ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 466

[WH-FRL 2229-1]

Porcelain Enameling Point Source Category; Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: This regulation establishes effluent limitations and standards limiting the discharge of pollutants into navigable waters and into publicly owned treatment works by existing and new sources that conduct porcelain enameling operations. The Clean Water Act and a consent decree require EPA to issue this regulation.

The purpose of this regulation is to specify effluent limitations for "best practicable technology," "best available technology," and "new source performance standards" for direct dischargers and to establish pretreatment standards for indirect dischargers.

DATES: In accordance with 40 CFR 100.01 (45 FR 26048), this regulation shall be considered issued for purposes of judicial review at 1:00 p.m. Eastern time on December 8, 1982. These regulations shall become effective January 7, 1983, except Section 466.03 which contains information collection requirements which are under review at OMB. The compliance date for the BAT regulations is as soon as possible, but in any event no later that July 1, 1984. The compliance date for new source performance standards and new source pretreatment standards is the date the new source begins operation. The compliance date for Pretreatment Standards for Existing Sources is November 25, 1985.

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 requirement 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 Supplementary Information under "XIV Availability of Technical Information" for a description of each document.

Technical information may be obtained by writing to Ernst P. Hall, Effluent Guidelines Division (WH-552), EPA, 401 M Street, SW., Washington, D.C. 20460, or through calling (202) 382-7126. Copies of the technical and economic documents may be obtained from the National Technical Information Service, Springfield, Virginia 22161 (703/487-4600).

The Record will be available for public review not later than January 28, 1983, in EPA's Public Information Reference Unit, Room 2404 (Rear) (EPA Library), 401 M Street, SW., Washington, D.C. The EPA information regulation (40 CFR Part 2) provides that a reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Mr. Ernst P. Hall, (202) 382-7126.

SUPPLEMENTARY INFORMATION:

Organization of This Notice

I. Legal Authority

This regulation is being promulgated under the authority of Sections 301, 304, 306, 307, 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 called the "Act." It is also being 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).

II. Scope of This Rulemaking

This regulation establishes effluent limitations and standards for existing and new porcelain enameling operations. Porcelain enameling consists of that sequence or combination of steps or operations which prepare the metal surface and apply a porcelain or fused silicate coating to the metal basis material.

EPA's 1973 to 1976 round of rulemaking emphasized the achievement of best practicable technology currently available (BPT) by July 1, 1977. In general, BPT represents the average of the best existing performances of well-known technologies for control of familiar (i.e., "classical") pollutants. This effort did not include rulemaking specific to porcelain enameling.

The current round of rulemaking aims for the achievement by July 1, 1984, of the best available technology economically achievable (BAT) that will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants. At a minimum, BAT represents the performance of the best available technology economically achievable in any industrial category or subcategory. Moreover, as a result of the Clean Water Act of 1977, the emphasis of EPA's program has shifted from "classical" pollutants to the control of toxic pollutants.

EPA is promulgating limitations based on BPT and BAT, new source performance standards (NSPS), pretreatment standards for existing sources (PSES), and pretreatment standards for new sources (PSNS) for Subpart A—Steel Basis Material, Subpart B—Cast Iron Basis Material, and Subpart C—Aluminum Basis Material. EPA is promulgating NSPS and PSNS for Subpart D—Copper Basis Material.

III. Summary of Legal Background

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 to issue effluent limitations guidelines, pretreatment standards, and new source performance standards for industry dischargers.

The Act included a timetable for issuing these guidelines. However, EPA was unable to meet many of the deadlines and, as a result, in 1976, the Agency was sued by several environmental groups. In settling this lawsuit, EPA and the plaintiffs executed a court-approved "Settlement Agreement." This Agreement required EPA to develop a program and adhere to a schedule in promulgating effluent limitations, new source performance standards and pretreatment standards for 65 "priority" pollutants and classes of pollutants in 21 major industries. See *Natural Resources Defense Council, Inc.* v. *Train*, 8 ERC 2120 (D.D.C. 1976), *modified*, 12 ERC 1833 (D.D. 1979).

Many of the basic elements of this Settlement Agreement program were incorporated into the Clean Water Act of 1977. Like the Agreement, the Act stressed control of toxic pollutants, including the 65 "priority" pollutants. In addition, to strengthen 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 program is to set a number of different kinds of effluent limitations. These are discussed in detail in the preamble to the proposed regulation for this category and in the development document supporting this final regulation. They are summarized briefly below:

1. *Best Practicable Control Technology (BPT).*

BPT limitations are generally based on the average of the best existing performance by plants of various sizes, ages, and unit processes within the industry or subcategory.

In establishing BPT limitations, we balance the total cost of applying the technology against the effluent reduction benefits achievable. This is a limited balancing, in that we are not required to quantify benefits in monetary terms.

2. *Best Available Technology (BAT).*

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

In arriving at BAT, the Agency retains considerable discretion in assigning the weight to be accorded costs. We need only consider the cost of applying the technology; no cost-benefit analysis is required.

3. *Best Conventional Pollutant Control Technology (BCT).*

The 1977 Amendments added Section 301 (b)(2)(E) to the Act establishig "best conventional pollutant control technology" (BCT) for discharges of conventional pollutants, from existing industrial point sources.

BCT is not an an additional limitation but replaces BAT for the control of conventional pollutants, TSS, BOD, oil and grease, pH and fecal coliforms. In addition to other factors specified in section 304 (b)(4)(B), the Act requires that BCT limitations be assessed in light of a two part "cost-reasoableness" 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 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 published its methodology for analyzing BCT costs on August 29, 1979 (44 FR 50732). In the case noted above, the Court of Appeals ordered EPA to correct data errors underlying EPA's calculation of the first test, and to apply the second cost test. (EPA had argued that a second cost test was not required.)

EPA has determined that the technology which is the basis for porcelain enameling BAT can remove significant amounts of conventional pollutants. However, EPA has not yet promulgated a revised BCT methodology in response to the *American Paper Institute* v. *EPA* decision mentioned earlier. Accordingly, EPA is deferring a decision on the appropriate final BCT limitations.

4. *New Source Performance Standards (NSPS).*

NSPS are based on 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 (POTW). They must be achieved within three years of promulgation. The Clean Water Act of 1977 requires pretreatment for toxic pollutants that pass through the POTW in amounts that would violate direct discharger effluent limitations or limit POTW sludge management alternatives, including the beneficial use of sludges on agricultural lands. The legislative history of the 1977 Act indicates that pretreatment standards are to be technology-based, analogous to the best available technology for removal of toxic pollutants. The general pretreatment regulations (40 CFR Part 403), which serve as the framework for pretreatment regulations were published in 46 FR 9104 (January 28, 1981).

6. *Pretreatment Standards for New Sources (PSNS).*

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

IV. Methodology and Data Gathering Efforts

The data gathering efforts and methodology used in developing the proposed regulations are summarized in the Preamble to the Proposed Porcelain Enameling Industrial Point Source Category Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards (46 FR 8860, January 27, 1981). The *Development Document for Effluent Limitations Guidelines and Standards for the Porcelain Enameling Industrial Point Source Category* describes the data gathering efforts and methodologies used in developing this final regulation.

Since proposal, the Agency has re-analyzed treatment effectiveness data and treatment costs. In the proposed porcelain enameling regulation, the Agency relied on the data we collected from sampling and analysis of raw and treated wastewaters from the aluminum forming, battery manufacturing, copper forming, coil coating, porcelain enameling and electroplating categories to determine the effectiveness of the

lime and settle, technologies upon which proposed limitations and standards were based. The preamble to the proposed regulation explains why pooled data were used to determine treatment effectiveness. Subsequent to proposal an analysis of variance of both raw and treated pollutant concentrations was made to determine the homogeneity of the data base. The electroplating data was found to substantially reduce the homogeneity of the pooled data while including or removing data from any other category did not meaningfully alter the homogeneity of the data pool. Therefore, the electroplating data was removed from the pooled data base and only data from the remaining five categories were used for determining the treatment effectiveness of the technologies. Section VII of the development document and other documents in the administrative record for this rulemaking explain how the Agency re-analyzed these data.

Subsequent to proposal, the Agency refined its analysis of the cost of model treatment systems used to calculate limitations and standards. As a consequence, estimated costs of compliance were increased. Section VIII of the technical development document and related documents in the record explain the basis for the revised costs estimates.

V. Control Treatment Options and Technology Basis for Final Regulations

A. Summary of Category

"Porcelain enameling" is a term used to describe the combination of processing steps involved in applying a thermally fused glass-like coating to a metal basis material. This glass-like procelain coating gives both decorative and engineering properties to the basis material making it useful in a wide range of products.

Four basis materials are most frequently used for porcelain enameling; steel (sometimes called enameling iron), cast iron, aluminum and copper. Gold is frequently procelain enameled for dental restorations and precious and semiprecious metals are porcelain enameled for jewelry and art objects. Generally, these small volume uses of porcelain enamel are not controlled by this regulation because precious metals are not included as a basis material.

The Agency considered regulating porcelain enameling on precious metals and decided against developing a national regulation because of the apparent nature of this aspect of porcelain enameling. Generally the pieces procelain enameled (and hence the total area processed) are quite small (for example, a dental crown might have a porcelain enameled area of 0.1 in^2 while a locket might be about 1.0 in^2). The locations at which such activities take place vary widely—e.g. dentists offices, dental laboratories, hobby shops, schools, etc. Most of these operations are believed to be small indirect dischargers which would not be covered by the categorical standards established in this regulation. For these reasons the Agency decided not to regulate porcelain enameling of precious metals.

Generally, there are two major groups of operations in porcelain enameling. The first group of operations is metal preparation in which oil and dirt are removed, the metal surface roughened by etching or sand blasting to assist adherence of the coating, and application of a bonding material such as nickel, cobalt, or chromium to promote chemical bonding of the enamel to the basis metal. The second group or coating operations includes ball milling, manufacturing the wet coating material or slip, slip application, and firing or fusing the porcelain enamel coating.

Water is used throughout most of the porcelain enameling process. Metal preparation of steel, aluminum and copper is usually a wet process involving alkaline cleaning to remove oil, and etching to roughen the metal surface and immersion plating or conversion coating to apply the bonding material. Rinsing to clean the workpiece after each metal preparation step generates substantial volumes of process wastewater. In the coatings operations, water is part of the coating material, is used to cool and clean the ball mill, and to clean unwanted slip from both the workpiece and the work area.

