effluent limitations for total phenol (4AAP) are achievable readily. The cost of potassium permanganate oxidation has been included in the lime and settle treatment system for those ten process segments where treatable quantities of phenols are present. This technology is not any more difficult to implement than the other technologies incorporated in the basis for the regulations. Moreover, the cost of potassium permanganate is not excessive and effluent limitations based on the entire recycle, lime and settle model treatment system were found to be economically achievable.

Filtration technology is widely used in industrial wastewater treatment, and it has been applied in the metal molding and casting industry. Those few applications in the metal molding and casting industry for which a limited amount of filtration performance data are available have not been used in developing BAT limitations because they are for plants which either have other than lime and settle treatment preceding filtration (e.g., biological treatment, simple settle) or treat very low strength wastewaters. As described in a preceding section of this preamble, data from a pilot filtration study on metal molding and casting wastewaters was not used to establish limitations based on filtration because of significantly higher lime and settle effluent concentrations influent to that pilot filter. Therefore, as indicated in the February 15, 1985 notice at 50 FR 6576, the Agency is adopting treatment effectiveness data for filtration applied

in other industries (porcelain enameling and nonferrous smelting and refining), as described in the proposal.

Residual toxic metals removal by carbonate and sulfide precipitation technologies are applicable alternatives to metal molding and casting industry wastewaters. However, the data available are limited, with no application of sulfide precipitation in this industry. Therefore, the Agency is relying on filtration for removal of residual toxic metals.

The commenters are correct that there are no plants known to the Agency which have all of the model treatment system components in place in the sequence selected, and long-term data available to describe their performance. However, the data which are available indicate that plants in both the ferrous and nonferrous industry segments are achieving the BPT effluent treatment effectiveness concentrations based on lime and settle. Therefore, the Agency has concluded that all of the technologies are applicable and have been implemented on at least a limited basis in this industry, and that the effluent limitations and standards are achievable and available to the metal molding and casting industry.

I. Dry Scrubbers

Comment: In response to the Agency's request for information on the viability of substituting dry scrubbers for wet scrubbers, one commenter presented the results of a study which indicated that a totally dry metal molding and casting plant is not necessarily optimal and may not be feasible in all cases. The reason cited in support of this conclusion was that the choice between wet and dry scrubbing equipment was affected by site specific factors, such as moisture content of the air stream, dust loading and particle size distribution, and scrubber total life cycle and cost. Another commenter stated that the presence of combustible materials may prevent the use of dry scrubbers. Finally, it was asserted in comments that the Agency had not considered the cost of replacing a wet scrubber with a dry scrubber, and the potential for changes in air emissions that may effect compliance with air pollution permits.

Response: The Agency has concluded that while replacing wet scrubbers with dry scrubbers may be a feasible alternative to wastewater treatment in many cases, site specific factors cited by commenters will prevent some plants, including new sources, from converting to dry scrubbers. Therefore, conversion to dry scrubbers has not been included as the basis for effluent limitations and standards applicable to this industry.

J. Guidance to Permit Authorities

Comment: A few commenters stated that the Agency must provide guidance to permitting and pretreatment authorities to ensure proper use of the effluent limitations and standards for plants with single processes, and for integrated plants with more than one process where central treatment is employed. These commenters also asserted that without additional clarification and guidance, plants may be subjected to permit conditions which specify flow rates, recycle and blowdown rates, technologies, or other conditions. Such specific permit conditions would eliminate the flexibility plants should have in complying with these effluent limitations and standards.

Response: The Agency has included a detailed presentation in the technical Development Document which provides guidance to permitting and pretreatment authorities in the use of these regulations. This guidance clearly states that the Agency is not regulating flow rates, recycle rates, and blowdown rates, nor is it specifying control technologies. Example permit limitations are developed for hypothetical plants to illustrate the intended use of the regulations.

K. Inadequate Notice and Opportunity for Comment

Comment: Comments on the February 15, 1985 notice asserted that EPA has not identified specific technologies, costs, effluent reduction benefits and associated effluent limitations and standards based upon best practicable technology, best available technology, standards of performance for new sources, and pretreatment standards for new and existing sources. These commenters believe that in the absence of specific limitations and standards, and indications in the record of consideration of other statutory criteria, EPA has not given adequate notice and opportunity for comment. Also, it was asserted that the length of time allowed for comment was not adequate, and that the record was incomplete and contained discrepancies.

Response: The Agency has provided detailed notice and extensive opportunity for comment on how new information and data were likely to affect final regulations. After the regulations were proposed, the Agency worked cooperatively with industry trade associations and individual companies to identify in detail and obtain the information and data necessary to correct and update the data base used to establish the final regulations. More than 250 plants were contacted, including seven plant sampling visits and 38 plant engineering visits, to gather new information. The Agency published in the **Federal Register** for March 20, 1984, at 49 FR 10280, an extensive notice of availability which discussed in detail the supplementary information and date gathered after proposal, and the preliminary technical and economic analysis of that information. The notice covered important issues raised in prior comments and all aspects of the basis for final regulations including data gathering, subcategorization, data base verification, analysis of recycle, treatment effectiveness data base, method for calculation of mass-based effluent limitations, control technologies and costs, economic impact analysis, regulatory flexibility, and further solicitation of comments. The Agency also presented tabulations of important information and data, including a tabulation of mass-based effluent limitations for the primary technology option (recycle, lime and settle) under consideration (at 49 FR 10308–10310, Appendix F). The Agency provided a 45 day comment period, and sent a complete copy of the entire supplementary record to each of two trade associations (American Foundrymen's Society, American Die Casting Institute) to assist in thorough and timely review and presentation of comments.

The Agency published in the **Federal Register** for February 15, 1985, at 50 FR 6572, a second notice of availability which discussed in detail the results of further analyses of information received after the March 20, 1984 notice. The notice discussed important issues raised in comments on the March 20, 1984 notice, and all technical, economic, and environmental analyses that would bear upon development of final regulations. The Agency provided a complete copy of the entire supplementary record to each of the two trade associations. A 30-day comment period was provided originally, and extended to 51 days after difficulties were encountered in reproducting and shipping the two copies of the record.

The Agency chose not to select among options for these two notices in order to contribute to a more balanced presentation of comments on all issues and areas of analysis. Nonetheless, it is the Agency's judgment that these two notices presented very clear indications of the Agency's intentions in proceeding toward final regulations.

XV. Availability of Technical Information

The major documents on which this regulation is based are (1) *Development Document for Effluent Limitations Guidelines, New Source Performance Standards, and Pretreatment Standards for the Metal Molding and Casting Point Source Category* (USEPA, Washington, D.C., October 1985), (2) *Economic Impact Analysis of Effluent Limitations Guidelines and Standards for the Metal Molding and Casting Industry* (USEPA, Washington, D.C., October 1985), (3) *Response to Public Comments, Proposed Metal Molding and Casting Effluent Limitations Guidelines and Standards* (USEPA, Washington, D.C., October 1985), and (4) *Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants* (USEPA, Cincinnati, Ohio, April 1977).

On December 14, 1985, copies of the technical Development Document and the economic analysis will be available for public review in EPA's Public Information Reference Unit, Room 2404 (Rear) (EPA Library), 401 M Street, SW., Washington, DC on January 3, 1986, the complete Record, including the Agency's responses to comments on the proposed regulation, will be available for review at the Public Information Reference Unit. The EPA information regulation (40 CFR Part 2) allows the Agency to charge a reasonable fee for copying.

Copies of the technical Development Document and the economic analysis may also be obtained from the National Technical Information Service (NTIS), Springfield, Virginia 22161 (703/487-6000). A notice will be published in the **Federal Register** announcing the availability of these documents from NTIS). (This should occur within 60 days of publication of this regulation.)

XVI. Office of Management and Budget (OMB) Review

This regulation was submitted to the Office of Management and Budget (OMB) for review as required by Executive Order 12291. Written comments made by OMB are in the record for this final rulemaking.

XVII. List of Subjects

Iron and steel foundries, Nonferrous foundries, Waste treatment and disposal, Water pollution control.

Dated: October 8, 1985.

Lee M. Thomas,

Administrator.

Appendix A—Abbreviations, Acronyms, and Other Terms Used in This Notice

Act—The Clean Water Act.

Agency—The U.S. Environmental Protection Agency.

BAT—The best available technology economically achievable under section 304(b)(2) of the Act.

BCT—The best conventional pollutant control technology, under section 304(b)(4) of the Act.

BMP—Best management practices under section 304(e) of the Act.

BPT—The best practicable control technology currently available under section 304(b)(1) of the Act.

Clean Water Act—The Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 *et seq.*), as amended by the Clean Water Act of 1977 (Pub. L. 95-217).

Direct Discharger—A plant that discharges of may discharge pollutants into waters of the United States.

Indirect Discharger—A plant that introduces or may introduce pollutants into a publicly owned treatment works.

NPDES Permit—A National Pollutant Discharge Elimination System permit issued under section 402 of the Act.

NSPS—New source performance standards under section 306 of the Act.

POTW—Publicly owned treatment works.

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

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

RCRA—Resource Conservation and Recovery Act (Pub. L. 94-589) of 1976, as amended.

Appendix B—Pollutant Parameters Regulated

Subcategory and process segment	Characteristic pollutants				Toxic pollutants			
	pH	TSS	O&G	Phenol [1]	TT [2]	Copper	Lead	Zinc
Aluminum:								
Casting cleaning	X	X	X			X	X	X
Casting quench	X	X	X		X	X	X	X
Die casting	X	X	X	X	X	X	X	X
Dust collection scrubber	X	X	X	X	X	X	X	X
Grinding scrubber	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]
Investment casting	X	X	X		X	X	X	X
Melting furnace scrubber	X	X	X	X	X	X	X	X
Mold cooling	X	X	X		X	X	X	X
Copper:								
Casting quench	X	X	X		X	X	X	X
Direct chill casting	X	X	X			X	X	X
Dust collection scrubber	X	X	X	X	X	X	X	X
Grinding scrubber	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]
Investment casting	X	X	X		X	X	X	X
Melting furnace scrubber	X	X	X	X	X	X	X	X
Mold cooling	X	X	X		X	X	X	X
Ferrous:								
Casting cleaning	X	X	X			X	X	X
Casting quench	X	X	X		X	X	X	X
Dust collection scrubber	X	X	X	X	X	X	X	X
Grinding scrubber	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]
Investment casting	X	X	X		X	X	X	X
Melting furnace scrubber	X	X	X	X	X	X	X	X
Mold cooling	X	X	X		X			
Slag quench	X	X	X		X	X	X	X
Wet sand reclamation	X	X	X	X	X	X	X	X
Zinc:								
Casting quench	X	X	X		X	X	X	X
Die casting	X	X	X	X	X	X	X	X
Melting furnace scrubber	X	X	X	X	X	X	X	X
Mold cooling	X	X	X		X	X	X	X

[1] Total Phenols—Phenol as measured by the 4 aminoantipyrene method—4AAP.

[2] TTO—Total Toxic Organics measured as the sum of all toxic organic compounds found in treatable concentrations. See the "General definitions" section of the attached regulation (§ 464.02); for the definition of TTO and the "Specialized definitions" sections of the attached regulation (§ 464.11, 464.21, 464.31, and 464.41) for lists of the specific toxic organics included in TTO for each subcategory segment. Limitations for TTO are established only for PSES and PSNS.

[3] No discharge of pollutants.

Appendix C—Toxic Pollutants Not Detected or Not Detected At or Above the Nominal Analytical Limits of Quantification in Any Subcategories of the Metal Molding and Casting Point Source Category

2. acrolein
3. acrylonitrile
8. 1,2,4-trichlorobenzene
9. hexachlorobenzene
12. hexachloroethane
16. chloroethane
17. bis(chloro methyl) ether (deleted)
19. 2-chloroethyl vinyl ether (mixed)
25. 1,2-dichlorobenzene
26. 1,3-dichlorobenzene
27. 1,4-dichlorobenzene
28. 3,3-dichlorobenzidine
29. 1,1-dichloroethylene
32. 1,2-dichloropropane
33. 1,2-dichloropropylene (1,2-dichloropropene)
37. 1,2-diphenylhydrazine
40. 4-chlorophenyl phenyl ether
41. 4-bromophenyl phenyl ether
42. bis(2-chloroisopropyl) ether
46. methyl bromide (bromomethane)
47. bromoform (tribromomethane)

49. trichlorofluoromethane (deleted)
50. dichlorodifluoromethane (deleted)
51. chlorodibromomethane
52. hexachlorobutadiene
53. hexachlorocyclopentadiene
61. N-nitrosodimethylamine
79. benzo(ghi) perylene (1,12-benzoperylene)
82. dibenzo(a,h)anthracene (1,2,5,6-dibenzanthracene)
83. indeno (1,2,3-cd)pyrene(2,3,o-phenylenepyrene)
88. vinyl chloride (chloroethylene)
89. aldrin
90. dieldrin
91. chlordane
92. 4,4'-DDT
93. 4,4'-DDE
94. 4,4'-DDD (p,p' TDE)
95. a-endosulfan (Alpha)
96. b-endosulfan (Beta)
97. endosulfan sulfate
98. endrin
100. heptachlor
101. heptachlor epoxide
102. alpha-BHC
103. beta-BHC
104. gamma-BHC
105. delta-BHC
113. toxaphene
116. asbestos
129. 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

Appendix D—Aluminum Subcategory

Toxic Pollutants Not Detected or Not Detected At or Above the Nominal Analytical Limits of Quantification