The most important resulting pollutants or pollutant properties are: (1) Toxic metals—antimony, arsenic, cadmium, chromium, copper, cyanide, lead, nickel, selenium and zinc; (2) conventional pollutants—TSS and pH; and (3) nonconventional pollutants—aluminum and iron. Toxic organic pollutants were not found in the samples analyzed.

Because of the large amounts of toxic metals present, the sludges generated by wastewater treatment generally contain substantial amounts of toxic metals.

Within the subcategories covered by this regulation, there are 28 direct dischargers and 88 indirect dischargers.

B. Control and Treatment Options

The control and treatment technologies considered by EPA in developing this regulation include both in-process and end-of-pipe treatments. A wide range of treatment options were considered before proposing the porcelain enameling regulation and are detailed in the preamble to the proposed regulation. Major technology options considered after proposal are discussed in this document while minor options which were considered in developing the proposed rule are not specifically discussed here but are discussed in the development document.

In-process treatment includes a variety of water flow reduction steps and major process changes such as treated wastewater reuse where product quality is not affected by the quality of the water used and countercurrent cascade rinsing to reduce the amount of wastewater treated and pollutants discharged.

End-of-pipe treatment includes: cyanide oxidation or precipitation; hexavalent chromium reduction; chemical precipitation of metals using hydroxides, carbonates, or sulfides; and removal of precipitated metals and other materials using settling, filtration, and combinations of these technologies. As a result of comments received on the proposal, EPA evaluated a sump settling technology as a possible basis for BPT limitations or PSES standards.

The effectiveness of these treatment technologies has been evaluated and established by examining the performance of these technologies on porcelain enameling and other similar wastewaters. The data base for the performance of hydroxide precipitation-sedimentation technology is a composite of data drawn from EPA sampling and analysis of copper and aluminum forming, battery manufacturing, porcelain enameling, and coil coating. This data, called the combined metal data base, reports influent and effluent concentrations for nine pollutants. These wastewaters are judged to be similar in all material respects for treatment because they contain a range of dissolved metals which can be removed by precipitation and solids removal.

In the proposed porcelain enameling regulation, the Agency relied on the data we collected from sampling and analyzing raw and treated wastewaters from the aluminum forming, battery manufacturing, copper forming, coil coating, porcelain enameling and electroplating categories to determine the effectiveness of the lime and settle, and lime, settle and filter technologies. Subsequent to proposal an analysis of variance of both raw and treated pollutant concentrations of the pooled data was made to determine its

homogeneity. The electroplating data was found to substantially reduce the homogeneity of the pooled data while the inclusion or removal of data from any other category did not meaningfully alter the homogeneity of the data pool. Therefore, the electroplating data were removed from the pooled data base and only data from the remaining five categories was used for determining treatment effectiveness of the technologies.

The effectiveness of lime and settle technology in removing other pollutant was calculated from data from other categories. See Section VII of the development document.

Twenty eight porcelain enameling plants have some form of lime and settle treatment; six of these have polishing filters; several apply the L&S to only part of their wastewater; some are poorly operated (based on plant supplied data) and many cannot be evaluated because they did not supply data. Only about four plants appear to be well designed and operated. Data solely from these plants are not used as the bases for limitations and standards since more data is needed for proper statistical analysis. These plants are included in the combined metals data base which is used as the basis for limitations and standards.

To establish the treatment effectiveness of lime, settle and filter, the technologies used as the basis for NSPS and PSNS, EPA used data from three plants that had the recommended technology in place: two porcelain enameling plants and one other plant whose wastewater was similar to the wastewater generated at porcelain enameling plants. In generating long-term average standards for NSPS and PSNS , EPA applied variability factors from the combined metals data base because the combined data base provided a better statistical basis for computing variability than the data from the three plants sampled. The combined data base is composed of data showing the treatment effectiveness of lime and settle without filtration. For pollutants for which there were no data from the L&S plants, long-term concentrations were developed assuming that filtration would remove 33 percent more pollutants than lime and settle. This assumption was based upon a comparison of removals of several pollutants by lime and settle and lime, settle, and filter technologies. The pooled data base which contained data from four porcelain enameling plants was used to provide treatment effectiveness values. The larger pooled data set allowed the Agency to calculate variability factors with greater confidence in the derived values than the small data set would provide.

The lime and settle treatment effectiveness values used in the proposed regulation were derived from the full pooled data set described above using statistical methodology which assumed the data set was normally distributed. Variability factors for estimating a one day and thirty day average value were transferred from electroplating pretreatment. The treatment effectiveness values used in this promulgation are derived from the reduced data set using a statistical methodology which assumed its data set was log normally distributed. One day maximum and ten day and 30 day average regulatory values and variability factors are derived directly from the data set. These variability factors are supplied to long term mean values to derive treatment effectiveness for other pollutants. The derivation of the treatment effectiveness values is detailed in Section VII of the technical development document. The Agency performed this analysis to assure itself that performance data from other industries reflects the ability of the technology to achieve the established results in porcelain enameling facilities. Similarly precipitation-sedimentation and filtration technology performance is based on the performance of full scale commercial systems treating multicategory wastewaters which also are essentially similar to porcelain enameling wastewaters. This also is discussed fully in Section VII of the development document.

The limitations and standards established for this category are mass based (mass of pollutant allowed to be discharged per unit of production) and are derived as the product of the regulatory flow and the overall treatment effectiveness. The regulatory flows are derived from sampling and measurement of flows in porcelain enameling manufacturing operations. Because flow reduction is a significant part of the overall pollutant reduction technology, the Agency has concluded that mass based limitations and standards (except for PSES) are necessary to ensure adequate pollution control is achieved.

C. Technology Basis for Final Regulations

A brief summary of the technology basis for the regulation is presented below. A more detailed summary is presented in the "Preamble to the Proposed Porcelain Enameling Point Source Category Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards" (46 FR 8860, January 27, 1981) and the (final) *Development Document for Effluent Limitations Guidelines and Standards for the Porcelain Enameling Point Source Category.*

The technologies outlined below apply to all of the porcelain enameling subcategories, and the final effluent concentrations resulting from the application of the technology are identical for all four subcategories. However, the mass limitations for each subcategory vary due to different water uses among the subcategories and the absence of some pollutants in some subcategories. These water use factors are developed and displayed in Section IX of the technical development document.

The Agency is revising certain monitoring and compliance requirements of the proposed regulation in response to comments. The Agency has reduced the number of pollutants regulated to six metals and three conventional pollutants. This level of control and regulation will effectively ensure that the treatment technology is installed and properly operated. The pollutants not being regulated are metals which are effectively removed by properly operated lime and settle technology and will be removed coincidentally with removal of the regulated pollutants.

Chromium is a regulated pollutant in the aluminum subcategory because it is sometimes used as a metal preparation process chemical and in all subcategories because it may be an ingredient of the slip. However, chromium may not be used in the process or present in the wastewater of many plants. Provision has been made to allow a plant to demonstrate the absence of chromium in its wastewater and be relieved of the necessity of routine monitoring for chromium.

The 30 day average limitations and standards that were proposed have been replaced with a monthly average limitation based on the average of ten consecutive sampling days. The ten day average value was selected as the minimum number of consecutive samples which need to be averaged to arrive at a stable slope on the statistically based curve relating one day and 30 day average values and it approximates the most frequent monitoring requirement of direct discharge permits. Monthly averages based on ten days of data are slightly less stringent than monthly averages based on 30 days of data. The monthly average figures shown in the regulation are to be used by plants with combined

wastestreams that use the "combined wastestream formula" set forth at 40 CFR 403.6(e) and by permit writers in writing direct discharge permits.

BPT: This regulation imposes BPT requirements on the steel, cast iron, and aluminum subcategories. The technology basis for the BPT limitations being promulgated is the same as for the proposed limitations and includes flow normalization, hexavalent chromium reduction (for facilities which perform porcelain enameling on aluminum), oil skimming, pH adjustment, and sedimentation to remove the resultant precipitate and other suspended solids. No discharge of process wastewater pollutants for metal preparation is required in the cast iron subcategory because the metal preparation method usually employed does not result in a discharge of process wastewater. The BPT technology applies to three of the porcelain enameling subcategories. BPT (as well as BAT) limitations are not being promulgated for the copper subcategory because there are no direct dischargers in this subcategory.

The water flow allowances for the steel and aluminum subcategories were increased significantly over the proposed allowances as a result of the public comments and a reexamination of the data. The Agency decided not to use flow data from one plant as part of the basis for BPT after concluding that some of the practices and technology utilized were not practicable as BPT for other plants. As a result of this and other recalculations, the water use factors and BPT effluent limitations and standards for both subcategories were increased. These revised water use factors are developed and displayed in Section IX of the technical development document.

The pollutants selected for regulation at BPT are: chromium, lead, nickel, zinc, aluminum, iron, oil and grease, TSS, and pH. The Agency considered the regulation of several additional pollutants at proposal, but concluded that regulating the selected list of pollutants would adequately insure the installation and proper operation of appropriate control technology and thereby adequately control the remaining pollutants.

Implementation of the BPT limitations will remove annually an estimated 96,700 kg of toxic pollutants and 7,640,000 kg of other pollutants (from estimated current discharge) at a capital cost above equipment in place of $6.3 million and an annual cost of $3.6 million. These costs will be borne by 27 (of the 28) direct dischargers.

The Agency estimates that these costs may result in one plant closure, two production line closures and 59 job losses.

BAT: This regulation imposes BAT requirements on the steel, cast iron and aluminum subcategories. The BAT limitations being promulgated are changed from the proposed BAT limitations. The technology basis for the proposed BAT was flow normalization, chromium reduction, oil & grease removal, and lime, settle and filter treatment. The technology basis for the final regulation is flow normalization, reuse of treated wastewater in most coatings water using operations, chromium reduction, oil & grease removal and lime and settle end-of-pipe treatment.

EPA has removed filtration from the BAT model treatment system and added reuse of process wastewaters. At proposal, the Agency solicited comments on an option that included reuse of water for all coating operations (except for an allowance equal to the amount of water used for ball mill washout) as part of the BAT model treatment system.

Comments on the alternative option stated that the ball mill allowance should be higher than the amount specified in the proposal. Flow reduction by reusing treated wastewater for all coating water needs except ball mill washout is being included as part of the BAT model technology. This will reduce wastewater discharge from coating operations by about 95 percent and the overall wastewater discharge by about 15–18 percent.

Industry comments opposed filtration as a basis for BAT because of its cost and because it could present technological problems for porcelain enamelers whose operations are integrated with operations covered by other regulations.

After considering comments on the proposed regulations, the Agency has decided to delete filtration from the BAT model treatment system. About 60 percent of the existing porcelain enameling plants have waste streams from other categories that are compatible for co-treatment with procelain enameling wastewaters. The Agency considered the technical complications which might be caused by co-treating wastewaters to standards based on different technologies and concluded that requiring filters in porcelain enameling would tend to discourage co-treatment of compatible wastewaters. The Agency also concluded that BAT limitations based on filtration technology would be too costly for existing dischargers. The proposed BAT lime, settle and filter treatment would have had an incremental (above BPT) investment cost of $2.2 million and additional annualized costs of $0.6 million over BPT. Additional (incremental above BPT) toxic pollutants removed by this level of treatment would have been 1,460 kg/yr.

The pollutants selected for regulation are: chromium, lead, nickel, zinc, aluminum and iron. The toxic pollutants considered for regulation at proposal, but not selected for regulation, are antimony, arsenic, cadmium, copper, cyanide and selenium. The technology that would be necessary to meet the limitations for the regulated pollutants will effectively control the unregulated pollutants.

The direct dischargers are expected to move directly to compliance with BAT limitations from existing treatment because the flow reduction used to meet BAT limitations will allow the use of smaller—and less expensive—lime and settle equipment than would be used to meet BPT limitations without flow reduction. This option and the water flow reduction and other pertinent effects are described fully in Section X of the technical development document.

Implementation of the BAT limitations will remove annually an estimated 97,350 kg/yr of toxic pollutants and 7,650,000 kg/yr of other pollutants (from estimated current discharge) at a capital cost above equipment in place of $6.7 million and an annual cost of $3.7 million.

BAT will remove 650 kg/yr of toxic pollutants and 10,000 kg/yr of other pollutants incrementally above BPT; the incremental investment cost is $0.4 million and the additional total annual cost is $0.1 million. These incremental costs are associated with a small change in the cost of production for most product groups (only one-tenth of one percent). The Agency projects no additional plant or line closures as a result of these costs.

NSPS: This regulation establishes NSPS for all four subcategories. The NSPS being promulgated are changed from the NSPS proposed.

The proposed NSPS were based on the following technology: 90 percent reduction of metal preparation wastewater by countercurrent rinsing followed by lime, settle and filter end-of-pipe treatment. Elimination of all coatings wastewater was part of the model treatment technology and was to be achieved by use of electrostatic dry powder coatings, a dry process that eliminates the generation of wastewater. Industry comments opposed eliminating coating wastewater. Many companies stated that powder coatings are not

appropriate for their products because of problems associated with enameling complex shapes and aluminum materials. No adverse comment was received on the countercurrent rinsing and lime, settle and filter end-of-pipe treatment technology proposed for metal preparation wastewater.

We are promulgating NSPS based on multi-stage countercurrent cascade rinsing after each metal preparation operation, reuse of water for most coating operations as is required for BAT, oil and grease removal and lime, settle and filter end-of-pipe treatment technology for all wastewaters. The Agency has eliminated dry electrostatic powder coating as a technology basis for NSPS because this coating is not universally applicable. The application of countercurrent rinsing compensates for the elimination of electrostatic powder coating.

Filtration has been retained in the NSPS model because filters are substantially less costly for new sources after substantial flow reduction than for existing sources. Filtration and flow reduction will remove an estimated 94 percent of the toxic pollutants and nonconventional and conventional pollutants discharged after BAT. The mass of pollutants removed by NSPS treatment and discharged after NSPS treatment for a normal plant are tabulated in Section XI of the development document.

New plants can evaluate the potential for co-treating compatible wastewaters from porcelain enameling and other categories before locating and constructing the porcelain enameling facility. This allows the plant to exercise treatment and location options not usually available to existing sources. For plants with a high proportion of non-porcelain enameling wastewater, such as metal finishing, this may allow co-treatment of the wastewater and meeting the applicable limitations without filtering the combined wastewater stream. In other cases new plants with a high proportion of porcelain enameling wastewaters may find it necessary to treat the porcelain enamel wastewater separately. In estimating the cost for new sources, it has been assumed that there would be no co-treatment of wastewater; co-treatment using larger equipment in a combined treatment system should reduce the total cost for the new plant below cost of separate treatment of each wastestream. Even if no co-treatment occurs the cost of complying with NSPS will not inhibit the construction of new porcelain enameling facilities. Accordingly, EPA has determined that these additional costs are justified.

The pollutants regulated are: Chromium, lead, nickel, zinc, aluminum, iron, oil and grease TSS and pH. The capital investment for new sources to meet NSPS is about 7 percent above that needed by existing sources to comply with BAT. Since these costs would represent less than 0.5 percent of expected revenues, NSPS are not expected to result in any barrier to entry into the category.

PSES: This regulation establishes PSES for the steel, cast iron and aluminum subcategories. The technology used as a basis for developing PSES standards is identical to the technology for BAT. In establishing pretreatment standards, EPA considers whether pollutants interfere with, pass-through or otherwise are incompatible with the POTW. EPA determined there is pass-through of toxic metal pollutants because POTW removals of major toxic pollutants found in porcelain enameling wastewater average about 50 percent (Cr-18%, Cu-58%, CN-52%, Zn-65%) while BAT technology treatment removes more than 99 percent of these pollutants. This difference in removal effectiveness clearly indicates pass-through of pollutants will occur unless porcelain enameling wastewaters are adequately pretreated. The pollutants to be regulated by PSES include chromium, lead, nickel, and zinc.

The Agency proposed PSES using technology analogous to the proposed BAT; flow normalization, chromium reduction, and lime, settle and filter end-of-pipe treatment. For the reasons discussed under BAT we are removing filtration from the PSES model technology and adding reuse of process wastewater. The model technology on which the promulgated PSES is based is analogous to the promulgated BAT model technology; flow reduction by reuse of treated process wastewater, chromium reduction, and lime and settle end-of-pipe treatment. The proposed PSES would have cost $4.8 million capital cost, $1.4 million annualized cost and removed 1,500 kg/yr toxic pollutants more than the PSES being promulgated.

The Agency determined that PSES are not economically achievable for small plants. Application of PSES to all indirect dischargers would have resulted in eight plant closures predominately among plants which produce less than 1,600 m^2/day product and discharge less than 60,000 l/day. EPA determined that this would present a disproportionate impact on this segment of the category. Accordingly, these plants are not controlled by the categorical standards established by this regulation. All indirect discharging plants must, however, conform to the provisions of 40 CFR Part 403. The exclusion point is reasonable since the next projected plant closure is about twice the cutoff level. This cut-off exempts from the categorical PSES regulation 38 small indirect dischargers which represent about 5 percent of the total industry production and 7 percent of the production by indirect dischargers. Further details of the small plant analysis are presented in the economic analysis document.

The Agency has determined that there is no less stringent technology that could be the basis of pretreatment standards for small plants. EPA evaluated a less expensive, sump settling technology suggested by public comments for small indirect dischargers. However, the Agency determined that this technology has not been adequately demonstrated in the industry and probably would not appreciably reduce the discharge of toxic pollutants.

The 38 small indirect dischargers not regulated by this PSES generate 21,800 kg/yr toxic pollutants and 1,426,000 kg/yr other pollutants. If PSES applied to these facilities they would introduce into POTW only 605 kg/yr toxic pollutants and 8,500 kg/yr other pollutants.

Concentration based standards, rather than the proposed mass-based standards, are promulgated for PSES with mass-based alternate standards made available for use where desired by the POTW. The Agency recognizes that concentration based standards may be more easily implemented and in this specific case resulting additional pollutant discharge will not be substantial.

Implementation of the PSES standards will remove annually an estimated 179,500 kg of toxic pollutants and 14,200,000 kg of other pollutants (from estimated current discharge) at a capital cost above equipment in place of $18.7 million and an annual cost of $9.9 million.

The pollutants selected for regulation are: chromium, lead, nickel, zinc, aluminum and iron. The toxic pollutants considered for regulation at proposal, but not selected for regulation, are antimony, arsenic, cadmium, copper, cyanide and selenium. The technology that would be necessary to meet the limitations for the regulated pollutants will effectively control the unregulated pollutants.

We expect that 50 of the 88 indirect dischargers will incur costs to comply

with PSES. The Agency estimates that those costs may result in two plant closures, two production line closures, and 90 job losses.

The Agency has considered the time for compliance for PSES. Few if any of the porcelain enameling plants have installed and are properly operating the treatment technology for PSES. Additionally, the readjustment of internal processing conditions to achieve reduced wastewater flows may require more time than for only the installation of end-of-pipe treatment equipment. Additionally, many plants in this and other industries will be installing the treatment equipment suggested as model technologies for this regulation and this may result in delays in engineering, ordering, installing, and operating this equipment. For all these reasons, the Agency has decided to set the PSES compliance date at three years after promulgation of this regulation.

PSNS: This regulation establishes PSNS for all four subcategories. The treatment technology basis for the PSNS being promulgated is identical to the treatment technology set forth as the basis for the NSPS being promulgated.

This regulation establishes mass-based standards. Although mass-based standards may be somewhat more difficult for a POTW to enforce, mass-based standards are necessary for PSNS to ensure that the considerable effluent-reduction benefits of flow reduction techniques are obtained. Overall flow and pollutant reduction of about 90 percent can be achieved by countercurrent cascade rinsing, and countercurrent cascade rinsing is not excessively costly in new plants. Since POTW removal of toxic pollutants is only about 50 percent, pass-through of toxic pollutants will occur.

The incremental capital investment (above the capital that would have been required if PSES requirements applied) for new source standards is less than 0.5 percent of expected revenues and is not expected to result in any barrier to entry into the category.

Regulated pollutants at PSNS are chromium, lead, nickel and zinc.

VI. Costs and Economic Impacts

Executive Order 12291 requires EPA and other agencies to perform regulatory impact analysis of major rules. Major rules are defined as rules that impose an annual cost to the economy of $100 million or more, or meet other economic impact criteria. On the basis of these criteria, EPA does not consider this final regulation to be a major rule. This rulemaking satisfies the requirements of the Executive Order for a non-major rule.