14. 1,1,2-trichloroethane
20. 2-chloronaphthalene
30. 1,2-trans-dichloroethylene
35. 2,4-dinitrotoluene
36. 2,6-dinitrotoluene
43. bis(2-choroethoxy) methane
45. methyl chloride (chloromethane)
54. isophorone
56. nitrobenzene
69. di-n-octyl phthalate
74. 3,4-benzofluoranthene
75. benzo(k)fluoranthene (11,12-benzofluoranthene)
99. endrin aldehyde
114. antimony
117. beryllium
118. cadmium
125. selenium
126. silver
127. thallium

Toxic Pollutants Present in Amounts Too Small to be Reduced Effectively by Technologies Known to the Administrator

106. PCB–1242 (Arochlor 1242)
107. PCB–1254 (Arochlor 1254)
108. PCB–1221 (Arochlor 1221)
109. PCB–1232 (Arochlor 1232)
110. PCB–1248 (Arochlor 1248)
111. PCB–1260 (Arochlor 1260)
112. PCB–1016 (Arochlor 1016)
115. arsenic
119. chromium
121. cyanide (total)
123. mercury
124. nickel

Toxics Pollutants Detected in the Effluent From Only a Small Number of Sources

5. benzidine
6. carbon tetrachloride
10. 1,2-dichloroethane
13. 1,1-dichloroethane
15. 1,1,2,2-tetrachloroethane
18. bis(2-chloroethyl) ether
24. 2-chlorophenol
31. 2,4-dichlorophenol
38. ethylbenzene
48. dichlorobromomethane
57. 2-nitrophenol
58. 4-nitrophenol
59. 2,4-dinitrophenol
60. 4,6-dinitro-o-cresol
62. N-nitrosodiphenylamine
63. N-nitrosodi-n-propylamine
64. pentachlorophenol
71. dimethyl phthalate
77. acenaphthylene

Appendix E—Copper Subcategory

Toxic Pollutants Not Detected or Not Detected At or Above the Nominal Analytical Limits of Quantification

4. benzene
5. benzidine
7. chlorobenzene
10. 1,2-dichloroethane
13. 1,1-dichloroethane
15. 1,1,2,2-tetrachloroethane
18. bis(2-chloroethyl) ether
20. 2-chloronaphthalene
24. 2-chlorophenol
30. 1,2-trans-dichloroethylene
31. 2,4-dichlorophenol
35. 2,4-dinitrotoluene
38. ethylbenzene
39. fluoranthene
43. bis(2-choroethoxy) methane
44. methylene chloride (dichloromethane)
48. dichlorobromomethane
54. isophorone
56. nitrobenzene
59. 2,4-dinitrophenol
60. 4,6-dinitor-or-cresol
62. N-nitrosodiphenylamine
63. N-nitrosodi-n-propylamine
80. fluorene
86. toluene
99. endrin aldehyde
106. PCB–1242 (Arochlor 1242)
107. PCB–1254 (Arochlor 1254)
108. PCB–1221 (Arochlor 1221)
109. PCB–1232 (Arochlor 1232)
110. PCB–1248 (Arochlor 1248)
111. PCB–1260 (Arochlor 1260)
112. PCB–1016 (Arochlor 1016)
114. antimony
117 beryllium
125. selenium
127. thallium

Toxic Pollutants Present in Amounts Too Small to be Reduced Effectively by Technologies Known to the Administrator

115. arsenic
121. cyanide (total)
123. mercury
126. silver

Toxic Pollutants Detected in the Effluent From Only a Small Number of Sources

6. carbon tetrachloride
11. 1,1,1-trichloroethane
14. 1,1,2-trichloroethane
21. 2,4,6-trichlorophenol
36. 2,6-dinitrotoluene
45. methyl chloride
57. 2-nitrophenol
69. di-n-octyl phthalate
73. benzo(a)pyrene
85. tetrachloroethylene
87. trichloroethylene
118. cadmium
119. chromium
124. nickel

Appendix F—Ferrous Subcategory

Toxic Pollutants Not Detected or Not Detected At or Above the Nominal Analytical Limits of Quantification

5. benzidine
6. carbon tetrachloride
7. chlorobenzene
10. 1,2-dichloroethane
13. 1,1-dichloroethane
14. 1,1,2-trichloroethane
15. 1,1,2,2-tetrachloroethane
18. bis(2-chloroethyl) ether
21. 2,4,6-trichlorophenol
38. ethylbenzene
45. methyl chloride (chloromethane)
48. dichlorobromomethane
63. N-nitrosodi-n-propylamine
73. benzo(a)pyrene (3,4-benzopyrene)

Toxic Pollutants Present in Amounts Too Small To Be Reduced Effectively by Technologies Known to the Administrator

20. 2-chloronaphthalene
115. arsenic
117. beryllium
121. cyanide (total)
123. mercury
126. silver
127. thallium

Toxic Pollutants Detected in the Effluent From Only a Small Number of Sources

4. benzene

11. 1,1,1-trichloroethane
22. para-chloro-meta-cresol
24. 2-chlorophenol
30. 1,2-trans-dichloroethylene
35. 2,4-dinitrotoluene
36. 2,6-dinitrotoluene
43. bis(2-chloroethoxy) methane
54. isophorone
56. nitrosbenzene
57. 2-nitrophenol
58. 4-nitrophenol
59. 2,4-dinitrophenol
60. 4,6-dinitro-o-cresol
62. N-nitrosodiphenylamine
69. di-n-octyl phthalate
74. 3,4-benzofluoranthene
75. benzo(k)fluoranthene
85. tetrachloroethylene
86. toluene
87. trichloroethylene
99. endrin aldehyde
106. PCB–1242 (Arochlor 1242)
107. PCB–1254 (Arochlor 1254)
108. PCB–1221 (Arochlor 1221)
109. PCB–1232 (Arochlor 1232)
110. PCB–1248 (Arochlor 1248)
111. PCB–1260 (Arochlor 1260)
112. PCB–1016 (Arochlor 1016)

Toxic Pollutants for Which Equal or More Stringent Protection Is Provided by Existing Effluent Limitations and Standards

114. antimony
118. cadmium
119. chromium
124. nickel
125. selenium

Appendix G—Zinc Subcategory

Toxic Pollutants Not Detected or Not Detected at or Above the Nominal Analytical Limit of Quantification

5. benzidine
7. chlorobenzene
10. 1,2-dichloroethane
13. 1,1-dichloroethane
14. 1,1,2-trichloroethane
15. 1,1,2,2-tetrachloroethane
18. bis(2-chloroethyl) ether
20. 2-chloronaphthalene
35. 2,4-dinitrotoluene
36. 2,6-dinitrotoluene
43. bis(2-chloroethoxy) methane
45. methyl chloride (chloromethane)
48. dichlorobromomethane
54. isophorone
56. nitrobenzene
57. 2-nitrophenol
60. 4,6-dinitro-o-cresol
62. N-nitrosodiphenylamine
63. N-nitrosodi-n-propylamine
64. pentachlorophenol
71. dimethyl phthalate
73. benzo(a)pyrene (3,4-benzopyrene)
74. 3,4-benzofluoranthene
75. benzo(k)flouranthene (11,12-benzofluoranthene)
77. acenapthylene
80. flourene
99. endrin aldehyde
114. antimony
115. arsenic
117. beryllium
118. cadmium
119. chromium
125. selenium
126. silver
127. thallium

Toxic Pollutants Present in Amounts Too Small To Be Reduced Effectively by Technologies Known to the Administrator

106. PCB–1242 (Arochlor 1242)
107. PCB–1254 (Arochlor 1254)
108. PCB–1221 (Arochlor 1221)
109. PCB–1232 (Arochlor 1232)
110. PCB–1248 (Arochlor 1248)
111. PCB–1260 (Arochlor 1260)
112. PCB–1016 (Arochlor 1016)
121. cyanide (total)
123. mercury
124. nickel

Toxic Pollutants Detected in the Effluent From Only a Small Number of Sources

4. benzene
6. carbon tetrachloride
11. 1,1,1-trichloroethane
23. chloroform
30. 1,2-trans-dichloroethylene
38. ethylbenzene
58. 4-nitrophenol
59. 2,4-dinitrophenol
67. butyl benzyl phthalate
69. di-n-octyl phthalate
72. benzo(a)anthracene
76. chrysene
78. anthracene
81. phenanthrene
84. pyrene

Appendix H

Subcategories and Process Segments Not Regulated Because They Do Not Generate Process Wastewater

Nickel Casting
Tin Casting
Titanium Casting

Appendix I

Other Subcategories and Process Segments Not Regulated by the Metal Molding and Casting Regulations

Magnesium Casting—Compliance with regulations is not economically achievable for existing sources and would pose a barrier to entry for new sources

Lead Casting—Now covered under the battery manufacturing point source category

Appendix J—Metal Molding and Casting Flow Rates and Recycle Rates

Subcategory process segment	Applied flow rate [1]	Recycle rate	Blowdown flow rate [1]
Aluminium:			
Casting cleaning	480/240	95	24.0/12
Casting quench	145/72.5	98	2.90/1.45
Die casting	41.4/20.7	95	2.07/1.04
Dust collection scrubber	[2]1.78	98	[2]0.036
Grinding scrubber	[2]0.063	100	0
Investment casting	17,600/8,800	85	2,640/1,320
Melting furnace scrubber	[2]11.7	96	[2]0.468
Mold cooling	1,850/925	95	92.5/46.3
Copper:			
Casting quench	478/239	98	9.56/4.78
Direct chill casting	5,780/2,890	95	289/145
Dust collection scrubber	[2]4.29	98	[2]0.086
Grinding scrubber	[2]0.111	100	0
Investment casting	17,600/8,800	85	2,640/1,320
Melting furnace scrubber	[2]7.04	96	[2]0.282
Mold cooling	2,450/1,225	95	122/61.3
Ferrous:			
Casting cleaning	213/107	95	10.7/5.33 [2]
Casting quench	571/286	98	11.4/5.71
Dust collection scrubber	[2]3.0	97	0.090
Grinding scrubber	[3]3/17	100	0
Investment casting	17,600/8,800	85	2,640/1,320
Melting furnace scrubber	[2]10.5	96	[2]0.420
Mold cooling	707/354	95	35.4/17.7
Slag quench	727/364	94	43.6/21.8
Wet sand reclamation	[3]895/448	80	[3]179/89.5
Zinc:			
Casting quench	533/267	98	10.7/5.34
Die casting	41.4/20.7	95	2.07/1.04
Melting furnace scrubber	[2]6.07	96	[2]0.243
Mold cooling	1,890/945	95	94.5/47.3

[1] Applied and blowdown flow rates are in gallons per ton/gallons per 1,000 lbs of metal poured except as otherwise noted.
[2] Applied and blowdown flow rates in gallons per 1,000 SCF.
[3] Applied and blowdown flow rates are in gallons per ton/gallons per 1,000 lbs of sand reclaimed.

APPENDIX K.—METAL MOLDING AND CASTING TREATMENT EFFECTIVENESS CONCENTRATIONS LIME AND SETTLE

	Maximum day [1]	Maximum month [1]	Long-term average [1]
Ferrous subcategory:			
Copper	0.29	0.16	0.065
Lead	0.79	0.39	0.22
Zinc	1.47	0.56	0.40
Total phenols	0.86	0.30	0.20
Oil and grease	30	10	5
TSS	38	15	10
Nonferrous subcategories:			
Copper	0.77	0.42	0.17
Lead	0.79	0.39	0.22
Zinc	1.14	0.43	0.27
Total phenols	0.86	0.30	0.20
Oil and grease	30	10	5
TSS	38	15	10

[1] Concentration units are milligrams per litor (mg/l).

APPENDIX L.—METAL MOLDING AND CASTING TREATMENT EFFECTIVENESS CONCENTRATIONS LIME AND SETTLE, FILTRATION

	Maximum day [1]	Maximum month [1]	Long-term average [1]
Ferrous subcategory:			
Copper	0.29	0.16	0.065
Lead	0.53	0.26	0.15
Zinc	0.98	0.37	0.26
Total phenols	0.86	0.30	0.20
Oil and grease	30	10	5
TSS	15	12	2.6
Nonferrous subcategories:			
Copper	0.77	0.42	0.17
Lead	0.53	0.26	0.15
Zinc	0.76	0.29	0.18
Total phenols	0.86	0.30	0.20
Oil and grease	30	10	5
TSS	15	12	2.6

[1] Concentration units are milligrams per liter (mg/l).

APPENDIX M.—TOTAL TOXIC ORGANIC (TTO) CONCENTRATIONS FOR PSES AND PSNS MASS LIMITATIONS

Subcategory process segment	Maximum day [1]	Maximum month [1]	Long-term average [1]
Aluminum:			
Casting quench	2.42	0.788	0.394
Die casting	3.56	1.16	0.580
Dust collection scrubber	2.04	0.666	0.333
Investment casting	1.64	0.536	0.268
Melting furnace scrubber	2.04	0.666	0.333
Mold cooling	2.42	0.788	0.394
Copper:			
Casting quench	0.84	0.274	0.137
Dust collection scrubber	2.30	0.752	0.376
Investment casting	2.30	0.752	0.376
Melting furnace scrubber	2.30	0.752	0.376
Mold cooling	0.84	0.274	0.137
Ferrous:			
Casting quench	0.539	0.176	0.088
Dust collection scrubber	2.71	0.884	0.442
Investment casting	1.20	0.390	0.195
Melting furnace scrubber	2.38	0.778	0.389
Mold cooling	0.539	0.176	0.088
Slag quench	0.141	0.046	0.023
Wet sand reclamation	1.58	0.516	0.258
Zinc:			
Casting quench	2.08	0.68	0.340
Die casting	2.27	0.74	0.370
Melting furnace scrubber	1.95	0.636	0.318
Mold cooling	2.08	0.68	0.340

[1] Concentration units are milligrams per liter (mg/l).

Accordingly, Title 40, Chapter I, of the Code of Federal Regulations is amended by adding new Part 464 to read as set forth below:

PART 464—METAL MOLDING AND CASTING POINT SOURCE CATEGORY

General Provisions

Subpart A—Aluminum Casting Subcategory

Subpart B—Copper Casting Subcategory

Subpart C—Ferrous Casting Subcategory

Subpart D—Zinc Casting Subcategory

Authority: Secs. 301, 304 (b), (c), (e), and (g), 306 (b) and (c), 307, 308, and 501 of the Clean Water Act (Federal Water Pollution Control Act Amendments of 1972, as amended by the Clean Water Act of 1977) (the "Act"); 33 U.S.C. 1311, 1314 (b), (c), (e) and (g), 1316 (b) and (c), 1317 (b) and (c), 1318, and 1361; 86 Stat. 816, Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217.

General Provisions

§ 464.01 Applicability.

(a) This part applies to metal molding and casting facilities that discharge or may discharge pollutants to waters of the United States or that introduce pollutants into a publicly owned treatment works.

§ 464.02 General definitions.

In addition to the definitions set forth in 40 CFR Part 401, the following definitions apply to this part:

(a) *Aluminum Casting.* The remelting of aluminum or an aluminum alloy to form a cast intermediate or final product by pouring or forcing the molten metal into a mold, except for ingots, pigs, or other cast shapes related to nonferrous (primary and secondary) metals manufacturing (40 CFR Part 421) and aluminum forming (40 CFR Part 467).

Processing operations following the cooling of castings not covered under aluminum forming, except for grinding scrubber operations which are covered here, are covered under the electroplating and metal finishing point source categories (40 CFR Parts 413 and 433).

(b) *Copper Casting.* The remelting of copper or a copper alloy to form a cast intermediate or final product by pouring or forcing the molten metal into a mold, except for ingots, pigs, or other cast shapes related to nonferrous (primary and secondary) metals manufacturing (40 CFR Part 421). Also excluded are casting of beryllium alloys in which beryllium is present at 0.1 or greater percent by weight and precious metals alloys in which the precious metal is present at 30 or greater percent by weight. Except for grinding scrubber operations which are covered here, processing operations following the cooling of castings are covered under the electroplating and metal finishing point source categories (40 CFR Parts 413 and 433).

(c) *Ferrous Casting.* The remelting of ferrous metals to form a cast intermediate or finished product by pouring the molten metal into a mold. Except for grinding scrubber operations which are covered here, processing operations following the cooling of castings are covered under the electroplating and metal finishing point source categories (40 CFR Parts 413 and 433).

(d) *Zinc Casting.* The remelting of zinc or zinc alloy to form a cast intermediate or final product by pouring or forcing the molten metal into a mold, except for ingots, pigs, or other cast shapes related to nonferrous (primary) metals manufacturing (40 CFR Part 421) and nonferrous metals forming (40 CFR Part 471). Processing operations following the cooling of castings not covered under nonferrous metals forming are covered under the electroplating and metal finishing point source categories (40 CFR Parts 413 and 433).

(e) *POTW* shall mean "publicly owned treatment works."

(f) A *non-continuous discharger* is a plant which does not discharge pollutants during specific periods of time for reasons other than treatment plant upset, such periods being at least 24 hours in duration. A typical example of a non-continuous discharger is a plant where wastewaters are routinely stored for periods in excess of 24 hours to be treated on a batch basis. For non-continuous discharging direct discharging plants, NPDES permit authorities shall apply the mass-based annual average effluent limitations or standards and the concentration-based maximum day and maximum for monthly average effluent limitations or standards established in the regulations. POTWs may elect to establish concentration-based standards for non-continuous discharges to POTWs. They may do so by establishing concentration-based pretreatment standards equivalent to the mass-based standards provided in §§ 464.15, 464.16, 464.25, 464.26, 464.35, 464.36, 464.45, and 464.46 of the regulations. Equivalent concentration standards may be established by following the procedures outlined in Section 464.03(b).

(g) *Total Phenols* shall mean total phenolic compounds as measured by the procedure listed in 40 CFR Part 136 (distillation followed by colorimetric—4AAP).

(h) *Sm* [3] shall mean standard cubic meters.

(i) *SCF* shall means standard cubic feet.

(j) *Total Toxic Organics* (TTO) shall mean the sum of the mass of each of the toxic organic compounds which are found at a concentration greater than 0.010 mg/l. The specialized definitions for each subpart contain a discrete list of toxic organic compounds comprising TTO for each process segment in which TTO is regulated.

§ 464.03 Monitoring and reporting requirements.

(a) As an alternative to monitoring for TTO (total toxic organics), an indirect discharging plant may elect to monitor for Oil and Grease instead. Compliance with the Oil and Grease standard shall be considered equivalent to complying with the TTO standard. Alternate Oil and Grease standards are provided as substitutes for the TTO standards provided in §§ 464.15, 464.16, 464.25, 464.26, 464.35, 464.36, 464.45, and 464.46.

(b) POTWs may establish concentration standards rather than mass standards, but must ensure that the concentration standards are exactly equivalent to the mass-based standards provided in §§ 464.15, 464.16, 464.25, 464.26, 464.35, 464.36, 464.45, and 464.46. Equivalent concentration standards may be determined by multiplying the mass-based standards included in the regulations by an appropriate measurement of average production, raw material usage, or air scrubber flow (kkg of metal poured, kkg of sand reclaimed, or standard cubic meters of air scrubbed) and dividing by an appropriate measure of average discharge flow to the POTW, taking into account the proper conversion factors to ensure that the units (mg/l) are correct.

(c) The "monthly average" regulatory values shall be the basis for the monthly average effluent limitations guidelines and standards in direct discharge permits and for pretreatment standards. Compliance with the monthly average effluent limitations guidelines and standards is required regardless of the number of samples analyzed and averaged.

§ 464.04 Compliance date for PSES.

The compliance date of PSES is October 31, 1988.

Subpart A—Aluminum Casting Subcategory

§ 464.10 Applicability; description of the aluminum casting subcategory.

The provisions of this subpart are applicable to discharges to waters of the United States and to the introduction of pollutants into publicly owned treatment works resulting from aluminum casting operations as defined in § 464.02(a).

§ 464.11 Specialized definitions.

For the purpose of this subpart:

(a) *Total Toxic Organics (TTO).* TTO is a regulated parameter under PSES (§ 464.15) and PSNS (§ 464.16) for the aluminum subcategory and is comprised of a discrete list of toxic organic pollutants for each process segment where it is regulated, as follows:

(1) Casting Quench (§ 464.15(b) and § 464.16(b)):

4. benzene
21. 2,4,6-trichlorophenol
22. Para-chloro meta-cresol
23. chloroform (trichloromethane)
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride (dichloromethane)
65. phenol
66. bis(2-ethylhexyl)phthalate
67. butyl benzyl phthalate
84. pyrene
85. tetrachloroethylene
87. trichloroethylene

(2) Die Casting (§ 464.15(c) and § 464.16(c)):

1. acenaphthene
4. benzene
7. chlorobenzene
11. 1,1,1-trichloroethane
21. 2,4,6-trichlorophenol
22. para-chloro meta-cresol
23. chloroform (trichloromethane)
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride (dichloromethane)
55. naphthalene
65. phenol
66. bis(2-ethylhexyl)phthalate

67. butyl benzyl phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
72. benzo (a)anthracene (1,2-benzanthracene)
73. benzo (a)pyrene (3,4-benzopyrene)
76. chrysene
78. anthracene
80. fluorene
81. phenanthrene
84. pyrene
85. tetrachloroethylene
86. toluene

(3) Dust Collection Scrubber (§ 464.15(d) and § 464.16(d)):

1. acenaphthene
21. 2,4,6-trichlorophenol
23. chloroform (trichloromethane)
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride (dichloromethane)
65. phenol
66. bis (2-ethylhexyl) phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
73. benzo (a)pyrene (3,4-benzopyrene)
84. pyrene

(4) Investment Casting (§ 464.15(f) and § 464.16(f)):

11. 1,1,1-trichloroethane
23. chloroform (trichloromethane)
44. methylene chloride (dichloromethane)
66. bis (2-ethylhexyl) phthalate
84. pyrene
85. tetrachloroethylene
87. trichloroethylene

(5) Melting Furnace Scrubber (§ 464.15(g) and § 464.16(g)):

1. acenaphthene
21. 2,4,6-trichlorophenol
23. chloroform (trichloromethane)
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride (dichloromethane)
65. phenol
66. bis (2-ethylhexyl) phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
73. benzo (a)pyrene (3,4-benzopyrene)
84. pyrene

(6) Mold Cooling (§ 464.15(h) and § 464.16(h)):

4. benzene
21. 2,4,6-trichlorophenol
22. para-chloro meta-cresol
23. chloroform (trichloromethane)
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride
65. phenol
66. bis(2-ethylhexyl) phthalate
67. butyl benzyl phthalate
84. pyrene
85. tetrachloroethylene
87. trichloroethylene

§ 464.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available, except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent limitations for copper, lead, zinc, total phenols, oil and grease, and TSS. For non-continuous dischargers, annual average mass limitations and maximum day and maximum for monthly average concentration (mg/l) limitations shall apply. Concentration limitation and annual average mass limitation shall only apply to non-continuous dischargers.

(a) *Casting Cleaning Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0771	0.0421
Lead (T)	0.0791	0.039
Zinc (T)	0.114	0.0431
Oil & grease	3.0	1.0
TSS	3.80	1.50
pH	(1)	(1)

[1] Within the range of 7.0 to 10.00 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[2]	
Copper (T)	0.77	0.042	0.017
Lead (T)	0.79	0.39	0.022
Zinc (T)	1.14	0.43	0.027
Oil & grease	30	10	0.501
TSS	38	15	1.0
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (12/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(b) *Casting Quench Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0093	0.0051
Lead (T)	0.0096	0.0047
Zinc (T)	0.0138	0.0052
Oil & grease	0.363	0.121
TSS	0.46	0.182
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[2]	
Copper (T)	0.77	0.42	0.0021
Lead (T)	0.79	0.39	0.0027
Zinc (T)	1.14	0.43	0.0033
Oil & grease	30	10	0
TSS	38	15	0.121
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.45/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(c) *Die Casting Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0066	0.0036
Lead (T)	0.0068	0.0034
Zinc (T)	0.0098	0.0037
Total Phenols	0.0074	0.0026
Oil & Grease	0.259	0.0864
TSS	0.33	0.13
pH	(1)	(1)

[1] With the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0015
Lead (T)	0.79	0.39	0.0019
Zinc (T)	1.14	0.43	0.0023
Total Phenols	0.86	0.3	0.0017
Oil & Grease	30	10	0.0432
TSS	38	15	0.0864
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.04/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(d) *Dust Collection Scrubber Operations.*

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.231	0.126
Lead (T)	0.237	0.117
Zinc (T)	0.343	0.129
Total Phenols	0.258	0.09
Oil & Grease	9.01	3.0
TSS	11.4	4.51
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	mg/l) [2]	
Copper (T)	0.77	0.42	0.0511
Lead (T)	0.79	0.39	0.0661
Zinc (T)	1.14	0.43	0.0811
Total Phenols	0.86	0.3	0.0601
Oil & Grease	30	10	1.5
TSS	38	15	3.0
pH	(3)	(3)	(3)

[1] kg/62.3 million SM^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.036/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(e) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to navigable waters.

(f) *Investment Casting.*

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	8.7	4.3
Zinc (T)	12.6	4.74
Oil and grease	330	110
TSS	419	165
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	1.87
Lead (T)	0.79	0.39	2.42
Zinc (T)	1.14	0.43	2.97
Oil and grease	30	10	55.1
TSS	38	15	110
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(g) *Melting Furnace Scrubber Operations.*

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	3.01	1.64
Lead (T)	3.09	1.52
Zinc (T)	4.45	1.68
Total phenols	3.36	1.17
Oil and grease	117	39.1
TSS	148	58.6
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [3]	
Copper (T)	0.47	0.42	0.664
Lead (T)	0.79	0.39	0.859
Zinc (T)	1.14	0.43	1.05
Total phenols	0.86	0.3	0.781
Oil and grease	30	10	19.5
TSS	38	15	39.1
pH	(2)	(3)	(3)

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.468/x) where x is the acutal normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(h) *Mold Cooling Operations.*

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.297	0.162
Lead (T)	0.305	0.151
Zinc (T)	0.44	0.166
Oil and grease	11.6	3.86
TSS	14.7	5.79
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [1]	(mg/) [1]	
Copper (T)	0.77	0.42	0.0656
Lead (T)	0.79	0.39	0.0849
Zinc (T)	1.14	0.43	0.104
Oil and grease	30	10	1.93
TSS	38	15	3.96
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal
[2] These concentrations must be multiplied by the ratio of (46.3/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

§ 464.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable, except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/62.3 million Sm^3 or lb/billion SOF of air scrubbed) effluent limitations for copper, lead, zinc, and total phenols. For non-continuous dischargers, annual average mass limitations and maximum day and maximum for monthly average concentration (mg/l) limitations shall apply. Concentration limitations and annual average mass limitations shall only apply to non-continuous dischargers.