The economic impact assessment is presented in *Economic Impact Analysis of Effluent Standards and Limitations for the Porcelain Enameling Industry,* EPA 440/2-82-005. The analysis details the investment and annual costs that the industry will incur as result of this regulation. The report assesses the impact of effluent control costs in terms of price changes, production changes, plant closures, and unemployment effects.

Since proposal, the economic impact analysis has been revised to reflect several changes. Revised compliance costs are based on a modified computer cost model program. These compliance costs are engineering estimates for the effluent control systems described earlier in this preamble. Compliance cost estimates account for the equipment in place at each plant. The revised cost estimates address many of industry's comments on the proposal. A discussion of the revisions to the cost model is presented in Section VIII of the development document. In addition, these costs reflect the conclusion that porcelain enameling process wastewater treatment sludges generated by the model technology will not be hazardous wastes, as defined in the Resource Conservation and Recovery Act. The appropriate sludge disposal costs are included in the economic analysis document. The analysis also reflects other industry comments and additional information provided since proposal and uses more current information on financial and economic characteristics of the industry. For example, the cost of capital used in the analysis reflects a 16 percent interest rate.

EPA has identified 116 plants that perform porcelain enameling operations. Total investment cost for existing dischargers (BAT and PSES combined) is estimated to be $25.3 million, with annual costs of $13.6 million, including depreciation and interest. These costs are expressed in 1982 dollars (updated from 1978 dollars using a construction cost index) and are based on the determination that plants will move from existing treatment to either BAT or PSES. The major economic impacts projected as a result of this regulation are three plant closures and 149 job losses—substantially less than one percent of total employment for plants conducting porcelain enameling. Maximum increases in cost of production range from 0.1 to 2.6 percent. Balance of trade effects are not significant.

The Agency concludes that the final regulation is economically achievable, and the impacts are justified in light of the effluent reductions achieved.

In order to measure the potential economic impacts, the industry was subcategorized by the type of product being enameled (e.g., ranges, sanitary ware, architectural panels). The analytical approach includes a financial analysis of 106 individual plants that focused on profitability and capital requirements. Specific closure projections are characterized as "plant closures" when an entire facility is expected to stop operations and as "line closures" when only the porcelain enameling functions are expected to close. In the latter case, the porcelain enameling operations are not the major production activity at the plant, and other activities would not be directly affected by this regulation.

BPT: Investment requirements for 27 direct dischargers are $6.3 million, and total annualized costs are $3.6 million. The major impacts associated with the costs of the BPT treatment option are one plant closure and two production line closures. The potential closures will affect 59 employees.

BAT: The incremental investment costs of BAT over BPT are $0.4 million, and the additional annualized costs are $0.1 million. The analysis projects no additional plant closures or production line closures. The incremental compliance costs results in additional costs of production of only 0.1 percent.

PSES: The final categorical pretreatment standards will affect approximately 50 of the 88 indirect dischargers (57 percent). Investment costs are $18.7 million, and total annualized costs are $9.9 million. Under the proposed regulation, all indirect dischargers would have been subject to PSES. The final categorical PSES, however, applies only to indirect dischargers with flow greater than 60,000 1/day or production over 1,600 mL/day. This change is necessary to avoid excessive economic impact on this segment of the industry. If all indirect dischargers were required to meet the final PSES, the analysis of compliance costs projects 8 plant closures and 10 line closures, with unemployment of 429. Instead, the impacts of PSES are two plant closures (2 percent of indirect dischargers) and two line closures. The potential closures will affect 90 employees, which represents 0.1 percent of total employment for indirect dischargers.

NSPS and PSNS: An analysis of new source standards uses a model plant research approach. The incremental investment cost of the NSPS and PSNS limitations for the model plant would be $0.15 million; the annualized cost would be $0.04 million. The new source

analysis focuses on two parameters: (1) Annual compliance costs as a percent of expected revenues and (2) capital investment as a percent of revenues. In both cases, the results indicate that the incremental costs of new source standards are relatively low. For all subcategories, the first ratio is 0.1 percent; results for the second ratio are less than 0.5 percent. Thus, new source standards are not expected to present barriers to entry into the industry.

Regulatory Flexibility: Public Law 96-354 requires that a Regulatory Flexibility Analysis (RFA) be prepared for regulations that have a significant impact on a substantial number of small entities. An RFA for this regulation is included as part of the economic impact analysis. The Agency has concluded that this regulation will not have a significant impact on a substantial number of small entities. In the preamble to the proposed rule (46 FR 8868), the Agency solicited comment on the issue of small plant impacts. Based on the industry's comments and additional economic analysis, the industry was divided into size segments according to flow rate, number of employees, and value of shipments. The economic impacts were found to be concentrated on small indirect discharge plants. The Agency considered, but was unable to identify, less costly technologies than the selected PSES option that would remove significant amounts of toxic pollutants. The sump settling option suggested by the industry was not determined to be reliably effective. Thus, the only way to avoid the severe economic impact on small plants was to make the pretreatment standards for this regulation applicable to the large plants only. This approach effectively excludes indirect dischargers with flow rates under 60,000 l/day (15,850 gal/day) that produce less than 1,600 m^2/day (17,220 ft^2) from this catergorical pretreatment standard.

VII. Non-Water-Quality Environmental Impacts

Eliminating or reducing one form of pollution may cause other environmental problems. Sections 304(b) and 306 of the Act require EPA to consider the non-water-quality environmental impacts (including energy requirements) of certain regulations. In compliance with these provisions, we considered the effect of this regulation on air pollution, solid waste generation, water scarcity, and energy consumption. While it is difficult to balance pollution problems against each other and against energy use, we believe that this regulation will best serve often competing national goals.

This regulation was circulated to and reviewed by EPA personnel responsible for non-water quality programs.

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

A. Air Pollution

Imposition of BPT and BAT limitations and NSPS, PSES, and PSNS will not create any substantial air pollution problems. The technologies used as the basis for this regulation precipitate pollutants found in wastewater which are then settled or filtered from the discharged wastewater. These technologies do not emit pollutants into the air.

B. Solid Waste

We estimate that porcelain enameling facilities generated 30,000 kkg/yr of solid wastes (wet basis) in 1976. These wastes are comprised of wastewater treatment system sludges containing toxic metals, including chromium, copper, lead, nickel and zinc. We estimate that the BPT limitations will contribute an additional 47,100 kkg/yr of solid wastes. BAT and PSES will increase these wastes by approximately 360 kkg/yr beyond BPT levels. We estimate PSES will contribute 88,000 kg/yr solid waste above the 20,000 kg solid waste currently discharged. These sludges will necessarily contain additional quantities (and concentrations) of toxic metal pollutants.

Wastewater treatment sludges from this category are expected to be non-hazardous under RCRA when generated using the model technology. Treatment of similar wastewaters from other categories using this technology has resulted in non-hazardous sludges. Costs for disposal of non-hazardous wastes are included in the annual costs

For new sources, we estimate that a new normal plant in the steel subcategory will generate 1,700 kkg/yr solid waste.

C. Consumptive Water Loss

Treatment and control technologies that require extensive recyling and reuse of water may require cooling mechanisms. Evaporative cooling mechanisms can cause water loss and contribute to water scarcity problems—a primary concern in arid and semi-arid regions. While this regulation assumes some water reuse the overall amount of reuse is low (below 50 percent) and the quantity of water involved is not significant. We conclude that the consumptive water loss is insignificant and that the pollution reduction benefits of recycle technologies outweigh their impact on consumptive water loss.

D. Energy Requirements

We estimate that the achievement of BPT effluent limitatons will result in a net increase in electrical energy consumption of approximately 16.7 million kilowatt-hours per year. BAT limitations are projected to add another 15.1 million kilowatt-hours to electrical energy consumption. To achieve the BPT and BAT effluent limitation, a typical direct discharger will increase total energy consumption by less than one percent one percent of the energy consumed for production purposes.

The Agency estimates that PSES will result in a net increase in electrical energy consumption of approximately 11.3 million kilowatt-hours per year. To achieve PSES, a typical existing indirect discharger will increase energy consumption less than one percent of the total energy consumed for production purposes.

The energy requirements for new sources (both NSPS and PSES) are similar to the BAT energy requirements. For a new normal plant in the steel subcategory the net increase in energy from water pollution control would be 0.28 million kilowatt-hours per year, less than one percent of the plants total energy consumption.

VIII. Pollutants and Subcategories Not Regulated

The Settlement Agreement contains provisions authorizing the exclusion from regulation, in certain circumstances, of toxic pollutants and industry subcategories.

A. Exclusion of Pollutants

Paragraph 8(a)(iii) of the Revised 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. The toxic pollutants not detected and therefore, excluded from regulation are listed in Appendix B to this notice—first those excluded from all subcategories, then by subcategory those not excluded in all subcategories.

Paragraph 8(a)(iii) allows the Administrator to exclude from regulation toxic pollutants detected in amounts too small to be effectively reduced by technologies known to the Administrator. Appendix C to this notice lists the toxic pollutants in each subcategory which were detected in amounts at or below the nominal limit of analytical quantification, which are too small to be effectively reduced by

technologies and which, therefore, are excluded from regulation.

Paragraph 8(a)(iii) allows the Administrator to exclude from regulation toxic pollutants detectable in the effluent from only a small number of sources within the subcategory which are uniquely related to those sources. Appendix D to this notice lists for each subcategory the toxic pollutants which were detected in the effluents of only a small number of plants which are uniquely related to that plant, and are not related to the manufacturing processes under study.

Paragraph 8(a)(iii) also allows the Administrator to exclude from regulation, toxic pollutants present in amounts too small to be effectively reduced by technologies considered applicable to the category. Appendix E lists those toxic pollutants found in quantifiable amounts which are not treatable using the technologies considered.

Paragraph 8(a)(iii) also allows the Administrator to exclude from regulation toxic pollutants which will be effectively controlled by the technologies used as the basis for other effluent limitations and guidelines, standards of performance, or pretreatment standards. Appendix F list those toxic pollutants which will be effectively controlled by the BAT limitations or PSES standards being promulgated even though they are not specifically regulated.

B. Exclusion of Subcategories

BPT and BAT limitations are not being promulgated for the copper basis material subcategory because there are no direct discharging plants in this subcategory. PSES is not being promulgated because the only copper basis material manufacturing plants that discharge to POTW are excluded from the categorical standards established by this regulation by the small plant exclusion.

No limitations are established for porcelain enameling on precious metals (gold, silver and platinum group metals) because as previously stated they are believed to be very small sources and virtually all would be excluded from regulation by the small indirect discharger exemption.

IX. Public Participation and Responses to Major Comments

Numerous agencies and groups have participated during the development of these effluent guidelines and standards. Following the publication of the proposed rules on January 27, 1981 in the **Federal Register**, we provided the technical development document and the economic document supporting the proposed rules to industry, government agencies, and the public sector for comments. A workshop was held on the Porcelain Enameling BAT Rulemaking in Washington, D.C., on April 15, 1981. On April 16, 1981, in Washington, D.C., a pretreatment public hearing was held at which 18 persons presented testimony.

The comment period was scheduled to close on April 27, 1981 but was extended to May 8, 1981. Fifty-one responses containing 274 comments on the proposed regulation were received from the following: Alliance Wall, Corp.; Bootz Manufacturing Co, Inc.; Bootz Plumbing Fixtures Inc.; Caloric Corp.; California Metal Enameling Co.; Chi-Vit Corp., Roy C. Cobb; County Sanitation Districts of Los Angeles; Erie Ceramic Arts Co.; Ervite Corp.; Ferro Enameling Co.; Ferro Corp.; General Housewares Corp.; Hobart Corporation; Jenn-Air Corp.; Macola, Inc.; Magic Chef West; Mansfield Products; The Maytag Company; GII Corp.; Mirawall; Mirro Corp.; Mobay Chemical; The O. Hommel Co.; Office of the Governor, Indiana; Porcelain Industries, Inc., Porcelain Metals Corp., A. O. Smith Corp., A. O. Smith Harvestore Products Inc.; Southwestern Porcelain Inc.; State Industries Inc.; Vitreous Steel Products Co.; Wear-Ever Aluminum Inc; Weber-Stephen Products Co.; The West Bend Co.; Whirlpool Corp.; White Consolidated Industries; Porcelain Enamel Institute, Inc., private individual.

All comments received have been carefully considered, and appropriate changes in the regulation have been made whenever available data and information supported those changes. Major issues raised by the comments are addressed in this section of the preamble and in the public record. A summary of the comments received and our detailed responses are included in a document entitled "Public Comments and Responses for Porcelain Enameling" which has been placed in the public record for this regulation.

A. Economic Impact of the Regulation

Many comments expressed concern that the proposed regulation would be too expensive and cause many plants, especially small plants, to close. As discussed above, in response to comments EPA has decided to promulgate less stringent PSES and BAT than were proposed; small indirect dischargers need not comply with categorical PSES, and filtration has been deleted from the BAT and PSES model technologies.

The Agency's revised economic impact analysis projects that among the direct dischargers, one plant and two production lines may close, with unemployment of 0.3 percent, as a result of complying with BAT requirements. For indirect dischargers, the projected closures are two plants and two production lines with unemployment of 0.1 percent. The Agency believes that these economic impacts are justified in light of the effluent reduction benefits of this regulation.

B. Impact of the Regulation on Integrated Plants

Several commenters asserted that EPA has failed to account for the additional compliance cost of the proposed regulation on integrated plants with combined wastestreams. The commenters believe that plants with combined wastestreams would require treatment of the entire plant discharge to the limits for porcelain enameling; they believe that the cost of line segregation is prohibitive.

The cost of compliance and technological ramifications of this regulation on integrated plants has been fully considered. The Agency's analysis of the economic impact of the regulation includes the cost of segregating porcelain enameling wastewater from other process wastes with separate treatment of the porcelain enameling wastewater. Cotreatment of porcelain enameling wastewaters with other process wastewaters would reduce the cost below these estimates for porcelain enameling alone.

The Agency is aware that many plants prefer not to segregate wastes in order to take advantage of economies of scale in treatment costs. The Agency has not performed an analysis of the cost of combined treatment for integrated porcelain enameling plants, but we expect combined treatment to be less costly than separate treatment of each wastewater stream. However, the Agency has performed an analysis of combined treatment by metal finishers, and at least 35 percent of the porcelain enamelers with combined wastestreams are included in the metal finishing estimates. Since none of these plants are indicated as closures in the metal finishing economic study, these estimates for metal finishing indicate that the cost of combined treatment will not result in closures among porcelain enamelers.

As noted previously, the Agency deleted filtration from the BAT and PSES model technologies in part to reduce barriers to co-treatment of compatible wastewaters.

C. Calculation of Achievable Concentrations

Several comments object to limits more stringent than those that apply to electroplaters (40 CFR Part 413) based on the use of multiple industry data pooling, which included electroplating data, to determine achievable concentrations following treatment. Industry comments suggest that the proposed concentrations are not achievable with the precipitation technology. The commenters asserted that data pooling was not reasonable because of greater concentrations of some pollutants in porcelain enamelers' raw waste.

The effluent characteristics of the six catetories that were used to derive the pooled performance data were believed to be sufficiently homogeneous to justify this approach. However, as discussed previously in this preamble, a statistical analysis performed after proposal shows that the effluent from porcelain enameling is different from that of electroplating. Therefore, the recommended effluent limitations for promulgation are based on a pooled industry data base that excludes electroplating. These limitations are based on a revised statistical analysis that better represents the effectiveness and variability of the treatment technology in porcelain enameling facilities. Although the recommended limits are more stringent than electroplating limits based on a similar technology the Agency's rinsed data based demonstrated that porcelain enamelers can meet these limits. Section VII of the Development Document explains revisions in the concentrations used to calculate the limitations and standards in the final regulation.

D. Number of Pollutants Regulated

Several comments stated that the 19 pollutants proposed for regulation were unnecessary additions to compliance monitoring costs. The comments suggest that the limits for nontoxic, nonconventional pollutants be eliminated.

The Agency has reconsidered the number of pollutants to be regulated and decided that it is unnecessary to establish limits for all pollutants. A model treatment system meeting the limitations or key pollutants will provide adequate removal of all pollutants which can be treated by the technology. As a result of this reconsideration, we reduced the number of regulated pollutants to nine (chromium, lead, nickel, zinc, aluminum, iron, oil and grease, TSS, and pH) for direct dischargers and four (chromium, lead, nickel, zinc) for indirect dischargers. This reduced number of regulated pollutants is expected to ensure adequate removal of all pollutants in porcelain enameling wastewaters. Aluminum and iron are not regulated in pretreatment because these elements, which are sometimes added by the POTW as coagulants, are not expected to pass through the POTW.

E. Accuracy of Treatment Cost Estimates

Comments on the treatment cost estimates presented in the proposed regulation suggest that EPA had underestimated the cost of compliance by at least 100 percent, not including the costs of combined treatment. Among other things, the comments criticized design criteria for equipment and the Agency's estimates of the cost of installing equipment.

Approximately 70 percent of the difference between the original EPA costs and industry costs is explained by inflation and the industry's inclusion of equipment sized for flows larger than those necessary based on our study. Some industry plant cost estimates also included backup equipment such as redundant pumps and emergency storage basins to ensure that a catastrophic treatment plant breakdown will not force a plant shutdown. The Agency does not believe storage basins and redundant pumps are appropriate or common industry practice for the relatively simple treatment technologies recommended for this category. The Agency's cost estimate omits the 5 to 10 percent additional cost of this backup equipment but includes 20 to 40 percent excess tank capacity to accommodate flow surges and short term (less than one day) equipment breakdowns.

In addition to the cost of the back-up equipment, a 20 to 30 percent difference still remains between EPA's cost estimates and the industry's. The major items that account for the difference are site specific costs such as land acquisition and site improvements. While these costs are easily calculated for an individual plant, they are highly variable from plant to plant. As a result, the Agency has not included these costs. However, site specific costs have been taken into account by a sensitivity analysis in the economic impact analysis which examined the potential economic impact of a 30 percent increase in compliance costs. This analysis showed that only one additional line closure would result from this increase.

F. Effect of Sampling Frequency on Achievable Limits

Two industry commenters were critical of the proposal of 30 day average limitations. They point out that the limits are based on 30 samples collected per month. The commenters believe that collecting 30 samples per month was unnecessarily expensive. Instead, the comments suggest that the Agency issue limits based on less frequent sampling, such as four days per month.

The final regulation establishes monthly average limits that are based on the average of ten consecutive sampling days (not necessarily consecutive calendar days). The Agency believes that the monthly average limits based on ten-day averages eliminate unnecessary costs to industry while they assure retention of most all of the effluent reduction benefits that the 30-day averages would have achieved. The Agency rejected shorter time periods for averaging into a monthly average because they do not reasonably approximate the averaging of daily values over one month and because shorter time periods such as a four day average used for a monthly average would allow much greater discharges of pollutants. To assure implementation of this new monthly average the Agency is requiring that the monthly average set forth in this regulation be used as the basis for monthly limits in permits and in pretreatment standards.

X. Best Management Practices

Section 304(e) of the Clean Water Act gives the Administrator authority to prescribe "best management practices" (BMP). However, EPA at this time is not considering development of BMP specific to the porcelain enameling category.

IX. Upset and Bypass Provisions

A recurring issue of concern has been whether industry guidelines should include provisions authorizing noncompliance with effluent limitations 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. It has been argued that an upset provision in EPA's effluent limitations is necessary because such upsets will inevitably occur even in properly operated control equipment. Because technology based limitations require only what technology can achieve, it is claimed that liability for such situations is improper. When confronted with this issue, courts have disagreed on 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* v. *Costle, supra*, and *Corn Refiners Association, et al.* v. *Costle*, No. 78–1069 (8th cir., April 2, 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).

An upset is an unintentional episode during which effluent limits are exceeded; a bypass however, is an act of intentional noncompliance during which waste treatment facilities are circumvented in emergency situations. We have, in the past, included bypass provisions in NPDES permits.

We determined that both upset and bypass provisions should be included in NPDES permits and have promulgated consolidated permit regulations that include upset and bypass permit provisions (See 40 CFR 122.60, 45 FR 33290 (May 19, 1980). The upset provision established an upset as an affirmative defense to prosecution for violation of technology-based effluent limitations. The bypass provision authorizes bypassing to prevent loss of life, personal injury, or severe property damage. Consequently, although permittees in the porcelain enameling industry will be 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 this regulation, the effluent limitations for the appropriate subcategory must be applied in all federal and state NPDES permits thereafter issued to direct dischargers in the porcelain enameling category. In addition, on promulgation, the pretreatment limitations are directly applicable to any indirect dischargers.