(a) *Casting Cleaning Operations.*

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.771	0.0421
Lead (T)	0.0791	0.039
Zinc (T)	0.114	0.0431

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.017
Lead (T)	0.79	0.39	0.022
Zinc (T)	1.14	0.43	0.027

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (12/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(b) *Casting Quench Operations.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0099	0.0051
Lead (T)	0.0096	0.0047
Zinc (T)	0.0138	0.0052

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0021
Lead (T)	0.79	0.39	0.0027
Zinc (T)	1.14	0.43	0.0033

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.45/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(c) *Die Casting Operations.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0066	0.0036
Lead (T)	0.0068	0.0034
Zinc (T)	0.0098	0.0037
Total Phenols	0.0074	0.0026

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0015
Lead (T)	0.79	0.39	0.0019
Zinc (T)	1.14	0.43	0.0023
Total Phenols	0.86	0.3	0.0017

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.04/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(d) *Dust Collection Scrubber Operations.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.231	0.126
Lead (T)	0.237	0.117
Zinc (T)	0.343	0.129
Total Phenols	0.258	0.09

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0511
Lead (T)	0.79	0.39	0.0661
Zinc (T)	1.14	0.43	0.0811
Total Phenols	0.86	0.3	0.0601

[1] kg/62.3 million Sm^3 (lb per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.036/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(e) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to navigable waters.

(f) *Investment Casting.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	8.7	4.3
Zinc (T)	12.6	4.74

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	1.87
Lead (T)	0.79	0.39	2.42
Zinc (T)	1.14	0.43	2.97

[1] kg/1,000 kkg pounds per million pounds of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(g) *Melting Furnace Scrubber Operations.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	3.01	1.64
Lead (T)	3.09	1.52
Zinc (T)	4.45	1.68
Total phenols	3.36	1.17

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.664
Lead (T)	0.79	0.39	0.859
Zinc (T)	1.14	0.43	1.05
Total phenols	0.86	0.3	0.781

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.468/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(h) *Mold Cooling Operations.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.297	0.162
Lead (T)	0.305	0.151
Zinc (T)	0.44	0.166

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0656
Lead (T)	0.79	0.39	0.0849
Zinc (T)	1.14	0.43	0.104

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (46.3/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

§ 464.14 New source performance standards.

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent standards for copper, lead, zinc, total phenols, oil and grease, and TSS. For non-continuous dischargers, annual average mass standards and maximum day and maximum for monthly average concentration (mg/l) standards shall apply. Concentration standards and annual average mass standards shall only apply to non-continuous dischargers.

(a) *Casting Cleaning Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0771	0.0421
Lead (T)	0.0791	0.039
Zinc (T)	0.114	0.0431
Oil and grease	3.0	1.0
TSS	3.8	1.5
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.017
Lead (T)	0.79	0.39	0.022
Zinc (T)	1.14	0.43	0.027
Oil and grease	30	10	0.501
TSS	38	15	1.0
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (12/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(b) *Casting Quench Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0093	0.0051
Lead (T)	0.0098	0.0047
Zinc (T)	0.0138	0.0052
Oil and grease	0.363	0.121
TSS	0.46	0.182
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0021
Lead (T)	0.79	0.39	0.0027
Zinc (T)	1.14	0.43	0.0033
Oil and grease	30	10	0.0605
TSS	38	15	0.121

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
pH	([3])	([3])	([3])

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.45/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(c) *Die Casting Operations.*

NSPS

Pollutant or pollutant property	Maximum for one 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds of metal poured	
Copper (T)	0.0066	0.0036
Lead (T)	0.0068	0.0034
Zinc (T)	0.0098	0.0037
Total Phenols	0.0074	0.0026
Oil and grease	0.259	0.0864
TSS and	0.33	0.13
pH	([1])	([1])

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0015
Lead (T)	0.79	0.39	0.0019
Zinc (T)	1.14	0.43	0.0023
Total phenols	0.86	0.3	0.0017
Oil and grease	30	10	0.0432
TSS and	38	15	0.0864
pH	([3])	([3])	([3])

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.04/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured)
[3] Within the range of 7.0 to 10.0 at all times.

(d) *Dust Collection Scrubber Operations.*

NSPS

Pollutant of pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm [3] (pounds per billion SCF) of air scrubbed	
Cooper (T)	0.231	0.126
Lead (T)	0.237	0.117
Zinc (T)	0.343	0.129
Total phenols	0.258	0.09
Oil and grease	9.01	3.0
TSS	11.4	4.51
pH	([1])	([1])

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Cooper (T)	0.77	0.42	0.0511
Lead (T)	0.79	0.39	0.0661
Zinc (T)	1.14	0.43	0.0811
Total phenols	0.86	0.3	0.0601
Oil and grease	30	10	1.5
TSS	38	15	3.0

	Maximum for any 1 day	maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
pH	([3])	([3])	([3])

[1] kg/62.3 million Sm [3] (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.036/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(e) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to navigable waters.

(f) *Investment Casting*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	8.7	4.3
Zinc (T)	12.6	4.74
Oil and grease	300	110
TSS	419	165
pH	([1])	([1])

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	1.87
Lead (T)	0.79	0.39	2.42
Zinc (T)	1.14	0.43	2.97
Oil and grease	30	10	55.1
TSS	38	15	110
pH	([3])	([3])	([3])

[1] kg/1,000 kkg (pounds per million pounds) of metal poured
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(g) *Melting Furnace Scrubber Operations*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm [3] (pounds per billion SCF) of air scrubbed	
Copper (T)	3.01	1.64
Lead (T)	3.09	1.52
Zinc (T)	4.45	1.68
Total phenols	3.36	1.17
Oil and grease	117	39.1
TSS	148	58.6
pH	([1])	([1])

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.664
Lead (T)	0.79	0.39	0.859
Zinc (T)	1.14	0.43	1.05
Total phenols	0.86	0.3	0.781

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Oil and grease	30	10	19.5
TSS	38	15	39.1
pH	([3])	([3])	([3])

[1] (kg/62.3 million Sm [3] (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.468/x) where x is the actual normalized process wastewater flow (in gallowns per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(h) *Mold Cooling Operations*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.297	0.162
Lead (T)	0.305	0.151
Zinc (T)	0.44	0.166
Oil and grease	11.6	3.86
TSS	14.7	5.79
pH	([1])	([1])

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0656
Lead (T)	0.79	0.39	0.0849
Zinc (T)	1.14	0.43	0.104
Oil and grease	30	10	1.93
TSS	38	15	3.86
pH	([3])	([3])	([3])

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (46.3/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

§ 464.15 Pretreatment standards for existing sources.

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources.

(a) *Casting Cleaning Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0771	0.0421
Lead (T)	0.0791	0.039
Zinc (T)	0.114	0.0431

(b) *Casting Quench Operation.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0093	0.0051
Lead (T)	0.0096	0.0047
Zinc (T)	0.0138	0.0052
TTO	0.029	0.0095
Oil and grease (for alternate monitoring)	0.363	0.121

(c) *Die Casting Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0066	0.0036
Lead (T)	0.0068	0.0034
Zinc (T)	0.0098	0.0037
Total phenols	0.0074	0.0026
TTO	0.0308	0.01
Oil and grease (for alternate monitoring	0.259	0.0864

(d) *Dust Collection Scrubber Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) or air scrubbed	
Copper (T)	0.231	0.126
Lead (T)	0.237	0.0117
Zinc (T)	0.343	0.129
Total phenols	0.258	0.09
TTO	0.613	0.2
Oil and grease (for alternate monitoring	9.01	3.00

(e) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to a POTW.

(f) *Investment Casting*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	8.7	4.3
Zinc (T)	12.6	4.74
TTO	18.1	5.91
Oil and grease (for alternate monitoring	330	110

(g) *Melting Furnace Scrubber Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	3.01	1.64
Lead (T)	3.09	1.52
Zinc (T)	4.45	1.68
Total phenols	3.36	1.17
TTO	7.97	2.6
Oil and grease (for alternate monitoring)	117	39.1

(h) *Mold Cooling Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.297	0.162
Lead (T)	0.305	0.151
Zinc (T)	0.44	0.166
TTO	0.935	0.304
Oil and grease (for alternate monitoring)	11.6	3.86

§ 464.16 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources.

(a) *Casting Cleaning Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0771	0.0421
Lead (T)	0.0791	0.039
Zinc (T)	0.114	0.0431

(b) *Casting Quench Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0093	0.0051
Lead (T)	0.0096	0.0047
Zinc (T)	0.0138	0.0052
TTO	0.029	0.0095
Oil and grease (for alternate monitoring)	0.363	0.121

(c) *Die Casting Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0066	0.0036
Lead (T)	0.0068	0.0034
Zinc (T)	0.0098	0.0037
Total Phenols	0.0074	0.0026
TTO	0.0308	0.01
Oil and grease (for alternate monitoring)	0.259	0.0864

(d) *Dust Collection Scrubber Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.231	0.126
Lead (T)	0.237	0.117
Zinc (T)	0.343	0.129
Total Phenols	0.258	0.09
TTO	0.613	0.2
Oil and grease (for alternate monitoring)	9.01	3.0

(e) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to a POTW.

(f) *Investment Casting.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	8.7	4.3
Zinc (T)	12.6	4.74
TTO	18.1	5.91
Oil and grease (for alternate monitoring)	330	110

(g) *Melting Furnace Scrubber Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	3.01	1.64
Lead (T)	3.09	1.52
Zinc (T)	4.45	1.68
Total Phenols	3.36	1.17
TTO	7.97	2.6
Oil and grease (for alternate monitoring)	117	39.1

(h) *Mold Cooling Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.297	0.162
Lead (T)	0.305	0.151
Zinc (T)	0.44	0.166
TTO	0.935	0.304
Oil and grease (for alternate monitoring)	11.6	3.66

§ 464.17 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology. [Reserved].

Subpart B—Copper Casting Subcategory

§ 464.20 Applicability; description of the copper casting subcategory.

The provisions of this subpart are applicable to discharges to waters of the United States and to the introduction of pollutants into publicly owned treatment works resulting from copper casting operations as defined in § 464.02(b).

§ 464.21 Specialized definitions.

For the purpose of this subpart:

(a) *Total Toxic Organics (TTO).* TTO is a regulated parameter under PSES (§ 464.25) and PSNS (§ 464.26) for the copper subcategory and is comprised of a discrete list of toxic organic pollutants for each process segment where it is regulated, as follows:

(1) Casting Quench (§ 464.25(a) and § 464.26(a)):
23. chloroform (trichloromethane)
64. pentachlorophenol
66. bis(2-ethylhexyl)phthalate
71. dimethyl phthalate

(2) Dust Collection Scrubbers (§ 464.25(c) and 464.26(c)):
1. acenaphthene
22. para-chloro meta-cresol
23. chloroform (trichloromethane)
34. 2,4-dimethylphenol
55. naphthalene
58. 4-nitrophenol
64. pentachlorophenol
65. phenol
66. bis(2-ethylhexyl)phthalate
67. butyl benzyl phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
71. dimethyl phthalate
72. benzo(a)anthracene (1,2-benzanthracene)
74. 3,4-benzofluoranthene
75. benzo(k) fluoranthene
76. chrysene
77. acenaphthylene
78. anthracene
81. phenanthrene
84. pyrene

(3) Investment Casting (§ 464.25(e) and § 464.26(e)):
1. acenaphthene
22. para-chloro meta-cresol
23. chloroform (trichloromethane)
34. 2,4-dimethylphenol
55. naphthalene
58. 4-nitrophenol
64. pentachlorophenol
65. phenol
66. bis (2-ethylhexyl)phthalate
67. butyl benzyl phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
71. dimethyl phthalate
72. benzo(a)anthracene (1,2-benzanthracene)
74. 3,4-benzofluoranthene
75. benzo(k) fluoranthene
76. chrysene
77. acenaphthylene
78. anthracene
81. Phenanthrene
84. pyrene

(4) Melting Furnace Scrubber (§ 464.25(f) and § 464.26(f)):
1. acenaphthene
22. para-chloro meta-cresol
23. chloroform (trichloromethane)
34. 2,4-dimethylphenol
55. naphthalene
58. 4-nitrophenol
64. pentachlorophenol
65. phenol
66. bis (2-ethylhexyl) phthalate
67. butyl benzyl phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
71. dimethyl phthalate
72. benzo(a)anthracene (1,2-benzanthracene)
74. 3,4-benzoflouranthene
75. benzo(k) flouranthene
76. chrysene
77. acenaphthylene
78. anthracene
81. phenanthrene
84. pyrene

(5) Mold Cooling (§ 464.25(g) and § 464.26(g)):
23. chloroform (trichloromethane)
64. pentachlorophenol
66. bis(2-ethylhexyl)phthalate
71. dimethyl phthalate

§ 464.22 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

Except as provided in 40 CFR 125.30—125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available, except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent limitations for copper, lead, zinc, total phenols, oil and grease, and TSS. For non-continuous dischargers, annual average mass limitations and maximum day and maximum for monthly average concentration (mg/l) limitations shall apply. Concentration limitations and annual average mass limitations shall only apply to non-continuous dischargers.

(a) *Casting Quench Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0307	0.0168
Lead (T)	0.0315	0.0156
Zinc (T)	0.0455	0.0171
Oil and grease	1.2	0.399
TSS	1.52	0.598
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0068
Lead (T)	0.79	0.39	0.0088
Zinc (T)	1.14	0.43	0.0108
Oil and grease	30	10	0.199
TSS	38	15	0.399
pH	(3)	(3)	(3)

[1] kg/1000 kkg (pounds per million pounds) of metal poured
[2] These concentrations must be multiplied by the ratio of (4.8/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(b) *Direct Chill Casting Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.928	0.506
Lead (T)	0.952	0.47
Zinc (T)	1.37	0.518
Oil and grease	36.2	12.1
TSS	45.6	18.1
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.205
Lead (T)	0.79	0.39	0.265
Zinc (T)	1.14	0.43	0.326

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Oil and grease	30	10	6.03
TSS	38	15	12.1
pH	([3])	([3])	([3])

[1] kg/1000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (145/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(a) *Dust Collection Scrubber Operations*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.553	0.301
Lead (T)	0.567	0.28
Zinc (T)	0.818	0.309
Total phenols	0.617	0.215
Oil and grease	21.5	7.18
TSS	27.3	10.8
ph	([1])	([1])

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.122
Lead (T)	0.79	0.39	0.158
Zinc (T)	1.14	0.43	0.194
Total phenols	0.86	0.3	0.144
Oil and grease	30	10	3.59
TSS	38	15	7.18
pH	([3])	([3])	([3])

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.086/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to navigable waters.