For the BPT effluent limitations, the only exception to the binding limitations is EPA's "fundamentally different factors" variance. See *E. I. du Pont de Nemours & Co.* v. *Train*, 430 U.S. 112 (1977); *Weyerheuser Co.* v. *Costle, supra*. This variance recognizes factors concerning a particular discharger that are fundamentally different from the factors considered in this rulemaking. Although this variance clause was set forth in EPA's 1973–1976 industry regulations, it is now included in the NPDES regulations and will not be included in the procelain enameling or other industry regulations. See the NPDES regulations at 40 CFR Part 125, Subpart D.

The BAT limitations in this regulation are also subject to EPA's "fundamentally different factors" variance. BAT limitations for nonconventional pollutants are subject to modifications 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 43 FR 40895 (September 13, 1978). Pretreatment standards for existing sources are subject to the "fundamentally different factors" variance and credits for pollutants removed by POTW. (See 40 CFR 403.7, 403.13).

The economic modification section (301(c)) gives the Administrator authority to modify BAT requirements for nonconventional pollutants[1] for dischargers who file a permit application after July 1, 1978, upon a 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, persistency 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 application for modifications under section 301 (c) or (g) must be filed within 270 days after the promulgation of an applicable effluent guideline. Initial applications must be filed with the Regional Administrator and, in those States that participate in the NPDES Program, a copy must be sent to the Director of the State program. Initial applications to comply with 301(j) must include the name of the permittee, the permit and outfall number, the applicable effluent guideline, and whether the permittee is applying for a 301(c) or 301(g) modification or both.

XIII. Relationship to NPDES Permits

The BPT and BAT limitations and NSPS in this regulation will be applied to individual porcelain enameling facilities through NPDES permits issued by EPA or approved state agencies, under Section 402 of the Act. As discussed in the preceding section of this preamble, these limitations must be applied in all Federal and State NPDES permits except to the extent that variances and modifications are expressly authorized. Other aspects of the interaction between these limitations and NPDES permits are discussed below.

One issue that warrants consideration is the effect of this regulation on the powers of NPDES permit-issuing authorities. The promulgation of this regulation does not restrict the power of any permitting authority to act in any manner consistent with law or these or any other EPA regulations, guidelines, or policy. For example, even if this regulation does not control a particular pollutant, the permit issuer may still limit such pollutant on a case-by-case basis when limitations are 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 limitations on covered pollutants), such limitations must be applied by the permit-issuing authority.

A second topic that warrants discussion is the operation of EPA's NPDES enforcement program, many aspects of which were considered in developing this regulation. We emphasize that although the Clean Water Act is a strict liability statute, the initiation of enforcement proceedings by

[1] Section 301(a) precludes the Administrator from modifying BAT requirements for any pollutants which are on the toxic pollutant list under Section 307(1)(1) of the Act.

EPA is discretionary. We have exercised and intend to exercise that discretion in a manner that recognizes and promotes good-faith compliance efforts.

XIV. Availability of Technical Information

The basis for this regulation is detailed in four major documents. Analytical methods are discussed in *Sampling and Analysis Procedures for Screening of Industrial Effluent for Priority Pollutants.* EPA's technical conclusions are detailed in *Development Document for Effluent Guidelines, New Source Performance Standards and Pretreatment Standards for the Porcelain Enameling Point Source Category.* The Agency's economic analysis is presented in *Economic Impact Analysis of Effluent Limitations and Standards for the Porcelain Enameling Industry.* A summary of the public comments received on the proposed regulation is presented in a report *Responses to Public Comments, Proposed Porcelain Enameling Industry Effluent Guidelines and Standards,* which is a part of the public record for this regulation.

Technical information may be obtained by writing to Ernst P. Hall, Effluent Guidelines Division (WH-552), EPA, 401 M Street, SW., Washington, D.C. 20460, or through calling (202) 382-7126.

Additional information concerning the economic impact analysis may be obtained from Ms. Debra Maness, Economic Analysis Staff (WH-586), EPA, 401 M Street, SW., Washington, D.C. 20460 or by calling (202) 382-5385.

Copies of the technical and economic documents may be obtained from the National Technical Information Service, Springfield, Virginia 22161 (703/487-4600).

The regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291. Any comments from OMB to EPA and any EPA response to those comments are available for public inspection at Room M2404, U.S. EPA, 401 M Street, SW., Wash., D.C. 20460 from 9:00 a.m. to 4:00 p.m. Monday-Friday excluding federal holidays.

In accordance with the Paperwork Reduction Act of 1980 (Pub. L. 96-511), the reporting or recordkeeping provisions that are included in this regulation will be submitted for approval to the Office of Management and Budget (OMB). They are not effective until OMB approval has been obtained and the public notified to that effect through a technical amendment to this regulation.

List of Subjects in 40 CFR Part 466

Porcelain enameling, Steel basis metal, Aluminum basis metal, Cast iron basis metal, Copper basis metal, Enamel slip.

Dated: November 5, 1982.

Anne M. Gorsuch,

Administrator.

APPENDICES

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

Act—The Clear Water Act.

Agency—The U.S. Environmental Protection Agency.

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

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

BMPs—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 facility which discharges or may discharge pollutants into waters of the United States.

Indirect discharger—A facility which discharges or may discharge 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. 94-580) of 1976, Amendments to Solid Waste Disposal Act.

Appendix B—Toxic Pollutants Not Detected in Wastewaters

(a) Toxic Pollutants Not Detected in Wastewaters of Any Subcategory

001 Acenaphthene
002 Acrolein
003 Acrylonitrile
004 Benzene
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
011 1,1,1-trichlorethane
012 Hexachloroethane
013 1,1-dichloroethane
014 1,1,2-trichloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
017 Bis (chloromethyl) ether
018 Bis (2-chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
021 2,4,6-trichlorophenol
022 Parachlorometa cresol
023 Chloroform (trichloromethane)
024 2-chlorophenol
025 1,2-dichlorobenzene
026 1,3-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
029 1,1-dichloroethylene
030 1,2-trans-dichloroethylene
031 2,4-dichlorophenol
032 1,2-dichloropropane
033 1,2-dichloropropylene (1,3-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
038 Ethylbenzene
039 Fluoranthene
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether
042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxy) methane
044 Methylene chloride (dichloromethane)
045 Methyl choride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
048 Dichlorobromomethane
049 Trichlorofluoromethane
050 Dichlorodifluoromethane
051 Chlorodibromomethane
052 Hexachlorobutadiene
053 Hexachloromyclopentadiene
054 Isophorone
055 Naphthalene
056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamine
064 Pentachlorophenol
065 Phenol
067 Butyl benzyl phthalate
068 Di-N-Butyl Phthalate
070 Diethyl Phthalate
071 Dimethyl phthalate
072 1,2-benzanthracene (benzo(a)anthracene)
073 Benzo(a)pyrene (3,4-benzopyrene)

074 3,4-Benzofluoranthene (benzo(b)fluoranthene)
075 11,12-benzofluoranthene (benzo(b)fluoranthene)
076 Chrysene
077 Acenaphthylene
078 Anthracene
079 1,12-benzoperylene (benzo(ghi) perylene)
081 Phenanthrene
082 1,2,4,5,6-dibenzanthracene (dibenzo(,h)anthracene)
083 Ideno(1,2,3-cd) pyrene (2,3-O-phenylene pyrene)
084 Pyrene
085 Tetrachloroethylene
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Edosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
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)
113 Toxaphene
116 Asbestos
123 Mercury
126 Silver
127 Thallium
129 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

(b) Toxic Pollutants Not Detected in Wastewaters of the Steel Basis Material Subcategory

014 1,1,2-trichloroethane
066 Bis(2-ethylhexyl)phthalate
069 Di-n-octyl phthalate
080 Fluorene
086 Toluene
121 Cyanide, Total

(c) Toxic Pollutants Not Detected in Wastewaters of the Cast Iron Basis Material Subcategory

014 1,1,2-trichloroethane
069 Di-n-octyl phthalate
080 Fluorene
086 Toluene
087 Trichloroethylene
121 Cyanide, Total

(d) Toxic Pollutants Not Detected in Wastewaters of the Aluminum Basis Material Subcategory

014 1,1,2-trichloroethane
080 Fluorene
086 Toluene
087 Trichloroethylene

(e) Toxic Pollutants Not Detected in Wastewaters of the Copper Basis Material Subcategory

066 Bis(2-ethylhexyl)phthalate
069 Di-n-octyl phthalate
087 Trichloroethylene
121 Cyanide, Total

Appendix C—Toxic Pollutants Detected Below the Analytical Quantification Limit

(a) Steel Basis Material Subcategory

087 Trichloroethylene

(b) Cast Iron Basis Material Subcategory

None

(c) Aluminum Basis Material Subcategory

None

(d) Copper Basis Material Subcategory

014 1,1,2-trichloroethane
080 Fluorene
086 Toluene
087 Trichloroethylene

Appendix D—Toxic Pollutants Found in a Small Number of Plants

(a) Steel Basis Material Subcategory

117 Beryllium

(b) Cast Iron Basis Material Subcategory

117 Beryllium

(c) Aluminum Basis Material Subcategory

117 Beryllium

(d) Copper Basis Material Subcategory

117 Beryllium

Appendix E—Toxic Pollutants Found in Quantifiable Amounts Which Are Not Treatable Using Technologies Considered

(a) Steel Basis Material Subcategory

None

(b) Cast Iron Basis Material Subcategory

None

(c) Aluminum Basis Material Subcategory

066 Bis(2-ethylhexyl) phthalate
069 Di-n-octyl phthalate
121 Cyanide

(d) Copper Basis Material Subcategory

None

Appendix F—Toxic Pollutants Which Will Be Effectively Controlled by the BAT Limitations or PSES Standards Promulgated Even Though They Are Not Specifically Regulated

(a) Steel Basis Material Subcategory

114 Antimony
115 Arsenic
118 Cadmium
120 Copper
125 Selenium

(b) Cast Iron Basis Material Subcategory

114 Antimony
115 Arsenic
118 Cadmium
120 Copper
125 Selenium

(c) Aluminum Basis Material Subcategory

114 Antimony
115 Arsenic
118 Cadmium
120 Copper
125 Selenium

(d) Copper Basis Material Subcategory

114 Antimony
115 Arsenic
118 Cadmium
120 Copper
125 Selenium

A new Part 466 is added to read as follows:

PART 466—PORCELAIN ENAMELING POINT SOURCE CATEGORY

General Provisions

Sec.
466.01 Applicability.
466.02 General definitions.
466.03 Monitoring and reporting requirements.
466.04 Compliance date for PSES.