(e) *Investment Casting.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	8.7	4.3
Zinc (T)	12.6	4.74
Oil and grease	330	110
TTS	419	165
Ph	([1])	([1])

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	1.87
Lead (T)	0.79	0.39	2.42
Zinc (T)	1.14	0.43	2.97
Oil and grease	30	10	55.1
TSS	38	15	110
pH	([3])	([3])	([3])

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(f) *Melting Furnace Scrubber Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.81	0.988
Lead (T)	1.86	0.918
Zinc (T)	2.68	1.01
Total phenols	2.02	0.706
Oil and grease	70.6	23.5
TSS	89.4	35.3
pH	([1])	([1])

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.4
Lead (T)	0.79	0.39	0.518
Zinc (T)	1.14	0.43	0.635
Total phenols	0.86	0.3	0.467
Oil and grease	30	10	11.7
TSS	38	15	23.5
pH	([3])	([3])	([3])

[1] kg/62.3 million Sm^3 (pound per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.282/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(g) *Mold Cooling Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds million pounds) of metal poured	
Copper (T)	0.392	0.214
Lead (T)	0.402	0.199
Zinc (T)	0.58	0.219
Oil and grease	15.3	5.09
TSS	19.3	7.63
pH	([1])	([1])

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0865
Lead (T)	0.79	0.39	0.112
Zinc (T)	1.14	0.43	0.137
Oil and grease	30	10	2.54
TSS	38	15	5.09
pH	([3])	([3])	([3])

[1] kg/1000 kkg pounds per million pounds of metal poured.
[2] These concentrations must be multiplied by the ratio of (61/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

§ 464.23 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable, except that non-continuous dischargers shall not be suject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent limitations for copper, lead, zinc, and total phenols. For non-continuous discharges, annual average mass limitations and maximum day and maximum for monthly average concentration (mg/l) limitations shall apply. Concentration limitations and annual average mass limitations shall only apply to non-continuous dischargers.

(a) *Casting Quench Operations.*

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0307	.0168
Lead (T)	0.0211	.0104
Zinc (T)	0.0303	.0116

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0068
Lead (T)	0.53	0.26	0.006
Zinc (T)	0.76	0.29	0.0072

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (4.8/x) where x is the actual normalized process waste-water flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(b) *Direct Chill Casting Operations.*

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.928	0.506
Lead (T)	0.639	0.314
Zinc (T)	0.916	0.35

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[2]	
Copper (T)	0.77	0.42	0.205
Lead (T)	0.53	0.26	0.181
Zinc (T)	0.76	0.29	0.217

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (145/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(c) *Dust Collection Scrubber Operations.*

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.553	0.301
Lead (T)	0.38	0.187
Zinc (T)	0.545	0.208
Total phenols	0.617	0.215

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[2]	
Copper (T)	0.77	0.42	0.122
Lead (T)	0.53	0.26	0.108
Zinc (T)	0.76	0.29	0.129
Total phenols	0.86	0.3	0.144

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed
[2] These concentrations must be multiplied by the ratio of (0.086/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to navigable waters.

(e) *Investment Casting.*

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1000 kkg (pounds per million pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	5.84	2.86
Zinc (T)	8.37	3.19

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[2]	
Copper (T)	0.77	0.42	1.87
Lead (T)	0.53	0.26	1.65
Zinc (T)	0.76	0.29	1.98

[1] kg/1000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(f) *Melting Furnace Scrubber Operations.*

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.81	0.988
Lead (T)	1.25	0.612
Zinc (T)	1.79	0.673
Total phenols	2.02	0.706

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[2]	
Copper (T)	0.77	0.42	0.4
Lead (T)	0.53	0.26	0.353
Zinc (T)	0.76	0.29	0.424
Total phenols	0.86	0.3	0.471

[1] kg/62.3 million Sm^3 (pounds per billion SCR) or air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.282/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(g) *Mold Cooling Operations.*

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.392	0.214
Lead (T)	0.27	0.132
Zinc (T)	0.387	0.148

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	kg/1,000 kkg pounds per million pounds of metal poured		
	(mg/l)[2]	(mg/l)[2]	
Copper (T)	0.77	0.42	0.0865
Lead (T)	0.53	0.26	0.0763
Zinc (T)	0.76	0.29	0.0916

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (61/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

§ 464.24 New source performance standards.

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent standards for copper, lead, zinc, total phenols, oil and grease, and TSS. For non-continuous dischargers, annual average mass standards and maximum day and maximum for monthly average concentration (mg/l) standards shall apply. Concentration standards and annual average mass standards shall only apply to non-continuous dischargers.

(a) *Casting Quench Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0307	0.0168
Lead (T)	0.0211	0.0104
Zinc (T)	0.0303	0.0116
Oil and grease	1.2	0.399
TSS	0.598	0.479
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[2]	
Copper (T)	0.77	0.42	0.068
Lead (T)	0.53	0.26	0.006
Zinc (T)	0.76	0.29	0.0072
Oil and grease	30	10	0.199
TSS	15	12	0.104
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds of metal poured.
[2] These concentrations must be multiplied by the ratio of (4.8/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(b) *Direct Chill Casting Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.928	0.506
Lead (T)	0.639	0.314
Zinc (T)	0.916	0.35
Oil and grease	36.2	12.1
TSS	18.1	14.5
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.205
Lead (T)	0.53	0.26	0.181
Zinc (T)	0.76	0.29	0.217
Oil and grease	30	10	6.03
TSS	15	12	3.13
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds of metal poured.
[2] These concentrations must be multiplied by the ratio of (145/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(c) *Dust Collection Scrubber Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.553	0.301
Lead (T)	0.38	0.187
Zinc (T)	0.545	0.208
Total phenols	0.617	0.215
Oil and grease	21.5	7.18
TSS	10.8	8.61
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.122
Lead (T)	0.53	0.26	0.108
Zinc (T)	0.76	0.29	0.129
Total phenols	0.86	0.3	0.144
Oil and grease	30	10	3.59
TSS	15	12	1.87
pH	[3]	[3]	[3]

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.086/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to navigable waters.

(e) *Investment Casting.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per millions pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	5.84	2.86
Zinc (T)	8.37	3.19
Oil and grease	330	110
TSS	165	132
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	mg/l) [2]	
Copper (T)	0.77	0.42	1.87
Lead (T)	0.53	0.26	1.65
Zinc (T)	0.76	0.29	1.98
Oil and grease	30	10	55.1
TSS	15	12	28.6
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(f) *Melting Furnace Scrubber Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.81	0.988
Lead (T)	1.25	0.612
Zinc (T)	1.79	0.673
Total phenols	2.02	0.706
Oil and grease	70.6	23.5
TSS	35.3	28.2
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.4
Lead (T)	0.53	0.26	0.353
Zinc (T)	0.76	0.29	0.424
Total phenols	0.86	0.3	0.471
Oil and grease	30	10	11.8
TSS	15	12	6.12
pH	[3]	[3]	[3]

[1] kg/62.3 million Sm^3 pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.282/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(g) *Mold Cooling Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg pounds per million pounds of metal poured	
Copper (T)	0.392	0.214
Lead (T)	0.27	0.132
Zinc (T)	0.387	0.148
Oil and grease	15.3	5.09
TSS	7.63	6.11
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/1) [2]	(mg/1) [2]	
Copper (T)	0.77	0.42	0.0865
Lead (T)	0.53	0.26	0.0763
Zinc (T)	0.76	0.29	0.0916
Oil and grease	30	10	2.54
TSS	15	12	1.32
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pound) of metal poured.
[2] These concentrations must be multiplied by the ratio of (61/x) where x is the actual normalized process waste-water flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

§ 464.25 Pretreatment standards for existing sources.

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources.

(a) *Casting Quench Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0307	0.0168
Lead (T)	0.0211	0.0104
Zinc (T)	0.0303	0.0116
TTO	0.0335	0.0109
Oil and grease (for alternate monitoring)	1.2	0.399

(b) *Direct Chill Casting Operations*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.928	0.506
Lead (T)	0.639	0.314
Zinc (T)	0.916	0.35

(c) *Dust Collection Scrubber Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.552	0.301
Lead (T)	0.38	0.187
Zinc (T)	0.545	0.208
Total phenols	0.617	0.215
TTO	1.65	0.54

PSES—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Oil and grease (for alternate monitoring)	21.5	7.18

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to a POTW.

(e) *Investment Casting.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	5.84	2.86
Zinc (T)	8.37	3.19
TTO	25.4	8.29
Oil and grease for alternate monitoring)	330	110

(f) *Melting Furnace Scrubber Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.81	0.988
Lead (T)	1.25	0.612
Zinc (T)	1.79	0.673
Total phenols	2.02	0.706
TTO	5.41	1.77
Oil and grease (for alternate monitoring)	70.6	23.5

(g) *Mold Cooling Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.392	0.214
Lead (T)	0.27	0.132
Zinc (T)	0.387	0.148
TTO	0.428	0.14
Oil and grease (for alternate monitoring)	15.3	5.09

§ 464.26 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources.

(a) *Casting Quench Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0307	0.0168
Lead (T)	0.0211	0.0104
Zinc (T)	0.0303	0.0116
TTO	0.0335	0.0109
Oil and grease (for alternate monitoring)	1.2	0.399

(b) *Direct Chill Casting Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.928	0.506
Lead (T)	0.639	0.314
Zinc (T)	0.916	0.35

(c) *Dust Collection Scrubber Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 Million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.552	0.301
Lead (T)	0.38	0.187
Zinc (T)	0.545	0.208
Total Phenols	0.617	0.215
TTO	1.65	0.54
Oil and Grease (for alternate monitoring	21.5	7.18

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to a POTW.

(e) *Investment Casting.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	8.48	4.63
Lead (T)	5.84	2.86
Zinc (T)	8.37	3.19
TTO	25.4	8.29
Oil and Grease (for alternate monitoring	330	110

(f) *Melting Furnace Scrubber Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.81	0.988
Lead (T)	1.25	0.612
Zinc (T)	1.79	0.673
Total Phenols	2.02	0.706
TTO	5.41	1.77
Oil and Grease (for alternate monitoring	70.6	23.5

(g) *Mold Cooling Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.392	0.214
Lead (T)	0.27	0.132
Zinc (T)	0.387	0.148
TTO	0.428	0.14
Oil and Grease (for alternate monitoring	15.3	5.09

§ 464.27 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology. [Reserved].

Subpart C—Ferrous Casting Subcategory

§ 464.30 Applicability; description of the ferrous casting subcategory.

The provisions of this subpart are applicable to discharges to waters of the United States and to the introduction of pollutants into publicly owned treatment works resulting from ferrous casting operations as defined in § 464.02(c).

§ 464.31 Specialized definitions.

For the purpose of this subpart:

(a) *Total Toxic Organics (TTO).* TTO is a regulated parameter under PSES (§ 464.35) and PSNS (§ 464.36) for the ferrous subcategory and is comprised of a discrete list of toxic organic pollutants for each process segment where it is regulated, as follows:

(1) Casting Quench (§ 464.35(b) and § 464.36(b)):

23. chloroform (trichloromethane)
34. 2,4-dimethylphenol

(2) Dust Collection Scrubber (§ 464.35(c) and § 464.36(b)):

1. acenaphthene
23. chloroform (trichloromethane)
31. 2,4-dichlorophenol
34. 2,4-dimethylphenol
39. fluoranthene

44. methylene chloride (dichloromethane)
55. naphthalene
64. pentachlorophenol
65. phenol
66. bis(2-ethylhexyl)phthalate
67. butyl benzyl phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
71. dimethyl phthalate
72. benzo (a)anthracene (1,2-benzanthracene)
76. chrysene
77. acenaphthylene
78. anthracene
80. fluorene
81. phenanthrene
84. pyrene

(3) Investment Casting (§ 464.35(e) and § 464.36(e)):

23. chloroform (trichloromethane)
44. methylene chloride (dichloromethane)
66. bis (2-ethylhexyl) phthalate
77. acenaphthylene
84. pyrene

(4) Melting Furnace Scrubber (§ 464.35(f) and § 464.36(f)):

23. chloroform (trichloromethane)
31. 2,4-dichlorophenol
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride (dichloromethane)
55. naphthalene
65. phenol
66. bis (2-ethylhexyl) phthalate
67. butyl benzyl phthalate
68. di-n-butyl phthalate
72. benzo (a)anthracene (1,2-benzanthracene)
76. chrysene
77. acenaphthylene
78. anthracene
80. fluorene
81. phenanthrene
84. pyrene

(5) Mold Cooling (§ 464.35(g) and § 464.36(g)):

23. chloroform (trichloromethane)
34. 2,4-dimethylphenol

(6) Slag Quench (§ 464.35(h) and § 464.36(h)):

34. 2,4-dimethylphenol
71. dimethyl phthalate

(7) Wet Sand Reclamation (§ 464.35(i) and § 464.36(i)):

1. acenaphthene
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride (dichloromethane)
55. naphthalene
65. phenol
66. bis (2-ethylhexyl) phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
71. dimethyl phthalate
72. benzo(a)anthracene (1.2-benzanthracene)
77. acenaphthylene
84. pyrene

(b) *Cast Iron.* An iron containing carbon in excess of the solubility in the austentite that exists in the alloy at the eutectic temperature. Cast iron also is defined here to include any iron-carbon alloys containing 1.2 percent or more carbon by weight.