Subpart A—Steel Basis Material Subcategory

466.10 Applicability; description of the steel basis material subcategory.
466.11 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
466.12 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
466.13 New source performance standards.
466.14 Pretreatment standards for existing sources.

Sec.

Authority: Secs. 301, 304 (b), (c), (e), and (g), 306 (b) and (c), 307 and 501 of the Clean Water Act (the 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), and 1361; 86 Stat. 816, Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

General Provisions

§ 466.01 Applicability.

(a) Except as provided in paragraphs (b) and (c) of this section, the provisions of this part apply to any porcelain enameling facility which discharges pollutants to waters of the United States or introduces pollutants into a publicly owned treatment works.

(b) Any existing porcelain enameling facility which prepares or coats less than 1600 m^2/day and which introduces less than 60,000 1/day of wastewater into a publicly owned treatment works is not controlled by the pretreatment standards for existing sources established by this regulation. Such facilities must comply with the provisions of 40 CFR Part 403.

(c) This part does not apply to the porcelain enameling on precious metal basis material.

§ 466.02 General definitions.

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

(a) "Porcelain enameling" means the entire process of applying a fused vitreous enamel coating to a metal basis material. Usually this includes metal preparation and coating operations.

(b) "Basis material" means the metal part or base onto which porcelain enamel is applied.

(c) "Area processed" means the total basis material area exposed to processing solutions.

(d) "Area coated" means the area of basis material covered by each coating of enamel.

(e) "Coating operations" means all of the operations associated with preparation and application of the vitreous coating. Usually this includes ballmilling, slip transport, application of slip to the workpieces, cleaning and recovery of faulty parts, and firing (fusing) of the enamel coat.

(f) "Metal preparation" means any and all of the metal processing steps preparatory to applying the enamel slip. Usually this includes cleaning, pickling and applying a nickel flash or chemical coating.

(g) The term "Control Authority" is defined as the POTW if it has an approved pretreatment program; in the absence of such a program, the NPDES state if it has an approved pretreatment program or EPA if the State does not have an approved program.

(h) The term "precious metal" means gold, silver, or platinum group metals and the principal alloys of those metals.

§466.03 Monitoring and reporting requirements.

(a) Periodic analyses for chromium as may be required under Parts 122 or 403 of this chapter is not required when both of the following conditions are met.

(1) The first wastewater sample of each calendar year has been analyzed and found to contain less than 0.08 mg/l chromium.

(2) The owner or operator of the porcelain enameling facility certifies in writing to the control authority or permit issuing authority that chromium is not contained in the raw materials or process chemicals of that facility and will not be used in the facility.

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

§ 466.04 Compliance date for PSES.

The compliance date for pretreatment standards for existing sources is November 25, 1985.[2]

Subpart A—Steel Basis Material Subcategory

§ 466.10 Applicability; description of the steel basis material.

This subpart applies to discharges to waters of the United States, and introduction of pollutants into publicly owned treatment works from porcelain enameling on steel basis materials.

§ 466.11 Effluent limitations 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 for metal preparation operations and for coating operations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

SUBPART A.—BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
	Metric units—mg/m^2 of area processed or coated			
Chromium	16.82	3.41	6.81	1.38
Lead	6.01	1.21	5.21	1.06
Nickel	56.46	11.43	40.05	8.11
Zinc	53.26	10.78	22.43	4.54
Aluminum	182.20	36.87	74.47	15.07
Iron	49.26	9.97	25.23	5.11
Oil and grease	800.84	162.10	480.51	97.23
TSS	1642.00	332.20	800.90	162.00
pH	(1)	(1)	(1)	(1)

[2] The Consent Decreee in NRDC v. Train, 12 ERC (D.D.C. 1979) specifies a compliance date for PSES of no later than June 30, 1984. EPA will be moving for a modification of that provision of the Decree. Should the Court deny that motion, EPA will be required to modify this compliance date accordingly.

SUBPART A.—BPT EFFLUENT LIMITATIONS—Continued

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
English Units—pounds per 1 million ft² of area processed or coated				
Metric units—mg/m² of area processed or coated				
Chromium	3.45	0.07	1.40	0.29
Lead	1.23	0.25	1.07	0.22
Nickel	11.57	2.34	8.20	1.66
Zinc	10.91	2.21	4.60	0.93
Aluminum	37.32	7.55	15.26	3.09
Iron	10.09	2.04	5.17	1.05
Oil and grease	164.03	33.19	98.42	19.92
TSS	337.00	68.10	164.00	33.20
pH	(1)	(1)	(1)	(1)

(1) Within the range 7.5 to 10.0 at all times.

§ 466.12 Effluent limitations 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:

SUBPART A.—BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
Metric units—mg/m² of area processed or coated				
Chromium	16.82	0.27	6.81	0.11
Lead	6.01	0.10	5.21	0.09
Nickel	56.50	0.90	40.05	0.64
Zinc	53.30	0.85	22.43	0.36
Aluminum	182.00	2.90	74.48	1.19
Iron	49.30	0.79	25.23	0.41
English Units—pounds per 1 million ft² of area processed or coated				
Chromium	3.45	0.06	1.4	0.022
Lead	1.23	0.02	1.07	0.017
Nickel	11.57	0.19	8.20	0.13
Zinc	10.91	0.18	4.60	0.08
Aluminum	37.32	0.6	15.26	0.25
Iron	10.09	0.16	5.17	0.09

§ 466.13 New source performance standards.

Any new source subject to this subpart must achieve the following new source performance standards:

SUBPART A.—NSPS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
Metric units—mg/m² of area processed or coated				
Chromium	1.33	0.24	0.54	0.1
Lead	0.36	0.70	0.33	0.06
Nickel	1.97	0.35	1.32	0.24
Zinc	3.65	0.65	1.51	0.27
Aluminum	10.90	1.93	4.44	0.79
Iron	4.40	0.79	2.26	0.40
Oil and grease	35.75	6.36	35.75	6.36
TSS	53.7	9.54	39.4	7.0
pH	(1)	(1)	(1)	(1)
English units—pounds per 1 million ft² of area processed or coated				
Chromium	0.27	0.05	0.11	0.02
Lead	0.08	0.013	0.07	0.012
Nickel	0.41	0.08	0.27	0.05
Zinc	0.75	0.14	0.31	0.06
Aluminum	2.22	0.4	0.91	0.17
Iron	0.90	0.16	0.46	0.09
Oil and grease	7.33	1.31	7.33	1.31
TSS	10.99	1.96	8.06	1.44
pH	(1)	(1)	(1)	(1)

(1) Within the range 7.5 to 10.0 at all times.

§ 466.14 Pretreatment standards for existing sources.

(a) 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.

SUBPART A.—PSES

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
Milligrams per liter (mg/l)				
Chromium		0.42		0.17
Lead		0.15		0.13
Nickel		1.41		1.00
Zinc		1.33		0.56

(b) In cases where POTW find it necessary to impose mass effluent pretreatment standards the following equivalent mass standards are provided:

SUBPART A.—PSES

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
Metric units—mg/m² of area processed or coated				
Chromium	16.82	0.27	6.81	0.11
Lead	6.01	0.10	5.21	0.09
Nickel	56.5	0.90	40.1	0.64

SUBPART A.—PSES—Continued

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
Zinc	53.3	0.85	22.5	0.36
English units—pounds per 1 million ft² of area processed or coated				
Chromium	3.45	0.06	1.4	0.022
Lead	1.23	0.19	1.07	0.02
Nickel	11.6	0.19	8.20	0.13
Zinc	10.9	0.18	4.6	0.08

§ 466.15 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7 and 403.13, any new 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 new sources:

SUBPART A.—PSNS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
Metric units—mg/m² of area processed or coated				
Chromium	1.33	0.24	0.54	0.10
Lead	0.36	0.07	0.33	0.06
Nickel	1.97	0.35	1.33	0.24
Zinc	3.65	0.65	1.51	0.27
English units—pounds per 1 million ft² of area processed or coated				
Chromium	0.27	0.05	0.11	0.02
Lead	0.07	0.013	0.07	0.012
Nickel	0.41	0.08	0.27	0.05
Zinc	0.75	0.14	0.31	0.06

§ 466.16 [Reserved]

Subpart B—Cast Iron Basis Material Subcategory

§ 466.20 Applicability; description of the cast iron basis material subcategory.

This subpart applies to discharges to waters of the United States and introductions of pollutants into publicly owned treatment works from porcelain enameling of cast iron basis materials.

§ 466.21 Effluent limitations 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–.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.

(a) There shall be no discharge of process wastewater pollutants from metal preparation operations.

(b) The discharge of process wasterwater pollutants from all porcelain enameling coating operations shall not exceed the values set forth below:

SUBPART B.—BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Mg/m² (pounds per/1million ft²) of Area Coated			
Chromium	0.29	(0.06)	0.12	(0.024)
Lead	0.11	(0.02)	0.09	(0.02)
Nickle	0.98	(0.02)	0.7	(0.15)
Zinc	0.93	(0.19)	0.39	(0.08)
Aluminum	3.16	(0.65)	1.29	(0.27)
Iron	0.86	(0.18)	0.44	(0.09)
Oil and grease	13.86	(2.84)	8.32	(1.71)
TSS	28.42	(5.82)	13.86	(2.84)
pH	(1)	(1)	(1)	(1)

[1] Within the range 7.5 to 10.0 at all times.

§ 446.22 Effluent limitation 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.

(a) There shall be no discharge of process wastewater pollutants from metal preparation operations.