(c) *Ductile Iron.* A cast iron that has been treated while molten with a master alloy containing an element such as magnesium or cerium to induce the formation of free graphite as nodules or spherules, which imparts a measurable degree of ductility to the cast metal.

(d) *Gray Iron.* A cast iron that gives a gray fracture due to the presence of flake graphite.

(e) *Malleable Iron.* A cast iron made by a prolonged anneal of white cast iron in which decarburization or graphitization, or both, take place to eliminate some or all of the cementite. Graphite is present in the form of temper carbon.

(f) *Steel.* An iron-base alloy containing carbon, manganese, and often other alloying elements. Steel is defined here to include only those iron-carbon alloys containing less than 1.2 percent carbon by weight.

(g) The "primary metal cast" shall mean the metal that is poured in the greatest quantity at an individual plant.

(h) *Multiple Ferrous Melting Furnace Scrubber Configuration.* A multiple ferrous melting furnace scrubber configuration is a configuration where two or more discrete wet scrubbing devices are employed in series in a single melting furnace exhaust gas stream. The ferrous melting furnace scrubber mass allowance shall be given to each discrete wet scrubbing device that has an associated wastewater discharge in a multiple ferrous melting furnace scrubber configuration. The mass allowance for each discrete wet scrubber shall be identical and based on the air flow of the exhaust gas stream that passes through the multiple scrubber configuration.

(i) *Discrete Wet Scrubbing Device.* A discrete wet scrubbing device is a distinct, stand-alone device that removes particulates and fumes from a contaminated gas stream by bringing the gas stream into contact with a scrubber liquor, usually water, and from which there is a wastewater discharge. Examples of discrete wet scrubbing devices are: Spray towers and chambers, venturi scrubbers (fixed and variable), wet caps, packed bed scrubbers, quenchers, and orifice scrubbers. Semi-wet scrubbing devices where water is added and totally evaporates prior to dry air pollution control are not considered to be discrete wet scrubbing devices. Ancillary scrubber operations such as fan washes and backwashes are not considered to be discrete wet scrubber devices. These ancillary operations are covered by the mass limitations of the associated scrubber. Aftercoolers are not considered to be discrete wet scrubbing devices, and water discharges from aftercooling are not regulated as a process wastewater in this category.

§ 464.32 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

Except as provided in 40 CFR 125.30—125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available, except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/1,000 kkg or lb/million lb of sand reclaimed; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent limitations for copper, lead, zinc, total phenols, oil and grease, and TSS. For non-continuous dischargers, annual average mass limitations and maximum day and maximum for monthly average concentration (mg/l) limitations shall apply. Concentration limitations and annual average mass limitations shall only apply to non-continuous dischargers.

(a) *Casting Cleaning Operations*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0129	0.0071
Lead (T)	0.0353	0.0174
Zinc (T)	0.0656	0.025
Oil and grease	1.34	0.446
TSS	1.7	0.67
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [4]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0029
Lead (T)	0.79	0.39	0.0098
Zinc (T)	1.47	0.56	0.0179
Oil and grease	30	10	0.223
TSS	38	15	0.446
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.35/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(b) *Casting Quench Operations*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0138	0.0076
Lead (T)	0.0376	0.0185
Zinc (T)	0.0699	0.0266
Oil and grease	1.43	0.476
TSS	1.81	0.713
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0031
Lead (T)	0.79	0.39	0.0105
Zinc (T)	1.47	0.56	0.019
Oil and grease	30	10	0.238
TSS	38	15	0.476
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.7/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(c) *Dust Collection Scrubber Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.218	0.12
Lead (T)	0.593	0.293
Zinc (T)	1.1	0.421
Total phenols	0.656	0.225
Oil and grease	22.5	7.51
TSS	28.5	11.3
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	(mg/l) [2]
Copper (T)	0.29	0.16	0.0488
Lead (T)	0.79	0.39	0.165
Zinc (T)	1.47	0.56	0.3
Total phenols	0.86	0.3	0.15
Oil and grease	30	10	3.76
TSS	38	15	7.51
pH	[3]	[3]	[3]

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.039/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to navigable waters.

(e) *Investment Casting.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	3.19	1.76
Lead (T)	8.7	4.3
Zinc (T)	16.2	6.17
Oil and grease	330	110
TSS	419	165
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.716
Lead (T)	0.79	0.39	2.42
Zinc (T)	1.47	0.56	4.41
Oil and grease	30	10	55.1
TSS	38	15	110
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(f) *Melting Furnace Scrubber Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.02	0.561
Lead (T)	2.77	1.37
Zinc (T)	5.15	1.96
Total phenols	3.01	1.05
Oil and grease	105	35
TSS	133	52.6
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.228
Lead (T)	0.79	0.39	0.771
Zinc (T)	1.47	0.56	1.4
Total phenols	0.86	0.3	0.701
Oil and grease	30	10	17.5
TSS	38	15	35
pH	[3]	[3]	[3]

[1] kg/62.3 million Sm^3 (pounds per billion SCF) or air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.42/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(g) *Mold Cooling Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0428	0.0236
Lead (T)	0.117	0.0576
Zinc (T)	0.217	0.0827
Oil and grease	4.43	1.48
TSS	5.61	2.22
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0096
Lead (T)	0.79	0.39	0.0325
Zinc (T)	1.47	0.56	0.0591
Oil and grease	30	10	0.738
TSS	38	15	1.48
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds) of metal poured
[2] These concentrations must be multiplied by the ratio of (17.7/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(h) *Slag Quench Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Cooper (T)	0.0527	0.0291
Lead (T)	0.144	0.0709
Zinc (T)	0.267	0.102
Oil and grease	5.46	1.82
TSS	6.91	2.73
pH	[1]	[1]

[1] Within the range 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0118
Lead (T)	0.79	0.39	0.04
Zinc (T)	1.47	0.56	0.0728
Oil and grease	30	10	0.909
TSS	38	15	1.82
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (21.8/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(i) *Wet Sand Reclamation Operations.*

BPT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of sand reclaimed	
Cooper (T)	0.217	0.12

BPT EFFLUENT LIMITATIONS—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Lead (T)	0.59	0.291
Zinc (T)	1.1	0.418
Total phenols	0.642	0.224
Oil and grease	22.4	7.47
TSS	28.4	11.2
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Cooper (T)	0.29	0.16	0.0485
Lead (T)	0.79	0.39	0.164
Zinc (T)	1.47	0.56	0.299
Total phenols	0.86	0.3	0.149
Oil and grease	30	10	3.73
TSS	38	15	7.47
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of sand reclaimed.
[2] These concentrations must be multiplied by the ratio of (89.5/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of sand reclaimed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

§ 464.33 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable, except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/1,000 kkg or lb/million lb of sand reclaimed; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent limitations for copper, lead, zinc, and total phenols. For non-continuous dischargers, annual average mass limitations and maximum day and maximum for monthly average concentration (mg/l) limitations shall apply. Concentration limitations and annual average mass limitations shall only apply to non-continuous dischargers.

(a) *Casting Cleaning Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0129	0.0071
Lead (T)	0.0237	0.0116
Zinc (T)	0.0437	0.0165

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0029
Lead (T)	0.53	0.26	0.0067
Zinc (T)	0.98	0.37	0.0116

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.35/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(2) Applicable to plants that are casting primarily steel to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0129	0.0071
Lead (T)	0.0353	0.0174
Zinc (T)	0.0656	0.025

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0029
Lead (T)	0.79	0.39	0.0098
Zinc (T)	1.47	0.56	0.0179

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.35/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(b) *Casting Quench Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/100 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0138	0.0076
Lead (T)	0.0252	0.0124
Zinc (T)	0.0466	0.0176

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0031
Lead (T)	0.53	0.26	0.0071
Zinc (T)	0.98	0.37	0.0124

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.7/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0138	0.0076
Lead (T)	0.0376	0.0185
Zinc (T)	0.0699	0.0266

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0031
Lead (T)	0.79	0.39	0.0105
Zinc (T)	1.47	0.56	0.019

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.7/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(c) *Dust Collection Scrubber Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.218	0.12
Lead (T)	0.398	0.195
Zinc (T)	0.736	0.278
Total phenols	0.646	0.225

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0488
Lead (T)	0.53	0.26	0.113
Zinc (T)	0.98	0.37	0.195
Total phenols	0.86	0.3	0.15

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.09/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.218	0.12
Lead (T)	0.593	0.293
Zinc (T)	1.1	0.421
Total phenols	0.656	0.225

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0488
Lead (T)	0.79	0.39	0.165
Zinc (T)	1.47	0.56	0.3
Total phenols	0.86	0.3	0.15

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.09/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to navigable waters.

(e) *Investment Casting.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	3.19	1.76
Lead (T)	5.84	2.86
Zinc (T)	10.8	4.07

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.716
Lead (T)	0.53	0.26	1.65
Zinc (T)	0.98	0.37	2.86

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	3.19	1.76
Lead (T)	8.7	4.3
Zinc (T)	16.2	6.17

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.716
Lead (T)	0.79	0.39	2.42
Zinc (T)	1.47	0.56	4.41

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(f) *Melting Furnace Scrubber Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.02	0.561
Lead (T)	1.86	0.911
Zinc (T)	3.44	1.3
Total Phenols	3.01	1.05

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.228
Lead (T)	0.53	0.26	0.526
Zinc (T)	0.98	0.37	0.911
Total Phenols	0.86	0.3	0.701

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed
[2] These concentrations must be multiplied by the ratio of (0.42/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.02	0.561
Lead (T)	2.77	1.37
Zinc (T)	5.15	1.96
Total Phenols	3.01	1.05

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.228
Lead (T)	0.79	0.39	0.771
Zinc (T)	1.47	0.56	1.4
Total Phenols	0.86	0.3	0.701

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.42/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(g) *Mold Cooling Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0428	0.0236
Lead (T)	0.0783	0.0384
Zinc (T)	0.145	0.0546

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0096
Lead (T)	0.53	0.26	0.0222
Zinc (T)	0.98	0.37	0.0384

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (17.7/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0428	0.0236
Lead (T)	0.117	0.0576
Zinc (T)	0.217	0.0827

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0096
Lead (T)	0.79	0.39	0.0325
Zinc (T)	1.47	0.56	0.0591

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (17.7/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(h) *Slag Quench Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0527	0.0291
Lead (T)	0.0964	0.0473
Zinc (T)	0.178	0.0673

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0118
Lead (T)	0.53	0.26	0.0273
Zinc (T)	0.98	0.37	0.0473

[1] Kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (21.8/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0527	0.0291
Lead (T)	0.144	0.0709

BAT Effluent Limitations—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Zinc (T)	0.267	0.102

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0118
Lead (T)	0.79	0.39	0.04
Zinc (T)	1.47	0.56	0.0728

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (21.8/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(i) *Wet Sand Reclamation Operations.*

(1) Applicable to plants that are casting primarily ductible or gray iron and to plants that are casting malleable iron where greater than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of sand reclaimed	
Copper (T)	0.217	0.12
Lead (T)	0.396	0.194
Zinc (T)	0.732	0.276
Total Phenols	0.642	0.224

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.85
Lead (T)	0.53	0.26	0.112
Zinc (T)	0.98	0.37	0.194
Total Phenols	0.86	0.3	0.149

[1] kg/1000 kkg (pounds per million pounds) of sand reclaimed.
[2] These concentrations must be multiplied by the ratio of (89.5/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of sand reclaimed) for a specific plant.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of sand reclaimed	
Copper (T)	0.217	0.12
Lead (T)	0.59	0.291
Zinc (T)	1.1	0.418
Total Phenols	0.642	0.224

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0485
Lead (T)	0.79	0.39	0.164
Zinc (T)	1.47	0.56	0.299
Total Phenols	0.86	0.3	0.149

[1] kg/1000 kkg (pounds per million pounds) of sand reclaimed.
[2] These concentrations must be multiplied by the ratio of (89.5/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of sand reclaimed) for a specific plant.

§ 464.34 New source performance standards.

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/1,000 kkg or lb/million lb of sand reclaimed; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent standards for copper, lead, zinc, total phenols, oil and grease, and TSS. For non-continuous dischargers, annual average mass standards and maximum day and maximum for monthly average concentration (mg/l) standards shall apply. Concentration standards and annual average mass standards shall only apply to non-continuous dischargers.