(b) The discharge of process wastewater pollutants from all porcelain enameling coating operations shall not exceed the values set forth below:

SUBPART B.—BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Mg/m² (pounds per/million ft²) of area coated			
Chromium	0.27	(0.06)	0.11	(0.022)
Lead	0.10	(0.02)	0.09	(0.017)
Nickle	0.90	(0.19)	0.64	(0.13)
Zinc	0.85	(0.18)	0.36	(0.08)
Aluminum	2.90	(0.60)	1.19	(0.25)
Iron	0.79	(0.16)	0.40	(0.09)

§ 466.23 New source performance standards.

Any new source subject to this subpart must achieve the following new source performance standards.

(a) There shall be no discharge of process wastewater pollutants from metal preparation operations.

(b) The discharge of process wastewater pollutants from all porcelain enameling coating operations shall not exceed the values set forth below:

SUBPART B.—NSPS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Mg/m² (pounds per million ft²) of area coated			
Chromium	0.24	(0.05)	0.10	(0.02)
Lead	0.07	(0.013)	0.06	(0.012)
Nickel	0.35	(0.08)	0.24	(0.05)
Zinc	0.65	(0.14)	0.27	(0.06)
Aluminum	1.93	(0.4)	0.79	(0.17)
Iron	0.79	(0.16)	0.40	(0.09)
Oil and grease	6.36	(1.31)	6.36	(1.31)
TSS	9.54	(1.95)	7.00	(1.44)
pH	(1)	(1)	(1)	(1)

[1] Within the range 7.5 to 10.0 at all times.

§ 466.24 Pretreatment standards for existing sources.

(a) 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.

(1) There shall be no discharge of process wastewater pollutants from metal preparation operations.

(2) The discharge of process wastewater pollutants from all porcelain enameling coating operations shall not exceed the values set forth below:

SUBPART B.—PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Chromium	0.42	0.17
Lead	0.15	0.13
Nickel	1.41	1.00
Zinc	1.33	0.56

(b) In cases when POTW find it necessary to impose mass pretreatment standards the following equivalent mass standards are provided.

(1) There shall be no discharge of process wastewater pollutants from metal preparation operations.

(2) The discharge of process watewater pollutants from all porcelain enameling costing operations shall not exceed the values set forth below:

SUBPART B.—PSES

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metric units—mg/m² (English Units—pounds per million ft²) of area coated			
Chromium	0.27	(0.06)	0.11	(0.022)
Lead	0.10	(0.02)	0.09	(0.017)
Nickel	0.90	(0.19)	0.64	(0.13)
Zinc	0.85	(0.18)	0.36	(0.08)

§ 466.25 Pretreatment standards for new sources.

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

(a) There shall be no discharge of process wastewater pollutants from metal preparation operations.

(b) The discharge of process wastewater pollutants from all procelain enameling coating operations shall not exceed the values set forth below:

SUBPART B.—PSNS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Mg/m² (pounds per million ft²) of area coated			
Chromium	0.24	(0.05)	0.10	(0.02)
Lead	0.07	(0.02)	0.06	(0.012)
Nickel	0.35	(0.08)	0.24	(0.05)
Zinc	0.65	(0.14)	0.27	(0.06)

§ 466.26 [Reserved]

Subpart C—Aluminum Basis Material Subcategory

§ 466.30 Applicability; description of the aluminum basis material subcategory.

This subpart applies to discharges to waters of the United States and introductions of pollutants into publicly owned treatment works from porcelain enameling of aluminum basis materals.

§ 466.31 Effluent limitations 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 available technology economically achievable:

SUBPART C.—BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
	Metric units—mg/m² of area processed or coated			
Chromium	16.34	6.32	6.63	2.56
Lead	5.84	2.26	5.06	1.96
Nickel	54.85	21.21	38.90	15.04
Zinc	51.73	20.01	21.79	8.43
Aluminum	176.98	68.44	72.35	27.98
Iron	47.85	18.50	24.51	9.48
Oil and grease	777.92	300.84	466.76	108.50
TSS	1,594.74	616.68	777.92	300.82
pH	(1)	(1)	(1)	(1)
	English units—pounds per 1 million ft² of area processed or coated			
Chromium	3.35	1.30	1.37	0.53
Lead	1.20	0.47	1.04	0.40
Nickel	11.24	4.35	7.97	3.08
Zinc	10.6	4.10	4.46	1.73
Aluminum	36.25	14.02	14.82	5.73
Iron	9.80	3.79	5.02	1.94
Oil and grease	159.33	61.61	95.60	36.97
TSS	326.62	126.33	159.33	61.61
pH	(1)	(1)	(1)	(1)

(1) Within the range 7.5 to 10.0 at all times.

§ 466.32 Effluent limitations 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.

SUBPART C.—BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
	Metric units—mg/m² of area processed or coated			
Chromium	16.34	0.27	6.62	0.11
Lead	5.84	0.10	5.06	0.09
Nickel	54.85	0.90	38.90	0.64
Zinc	51.74	0.85	21.79	0.36
Aluminum	176.98	2.9	72.35	1.19
Iron	47.85	0.79	24.51	0.40
	English units—pounds per 1 million ft² of area processed or coated			
Chromium	3.35	0.06	1.36	0.022
Lead	1.20	0.02	1.04	0.02
Nickel	11.24	0.19	7.97	0.13
Zinc	10.60	0.18	4.46	0.08
Aluminum	36.25	0.60	14.82	0.25
Iron	9.80	0.16	5.02	0.09

§ 466.33 New source performance standards.

Any new source subject to this subpart must achieve the following new source performance standards:

SUBPART C.—NSPS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
	Metric units—mg/m² of area processed or coated			
Chromium	1.29	0.24	0.52	0.1
Lead	0.35	0.07	0.32	0.05
Nickel	1.91	0.35	1.29	0.24
Zinc	3.55	0.65	1.46	0.27
Aluminum	10.53	1.93	4.31	0.79
Iron	4.28	0.79	2.19	0.40
Oil and grease	34.73	6.36	34.73	6.36
TSS	52.1	9.54	38.21	7.00
pH	(1)	(1)	(1)	(1)
	English units—pounds per 1 million ft² of area processed or coated			
Chromium	0.27	0.05	0.11	0.02
Lead	0.07	0.013	0.07	0.012
Nickel	0.39	0.09	0.27	0.05
Zinc	0.73	0.14	0.3	0.06
Aluminum	2.16	0.4	0.89	0.17
Iron	0.88	0.16	0.45	0.09
Oil and grease	7.12	1.31	7.12	1.31
TSS	10.67	1.96	7.83	1.44
pH	(1)	(1)	(1)	(1)

(1) Within the range 7.5 to 10.0 at all times.

§ 466.34 Pretreatment standards for existing sources.

(a) 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.

SUBPART C.—PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Chromium	0.42	0.17
Lead	0.15	0.13
Nickel	1.41	1.00
Zinc	1.33	0.56

(b) In cases when POTW find it necessary to impose mass pretreatment standards the following equivalent mass standards are provided:

SUPART C.—PSES

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
	Metric units—mg/m² of area processed or coated			
Chromium	16.34	0.28	6.62	0.11
Lead	5.84	0.10	5.06	0.09
Nickel	54.85	0.90	38.9	0.64
Zinc	51.74	0.85	21.79	0.36
	English units—pounds per 1 million ft² of area processed or coated			
Chromium	3.35	0.06	1.36	0.022
Lead	1.20	0.02	1.04	0.017
Nickel	11.24	1.19	7.97	0.13
Zinc	10.6	0.18	4.46	0.08

§ 466.35 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new 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 new sources.

SUBPART C.—PSNS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
	Metric units—mg/m² of area processed or coated			
Chromium	1.29	0.24	0.52	0.1
Lead	0.35	0.07	0.32	0.06
Nickel	1.91	0.35	1.29	0.24
Zinc	3.55	0.65	1.46	0.27
	English units—pounds per 1 million ft² of area processed or coated			
Chromium	0.27	0.05	0.11	0.02
Lead	0.07	0.013	0.07	0.02
Nickel	0.39	0.08	0.27	0.05
Zinc	0.73	0.14	0.3	0.06

§ 466.36 [Reserved]

Subpart D—Copper Basis Material Subcategory

§ 466.40 Applicability; description of the copper basis material subcategory.

This subpart applies to discharges to waters of the United States and introductions of pollutants into publicly owned treatment works from porcelain enameling of copper basis materials.

§ 466.41—466.42 [Reserved]

§ 466.43 New source performance standards.

Any new source subject to this subpart must achieve the following new source performance standards:

SUBPART D.—NSPS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
	Metric units—mg/m² of area processed or coated			
Chromium	2.23	0.24	0.90	0.1
Lead	0.60	0.07	0.54	0.06
Nickel	3.31	0.35	2.23	0.24
Zinc	6.13	0.65	2.53	0.27
Aluminum	18.21	1.93	7.46	0.79
Iron	7.4	0.79	3.79	0.40
Oil and grease	60.1	6.36	60.1	6.36
TSS	90.15	9.54	66.11	7.0
pH	(1)	(1)	(1)	(1)
	English units—pounds per 1 million ft² of area processed or coated			
Chromium	0.46	0.05	0.19	0.02

SUBPART D.—NSPS—Continued

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
Lead	0.13	0.013	0.11	0.012
Nickel	0.68	0.08	0.46	0.05
Zinc	1.26	0.14	0.52	0.06
Aluminum	3.73	0.4	1.53	0.17
Iron	1.52	0.16	0.78	0.09
Oil and grease	12.31	1.31	12.31	1.31
TSS	18.47	1.96	13.54	1.44
pH	(1)	(1)	(1)	(1)

[1] Within the range 7.5 to 10.0 at all times.

§ 466.44 [Reserved]

§ 466.45 Pretreatment standards for new sources.

Any new 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 new sources:

SUBPART D.—PSNS

Pollutant or pollutant property	Maximum for any 1 day		Maximum for monthly average	
	Metal preparation	Coating operation	Metal preparation	Coating operation
	Metric units—mg/m² of area processed or coated			
Chromium	2.23	0.24	0.90	0.1
Lead	0.6	0.07	0.54	0.06
Nickel	3.31	0.35	2.53	0.28
Zinc	6.13	0.65	2.53	0.28
	English units—pounds per 1 million ft² of area processed or coated			
Chromium	0.46	0.05	0.19	0.02
Lead	0.13	0.013	0.11	0.012
Nickel	0.68	0.08	0.46	0.05
Zinc	1.26	0.14	0.52	0.06

§ 466.46 [Reserved]

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