(a) *Casting Cleaning Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0129	0.0071
Lead (T)	0.0237	0.0116
Zinc (T)	0.0437	0.0165
Oil and grease	1.34	0.446
TSS	0.67	0.536
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0029
Lead (T)	0.53	0.26	0.0067
Zinc (T)	0.98	0.37	0.0116
Oil and grease	30	10	0.223
TTS	15	12	0.116
pH	(3)	(3)	(3)

[1] kg/1000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.35/x) where x is the actual normalized process

wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0129	0.0071
Lead (T)	0.0353	0.0174
Zinc (T)	0.0656	0.0025
Oil and grease	1.34	0.446
TSS	1.7	0.67
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0029
Lead (T)	0.79	0.39	0.0098
Zinc (T)	1.47	0.56	0.0179
Oil and grease	30	10	0.223
TTS	38	15	0.446
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.35/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(b) *Casting Quench Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0138	0.0076
Lead (T)	0.0252	0.0124
Zinc (T)	0.0466	0.0176
Oil and grease	1.43	0.476
TSS	0.713	0.571
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0031
Lead (T)	0.53	0.26	0.0071
Zinc (T)	0.98	0.37	0.0124
Oil and grease	30	10	0.238
TSS	15	12	0.124
pH	[1]	[1]	[1]

[1] Kg/1000 kkg (pounds per million pounds) of metal poured.
[2] Within the range of 7.0 to 10.0 at all times.
[3] These concentrations must be multiplied by the ratio of (5.7/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0138	0.0076
Lead (T)	0.0376	0.0185
Zinc (T)	0.0699	0.0266
Oil and grease	1.43	0.476
TSS	1.81	0.713
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0031
Lead (T)	0.79	0.39	0.0105
Zinc (T)	1.47	0.56	0.019
Oil and grease	30	10	0.238
TSS	38	15	0.476
pH	[1]	[1]	[1]

[1] Kg/1000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.7/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(c) *Dust Collection Scrubber Operations.*

(1) Applicable to plants that are casting primarily ductible or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.218	0.12
Lead (T)	0.398	0.195
Zinc (T)	0.736	0.278
Total Phenols	0.648	0.225
Oil and grease	22.5	7.51
TSS	11.3	9.01
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0488
Lead (T)	0.53	0.26	0.113
Zinc (T)	0.98	0.37	0.195
Total phenols	0.86	0.3	0.15
Oil and grease	30	10	3.76
TSS	15	12	1.95

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
pH	[3]	[3]	[3]

[1] kg/62.3 millions Sm^3 (pound per billion SCF) of air scrubbed.
[2] Within the range of 7.0 to 10.0 at all times.
[3] These concentrations must be multiplied by the ratio of (0.09/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.218	0.12
Lead (T)	0.593	0.293
Zinc (T)	1.1	0.421
Total phenols	0.656	0.225
Oil and grease	22.5	7.51
TSS	28.5	11.3
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0488
Lead (T)	0.79	0.39	0.165
Zinc (T)	1.47	0.56	0.3
Total phenols	0.86	0.3	0.15
Oil and grease	30	10	3.76
TSS	38	15	7.51
pH	[3]	[3]	[3]

[1] kg/62.3 millions Sm^3 (pound per billion SCF) of air scrubbed.
[2] Within the range of 7.0 to 10.0 at all times.
[3] These concentrations must be multiplied by the ratio of (0.09/) where is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to navigable waters.

(3) *Investment Casting.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	3.19	1.76
Lead (T)	5.84	2.86
Zinc (T)	10.8	4.07
Oil and grease	330	110

NSPS—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
TSS	165	132
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [2]
	(mg/l) [3]	(mg/l) [3]	
Copper (T)	0.29	0.16	0.716
Lead (T)	0.53	0.26	1.65
Zinc (T)	0.98	0.37	2.86
Oil and grease	30	10	55.1
TSS	15	12	28.6
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	3.19	1.76
Lead (T)	8.7	4.3
Zinc (T)	16.2	6.17
Oil and grease	330	110
TSS	419	165
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.716
Lead (T)	0.79	0.39	2.42
Zinc (T)	1.47	0.56	4.41
Oil and grease	30	10	55.1
TSS	38	15	110
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(f) *Melting Furnace Scrubber Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm [3] (pounds per billion SCF) of air scrubbed	
Copper (T)	1.02	0.561
Lead (T)	1.86	0.911
Zinc (T)	3.44	1.30
Total phenols	3.01	1.05
Oil and grease	105	35
TSS	52.6	42.1
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [2]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.228
Lead (T)	0.53	0.26	0.526
Zinc (T)	0.98	0.37	0.911
Total phenols	0.86	0.3	0.701
Oil and grease	30	10	17.5
TSS	15	12	9.11
pH	(3)	(3)	(3)

[1] kg/62.3 million Sm [3] (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.42/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air-scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm [3] (pounds per billion SCF) of air scrubbed	
Copper (T)	1.02	0.561
Lead (T)	2.77	1.37
Zinc (T)	5.15	1.96
Total phenols	3.01	1.05
Oil and grease	105	35
TSS	133	52.6
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.228
Lead (T)	0.79	0.39	0.771
Zinc (T)	1.47	0.56	1.4
Total phenols	0.38	0.3	0.701
Oil and grease	30	10	17.5
TSS	38	15	35
pH	(3)	(3)	(3)

[1] kg/62.3 million Sm [3] (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.42/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(g) *Mold Cooling Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater that 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg pounds per million pounds of metal poured	
Copper (T)	0.0428	0.0236
Lead (T)	0.0783	0.0384
Zinc (T)	0.0145	0.0546
Oil and grease	4.43	1.48
TSS	2.22	1.77
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [1]	
Copper (T)	0.29	0.16	0.0096
Lead (T)	0.53	0.26	0.0222
Zinc (T)	0.98	0.37	0.0384
Oil and grease	30	10	0.738
TSS	15	12	0.384
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to less that 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg pounds per million pounds of metal poured	
Copper (T)	0.0428	0.0236
Lead (T)	0.117	0.0576
Zinc (T)	0.217	0.0827
Oil and grease	4.43	1.48
TSS	5.61	2.22
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maxium for monthly average	Annual average [1]
	(mg/1) [2]	(mg/l) [2]	
Copper (T)	0.29	0.16	0.0096
Lead (T)	0.79	0.39	0.0325
Zinc (T)	1.47	0.56	0.0591
Oil and grease	30	10	0.738
TSS	38	15	1.48
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1,320/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(h) *Slag Quench Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily

malleable iron where greater than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0527	0.0291
Lead (T)	0.0964	0.0473
Zinc (T)	0.178	0.0673
Oil and grease	5.46	1.82
TSS	2.73	2.18
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[2]	
Copper (T)	0.29	0.16	0.0118
Lead (T)	0.53	0.26	0.0273
Zinc (T)	0.98	0.37	0.0473
Oil and grease	30	10	0.909
TSS	15	12	0.473
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (21.8/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0527	0.0291
Lead (T)	0.144	0.0709
Zinc (T)	0.267	0.102
Oil and grease	5.46	1.82
TSS	6.91	2.73
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average
	(mg/l)[2]	(mg/1)[2]	
Copper (T)	0.29	0.16	0.0118
Lead (T)	0.79	0.39	0.04
Zinc (T)	1.47	0.56	0.0728
Oil and grease	30	10	0.909
TSS	38	15	1.82
pH	(3)	(3)	(3)

[1] kg/1000 kkg pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (21.8/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(i) *Wet Sand Reclamation Operations.*

(1) Applicable to plants that are casting primarily ductile or gray iron and to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of sand reclaimed	
Copper (T)	0.217	0.12
Lead (T)	0.396	0.194
Zinc (T)	0.732	0.276
Total phenols	0.642	0.224
Oil and grease	22.4	7.47
TSS	11.2	8.96
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[3]	
Copper (T)	0.29	0.16	0.0485
Lead (T)	0.53	0.26	0.112
Zinc (T)	0.98	0.37	0.194
Total phenols	0.86	0.3	0.149
Oil and grease	30	10	3.71
TSS	15	12	1.94
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of sand reclaimed.
[2] These concentrations must be multiplied by the ratio of (89.5/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of sand reclaimed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(2) Applicable to plants that are casting primarily steel and to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year.

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of sand reclaimed	
Copper (T)	0.217	0.12
Lead (T)	0.59	0.291
Zinc (T)	1.1	0.418
Total phenols	0.642	0.224
Oil and grease	22.4	7.47
TSS	28.4	11.2
pH	(1)	(1)

[1] Within the range of 7.0 to at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average[1]
	(mg/l)[2]	(mg/l)[3]	
Copper (T)	0.29	0.16	0.0485
Lead (T)	0.79	0.39	0.164
Zinc (T)	1.47	0.56	0.299
Total phenols	0.86	0.3	0.149
Oil and grease	30	10	3.73
TSS	38	15	7.47
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of sand reclaimed.
[2] These concentrations must be multiplied by the ratio of (89.5/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of sand reclaimed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

§ 464.35 Pretreatment standards for existing sources.

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources.

(a) *Casting Cleaning Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0129	0.0071
Lead (T)	0.0237	0.0116
Zinc (T)	0.0437	0.0165

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0129	0.0071
Lead (T)	0.0353	0.0174
Zinc (T)	0.0656	0.025

(b) *Casting Quench Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured.	
Copper (T)	0.0138	0.0076
Lead (T)	0.0252	0.0124
Zinc (T)	0.0466	0.0176
TTO	0.0257	0.00838
Oil and grease (for alternate monitoring)	1.43	0.476

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0138	0.0076
Lead (T)	0.0376	0.0185
Zinc (T)	0.0699	0.0266
TTO	0.0257	0.00838
Oil and grease (for alternate monitoring)	1.43	0.476

(c) *Dust Collection Scrubber Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.218	0.12
Lead (T)	0.398	0.195
Zinc (T)	0.736	0.278
Total Phenols	0.646	0.225
TTO	2.04	0.664
Oil and Grease (for alternate monitoring)	22.5	7.51

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.218	0.12
Lead (T)	0.593	0.293
Zinc (T)	1.1	0.421
Total Phenols	0.656	0.225
TTO	2.04	0.664
Oil and Grease (for alternate monitoring)	22.5	7.51

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to a POTW.

(e) *Investment Casting.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	3.19	1.76
Lead (T)	5.84	2.86
Zinc (T)	10.8	4.07
TTO	13.2	4.3
Oil and Grease (for alternate monitoring)	330	110

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	3.19	1.76
Lead (T)	8.7	4.3
Zinc (T)	16.2	6.17
TTO	13.2	4.3
Oil and Grease (for alternate monitoring)	330	110

(f) *Melting Furnace Scrubber Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.02	0.561
Lead (T)	1.86	0.911
Zinc (T)	3.44	1.30
Total phenols	3.01	1.05
TTO	8.34	2.73
Oil and grease (for alternate monitoring)	105	35

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.02	0.561
Lead (T)	2.77	1.37
Zinc (T)	5.15	1.96
Total phenols	3.01	1.05
TTO	8.34	2.73
Oil and grease (for alternate monitoring)	105	35

(g) *Mold Cooling Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per billion pounds) of metal poured	
Copper (T)	0.0428	0.0236
Lead (T)	0.0783	0.0384
Zinc (T)	0.145	0.0546
TTO	0.0797	0.026
Oil and grease (for alternate monitoring)	4.43	1.48

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where

greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per billion pounds) of metal poured	
Copper (T)	0.0428	0.0236
Lead (T)	0.117	0.0576
Zinc (T)	0.217	0.0827
TTO	0.0797	0.026
Oil and grease (for alternate monitoring)	4.43	1.48

(h) *Slag Quench Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0527	0.0291
Lead (T)	0.0964	0.0473
Zinc (T)	0.178	0.0673
TTO	0.0257	0.00838
Oil and grease (for alternate monitoring)	5.46	1.82

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0527	0.0291
Lead (T)	0.144	0.0709
Zinc (T)	0.267	0.102
TTO	0.0257	0.00838
Oil and grease (for alternate monitoring)	5.46	1.82

(i) *West Sand Reclamation Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting gray iron where greater than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of sand reclaimed	
Copper (T)	0.217	0.12
Lead (T)	0.396	0.194
Zinc (T)	0.732	0.276
Total Phenols	0.642	0.224
TTO	1.18	0.386
Oil and grease (for alternate monitoring)	22.4	7.47

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of sand reclaimed	
Copper (T)	0.217	0.12
Lead (T)	0.59	0.291
Zinc (T)	1.1	0.418
Total Phenols	0.642	0.224
TTO	1.18	0.386
Oil and grease (for alternate monitoring)	22.4	7.47

§ 464.36 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources.

(a) *Casting Cleaning Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0129	0.0071
Lead (T)	0.0237	0.0116
Zinc (T)	0.0437	0.0165

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0129	0.0071
Lead (T)	0.0353	0.0174
Zinc (T)	0.0656	0.025

(b) *Casting Quench Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0138	0.0076
Lead (T)	0.0252	0.0124
Zinc (T)	0.0466	0.0176
TTO	0.0257	0.00838
Oil and Grease (for alternate monitoring)	1.43	0.476

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0138	0.0076
Lead (T)	0.0376	0.0185
Zinc (T)	0.0699	0.0266
TTO	0.0257	0.00838
Oil and Grease (for alternate monitoring)	1.43	0.476

(c) *Dust Collection Scrubber Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.218	0.12
Lead (T)	0.398	0.195
Zinc (T)	0.736	0.278
Total Phenols	0.646	0.225
TTO	2.04	0.664
Oil and Grease (for alternate monitoring)	22.5	7.51

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	0.218	0.12
Lead (T)	0.593	0.293
Zinc (T)	1.1	0.421
Total Phenols	0.656	0.225
TTO	2.04	0.664
Oil and Grease (for alternate monitoring)	22.5	7.51

(d) *Grinding Scrubber Operations.* No discharge of process wastewater pollutants to a POTW.

(e) *Investment Casting.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	3.19	1.76
Lead (T)	5.84	2.86
Zinc (T)	10.8	4.07
TTO	13.2	4.3
Oil and Grease (for alternate monitoring)	330	110

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	3.19	1.76
Lead (T)	8.7	4.3
Zinc (T)	16.2	6.17
TTO	13.2	4.3
Oil and Grease (for alternate monitoring)	330	110

(f) *Melting Furnace Scrubber Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.02	0.561
Lead (T)	1.86	0.911
Zinc (T)	3.44	1.3
Total Phenols	3.01	1.05
TTO	8.34	2.73
Oil and Grease (for alternate monitoring)	105	35

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.02	0.561
Lead (T)	2.77	1.37
Zinc (T)	5.15	1.96
Total Phenols	3.01	1.05
TTO	8.34	2.73
Oil and Grease (for alternate monitoring)	105	35

(g) *Mold Cooling Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0428	0.0236
Lead (T)	0.0783	0.0384
Zinc (T)	0.145	0.0546
TTO	0.0797	0.026
Oil and Grease (for alternate monitoring)	4.43	1.48

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0428	0.0236
Lead (T)	0.117	0.0576
Zinc (T)	0.217	0.0827
TTO	0.0797	0.026
Oil and Grease (for alternate monitoring)	4.43	1.48

(h) *Slag Quench Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron

where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0527	0.0291
Lead (T)	0.0964	0.0473
Zinc (T)	0.178	0.0673
TTO	0.0257	0.00838
Oil and grease (for alternate monitoring)	5.46	1.82

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0527	0.0291
Lead (T)	0.144	0.0709
Zinc (T)	0.267	0.102
TTO	0.0257	0.00838
Oil and grease (for alternate monitoring)	5.46	1.82

(i) *Wet Sand Reclamation Operations.*

(1) Applicable to plants that are casting primarily ductile iron, to plants that are casting primarily malleable iron where greater than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where greater than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of sand reclaimed	
Copper (T)	0.217	0.12
Lead (T)	0.396	0.194
Zinc (T)	0.732	0.276
Total phenols	0.642	0.224
TTO	1.18	0.386
Oil and grease (for alternate monitoring)	22.4	7.47

(2) Applicable to plants that are casting primarily steel, to plants that are casting primarily malleable iron where equal to or less than 3,557 tons of metal are poured per year, and to plants that are casting primarily gray iron where equal to or less than 1,784 tons of metal are poured per year.

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of sand reclaimed	
Copper (T)	0.217	0.12
Lead (T)	0.59	0.291
Zinc (T)	1.10	0.418
Total phenols	0.642	0.224
TTO	1.18	0.386
Oil and grease (for alternate monitoring)	22.4	7.47

§ 464.37 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology. [Reserved].

Subpart D—Zinc Casting Subcategory

§ 464.40 Applicability; description of the zinc casting subcategory.

The provisions of this subpart are applicable to discharges to waters of the United States and to the introduction of pollutants into publicly owned treatment works resulting from zinc casting operations as defined in § 464.02(d).

§ 464.41 Specialized definitions.

For the purpose of this subpart:

(a) *Total Toxic Organics* (TTO). TTO is a regulated parameter under PSES (§ 464.45) and PSNS (§ 464.46) for the zinc subcategory and is comprised of a discrete list of toxic organic pollutants for each process segment where it is regulated, as follows:

(1) Casting Quench (§ 464.45(a) and § 464.46(b)):

21. 2,4,6-trichlorophenol
22. para-chloro meta-cresol
31. 2,4-dichlorophenol
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride (dichloromethane)
65. phenol
66. bis(2-ethylhexyl) phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
85. tetrachloroethylene

(2) Die Casting (§ 465.45(b) and § 464.46(b)):

1. acenaphthene
21. 2,4,6-trichlorophenol
22. para-chloro meta-cresol
24. 2-chlorophenol
34. 2,4-dimethylphenol
44. methylene chloride (dichloromethane)
55. naphthalene
65. phenol
66. bis (2-ethylhexyl) phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
85. tetrachloroethylene
86. toluene
87. trichloroethylene

(3) Melting Furnace Scrubber (§ 464.45(c) and § 464.46(c)):

31. 2,4-dichlorophenol
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride (dichloromethane)
55. naphthalene
65. phenol
66. bis(2-ethylhexyl) phthalate
68. di-n-butyl phthalate
85. tetrachloroethylene
86. toluene
87. trichloroethylene

(4) Mold Cooling (§ 464.45(d) and § 464.46(d)):

21. 2,4,6-trichlorophenol
22. para-chloro meta-cresol
31. 2,4-dichlorophenol
34. 2,4-dimethylphenol
39. fluoranthene
44. methylene chloride (dichloromethane)
65. phenol
66. bis(2-ethylhexyl) phthalate
68. di-n-butyl phthalate
70. diethyl phthalate
85. tetrachloroethylene

§ 464.42 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available, except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent limitations for copper, lead, zinc, total phenols, oil and grease, and TSS. For non-continuous dischargers, annual average mass limitations and maximum day and maximum for monthly average concentration (mg/1) limitations shall apply. Concentration limitations and annual average mass limitations shall only apply to noncontinuous dischargers.

(a) *Casting Quench Operations.*

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0344	0.0187
Lead (T)	0.0353	0.0174
Zinc (T)	0.0509	0.0192
Oil and grease	1.34	0.446
TSS	1.7	0.67
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/1) [2]	(mg/1) [2]	
Copper (T)	0.77	0.42	0.0076
Lead (T)	0.79	0.39	0.0098
Zinc (T)	1.14	0.43	0.0121
Oil and grease	30	10	0.223
TSS	38	15	0.446
pH	(3)	(3)	(3)

[1] kg/1000 kkg (pound per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.35/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(b) *Die Casting Operations.*

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0066	0.0036
Lead (T)	0.0068	0.0034
Zinc (T)	0.0098	0.0037
Total phenols	0.0074	0.0026
Oil and grease	0.259	0.0864
TTS	0.328	0.13
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0015
Lead (T)	0.79	0.39	0.0019
Zinc (T)	1.14	0.43	0.0023
Total phenols	0.86	0.3	0.0017
Oil and grease	30	10	0.0432
TSS	38	15	0.0864
pH	(3)	(3)	(3)

[1] kg/1000 kkg (pound per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.04/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(c) *Melting Furnace Scrubber Operations.*

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 millions Sm [3] (pounds per billion SCF) of air scrubbed	
Copper (T)	1.56	0.852
Lead (T)	1.6	0.791
Zinc (T)	2.31	0.872
Total Phenols	1.74	0.608
Oil and grease	60.8	20.3
TSS	77.1	30.4
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.345
Lead (T)	0.79	0.39	0.446
Zinc (T)	1.44	0.43	0.548
Total Phenols	0.86	0.3	0.406
Oil and grease	30	10	10.1
TSS	38	15	20.3
pH	(3)	(3)	(3)

[1] kg/62.3 million Sm [3] (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.243/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(d) *Mold Cooling Operations.*

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million SCF) of metal poured	
Copper (T)	0.304	0.166
Lead (T)	0.311	0.154
Zinc (T)	0.449	0.17
Oil and grease	11.8	3.94
TSS	15	5.91
pH	(1)	(1)

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.067
Lead (T)	0.79	0.39	0.0867
Zinc (T)	1.44	0.43	0.106
Oil and grease	30	10	1.97
TSS	38	15	3.94
pH	(3)	(3)	(3)

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (47.3/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

§ 464.43 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable, except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/62.3 million Sm [3] or lb/billion SCF of air scrubbed) effluent limitations for copper, lead, zinc, and total phenols. For non-continuous dischargers, annual average mass limitations and maximum day and maximum for monthly average concentration (mg/1) limitations shall apply. Concentration limitations and annual average mass limitations shall only apply to non-continuous dischargers.

(a) *Casting Quench Operations.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0344	0.0187
Lead (T)	0.0237	0.0116
Zinc (T)	0.0339	0.0129

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Cooper (T)	0.77	0.42	0.0076
Lead (T)	0.53	0.26	0.0067
Zinc (T)	0.76	0.29	0.008

[1] kg/1,000 kkg (pounds per million pounds) of metal poured
[2] These concentrations must be multiplied by the ratio of (5.35/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(b) *Die Casting Operations.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0066	0.0036
Lead (T)	0.0046	0.0022
Zinc (T)	0.0066	0.0025
Total phenols	0.0074	0.0026

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0015
Lead (T)	0.53	0.26	0.0013
Zinc (T)	0.76	0.29	0.0016
Total phenols	0.86	0.3	0.0017

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.04/x) where x is the actual normalized process

wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(c) *Melting Furnace Scrubber Operations.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.56	0.852
Lead (T)	1.07	0.527
Zinc (T)	1.54	0.588
Total phenolse	1.74	0.608

	Maximum for any 1 day	Maximum for monthly. average	Annual aver-age [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.345
Lead (T)	0.53	0.26	0.304
Zinc (T)	0.76	0.29	0.365
Total phenols	0.86	0.3	0.406

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.243/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

(d) *Mold Cooling Operations.*

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.304	0.166
Lead (T)	0.209	0.103
Zinc (T)	0.3	0.114

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.042	0.067
Lead (T)	0.53	0.26	0.0591
Zinc (T)	0.76	0.29	0.071

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (47.3/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.

§ 464.44 New source performance standards.

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and maximum for monthly average mass (kg/1,000 kkg or lb/million lb of metal poured; kg/62.3 million Sm^3 or lb/billion SCF of air scrubbed) effluent standards for copper, lead, zinc, total phenols, oil and grease, and TSS. For non-continuous dischargers, annual average mass standards and maximum day and maximum for monthly average concentration (mg/l) standards shall apply. Concentration standards and annual average mass standards shall only apply to non-continuous dischargers.

(a) *Casting Quench Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0344	0.0187
Lead (T)	0.0237	0.0166
Zinc (T)	0.0339	0.0129
Oil and grease	1.34	0.446
TSS	0.67	0.536
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0076
Lead (T)	0.53	0.26	0.0067
Zinc (T)	0.76	0.29	0.008
Oil and grease	30	10	0.223
TSS	15	12	0.116
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (5.35/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(b) *Die Casting Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0066	0.0036
Lead (T)	0.0046	0.0022
Zinc (T)	0.0066	0.0025
Total phenols	0.0074	0.0026
Oil and grease	0.259	0.0864
TSS	0.13	0.104
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.0015
Lead (T)	0.53	0.26	0.0013
Zinc (T)	0.76	0.29	0.0016
Total phenols	0.86	0.3	0.0017
Oil and grease	30	10	0.0432
TSS	15	12	0.0225
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (1.04/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(c) *Melting Furnace Scrubber Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.56	0.852
Lead (T)	1.07	0.527
Zinc (T)	1.54	0.588
Total phenols	1.74	0.608
Oil and grease	60.8	20.3
TSS	30.4	24.3
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.345
Lead (T)	0.53	0.26	0.304
Zinc (T)	0.76	0.29	0.365
Total phenols	0.86	0.3	0.406
Oil and grease	30	10	10.1
TSS	15	12	5.27
pH	[3]	[3]	[3]

[1] kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed.
[2] These concentrations must be multiplied by the ratio of (0.243/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 SCF of air scrubbed) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

(d) *Mold Cooling Operations.*

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.304	0.166
Lead (T)	0.209	0.103
Zinc (T)	0.3	0.114
Oil and grease	11.8	3.94
TSS	5.91	4.73
pH	[1]	[1]

[1] Within the range of 7.0 to 10.0 at all times.

	Maximum for any 1 day	Maximum for monthly average	Annual average [1]
	(mg/l) [2]	(mg/l) [2]	
Copper (T)	0.77	0.42	0.067
Lead (T)	0.53	0.26	0.0591
Zinc (T)	0.76	0.29	0.71
Oil and grease	30	10	1.97
TSS	15	12	1.03
pH	[3]	[3]	[3]

[1] kg/1,000 kkg (pounds per million pounds) of metal poured.
[2] These concentrations must be multiplied by the ratio of (47.3/x) where x is the actual normalized process wastewater flow (in gallons per 1,000 pounds of metal poured) for a specific plant.
[3] Within the range of 7.0 to 10.0 at all times.

§ 464.45 Pretreatment standards for existing sources.

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces

pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources.

(a) *Casting Quench Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0344	0.0187
Lead (T)	0.0237	0.0116
Zinc (T)	0.0339	0.0129
TTO	0.093	0.0304
Oil and grease (for alternate monitoring)	1.34	0.446

(b) *Die Casting Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds of metal poured)	
Copper (T)	0.0066	0.0036
Lead (T)	0.0046	0.0022
Zinc (T)	0.0066	0.0025
Total phenols	0.0074	0.0026
TTO	0.0196	0.0064
Oil and grease for alternate monitoring)	0.259	0.0864

(c) *Melting Furnace Scrubber Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.56	0.852
Lead (T)	1.07	0.527
Zinc (T)	1.54	0.588
Total phenols	1.74	0.608
TTO	3.95	1.29
Oil and grease for alternate monitoring)	60.8	20.3

(d) *Mold Cooling Operations.*

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.304	0.166
Lead (T)	0.209	0.103
Zinc (T)	0.3	0.114
TTO	0.821	0.268
Oil and grease for alternate monitoring)	11.8	3.94

§ 464.46 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources.

(a) *Casting Quench Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0344	0.0187
Lead (T)	0.0237	.0116
Zinc (T)	0.0339	0.0129
TTO	0.093	0.0304
Oil and grease (for alternate monitoring)	1.34	0.446

(b) *Die Casting Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.0066	0.0036
Lead (T)	0.0046	0.0022
Zinc (T)	0.0066	0.0025

PSNS—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Total phenols	0.0074	0.0026
TTO	0.0196	0.0064
Oil and grease (for alternate monitoring)	0.259	0.0864

(c) *Melting Furnace Scrubber Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/62.3 million Sm^3 (pounds per billion SCF) of air scrubbed	
Copper (T)	1.56	0.852
Lead (T)	1.07	0.527
Zinc (T)	1.54	0.588
Total phenols	1.74	0.608
TTO	3.95	1.29
Oil and grease (for alternate monitoring)	60.8	20.3

(d) *Mold Cooling Operations.*

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	kg/1,000 kkg (pounds per million pounds) of metal poured	
Copper (T)	0.304	0.166
Lead (T)	0.209	0.103
Zinc (T)	0.3	0.114
TTO	0.821	0.268
Oil and grease (for alternate monitoring)	11.8	3.94

§ 464.47 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology [Reserved].

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