ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 413, 433, 438, 463, 464, 467, and 471

[FRL–6897–6]

RIN 2040–AB79

Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards for the Metal Products and Machinery Point Source Category; Proposed Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: This proposal represents the Agency's second look at Clean Water Act national effluent limitations guidelines and pretreatment standards for wastewater discharges from metal products and machinery facilities. EPA initially proposed effluent limitations guidelines and pretreatment standards for a portion of this category on May 30, 1995 (60 FR 28210). This proposal completely replaces the 1995 proposal. Today's proposed regulation would establish technology-based effluent limitations guidelines and pretreatment standards for wastewater discharges associated with the operation of new and existing metal products and machinery facilities. The metal products and machinery industry includes facilities that manufacture, rebuild, or maintain metal products, parts, or machines.

EPA estimates that compliance with this regulation will reduce the discharge of conventional pollutants by at least 115 million pounds per year, priority pollutants by 12 million pounds per year, and nonconventional metal and organic pollutants by 43 million pounds per year for an estimated compliance cost of $1.98 billion (pre-tax, 1999$) annually. EPA estimates that the annual benefits of the proposal range from $0.4 billion to $1.1 billion. In addition, this proposal solicits comment on new methodologies for expanding the analysis to include additional categories of recreational benefits.

DATES: EPA must receive comments on the proposal by May 3, 2001. EPA is conducting a public meeting (9:00 AM—12:00 PM) and hearing on the pretreatment standards (1:00 PM—4:00 PM) for this proposed rule on each of the following dates: February 6, 2001 in Oakland, CA; February 13, 2001 in Dallas, TX; and February 22, 2001 in Washington, DC.

ADDRESSES: Submit written comments to, Mr. Michael Ebner, Office of Water, Engineering and Analysis Division (4303), U.S. EPA, 1200 Pennsylvania Ave., NW, Washington, DC 20460 if by mail and to Mr. Michael Ebner, U.S. EPA, 401 M St., SW, Room 611 West Tower, Washington, DC 20460 if by hand delivery. Comments may also be sent via E-mail to ''mpm.comments@epa.gov''. Please submit any references cited in your comments. EPA requests an original and three copies of your comments and enclosures (including references). Commenters who want EPA to acknowledge receipt of their comments should enclose a self-addressed, stamped envelope. No facsimiles (faxes) will be accepted. For additional information on how to submit electronic comments see ''**SUPPLEMENTARY INFORMATION,** How to Submit Comments.''

EPA will be holding public meetings and pretreatment hearings on today's proposal on three separate dates. The meeting in Oakland, CA will be held at the Oakland Mariott, City Center, 1001 Broadway, Oakland, CA 96607. The meeting in Dallas, TX will be held in the Oklahoma and Texas rooms at the EPA Region 6 Offices, 1455 Ross Avenue, Dallas, TX. The meeting in Washington, DC will be held in EPA's Auditorium, Waterside Mall, 401 M St. SW, Washington, DC.

EPA established the public record for this proposed rulemaking under docket number W–99–23. It is located in the Water Docket, East Tower Basement, 401 M St. SW, Washington, DC 20460. The record is available for inspection from 9 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. For access to the docket materials, call (202) 260–3027 to schedule an appointment. You may have to pay a reasonable fee for copying.

FOR FURTHER INFORMATION CONTACT: For technical information concerning today's proposed rule, contact Mr. Michael Ebner at (202) 260–5397 or Ms. Shari Barash at (202) 260–7130. For economic information contact Dr. Lynne Tudor at (202) 260–5834.

SUPPLEMENTARY INFORMATION:

Regulated Entities

Entities potentially regulated by this action include:

Category	Examples of regulated entities
Industry	• Facilities that manufacture, maintain, or rebuild metal parts, products or machines used in the following sectors: Aerospace, Aircraft, Bus & Truck, Electronic Equipment, Hardware, Household Equipment, Instruments, Job Shops, Mobile Industrial Equipment, Motor Vehicles, Office Machines, Ordnance, Precious Metals and Jewelry, Printed Wiring Boards, Railroad, Ships and Boats, Stationary Industrial Equipment, and Miscellaneous Metal Products.
Government	• State and local government facilities that manufacture, maintain, or rebuild metal parts, products or machines (*e.g.,* a town that operates its own bus, truck, and/or snow removal equipment maintenance facility). • Federal facilities that manufacture, maintain, or rebuild metal parts, products or machines (*e.g.,* U.S. Naval Shipyards).

EPA does not intend the preceding table to be exhaustive, but rather it provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the applicability criteria proposed in Sections III and VI.C and detailed further in section 438.1 of the proposed rule. If you have questions regarding the applicability of this action to a particular entity, consult one of the persons listed for technical information in the preceding **FOR FURTHER INFORMATION CONTACT** section.

How To Submit Comments

Electronic comments must be identified by the docket number W–99–23 and must be submitted as an ASCII, or WordPerfect 5/6/7/8/9 or Microsoft Word 97 file avoiding the use of special characters and any form of encryption. EPA also will accept comments and data on disks in Word Perfect 5/6/7/8/9, Microsoft Word 97 or ASCII file format. Electronic comments on this notice may be filed online at some Federal Depository Libraries. No confidential business information (CBI) should be sent via e-mail. In the public record for

the final MP&M regulation, EPA will respond to comments from the 1995 Phase I proposal as well as today's proposal. Therefore, comments submitted on the Phase I rule do not need to resubmitted in response to this proposal.

Public Meeting and Pretreatment Hearing Information:

In each location, the public meeting will be held in the morning and the pretreatment hearing will be held in the afternoon (see **DATES** and **ADDRESSES** for dates and locations of public meetings and pretreatment hearings). During the public meeting, EPA will present information on the applicability of the proposed regulation, the technology options selected as the basis for the proposed limitations and standards, and the compliance costs and pollutant reductions. EPA will also allow time for questions and answers during this session. During the pretreatment hearing, the public will have the opportunity to provide oral comment to EPA. EPA will not address any issues raised during the pretreatment hearing at that time, but these comments will be recorded and included in the public record for the rule. Persons wishing to present formal comments at the public hearing should contact Mr. Michael Ebner before the hearing and should have a written copy of their comments for submittal.

Protection of Confidential Business Information

EPA notes that many documents in the record supporting the proposed rule have been claimed as CBI and, therefore, EPA has not included these documents in the public record. To support the rulemaking, EPA is presenting certain information in aggregated form or, alternatively, is masking facility identities in order to preserve confidentiality claims. Further, the Agency has withheld from disclosure some data not claimed as CBI because release of this information could indirectly reveal information claimed to be confidential.

Facility-specific data, claimed as CBI, are available to the company that submitted the information. To ensure that EPA protects all CBI in accordance with EPA regulations, any requests for company-specific data should be submitted to EPA on company letterhead and signed by the official authorized to receive such data. The request must list the specific data requested and include the following statement, ''I certify that EPA is authorized to transfer confidential business information submitted by my company, and that I am authorized to receive it.''

Supporting Documentation

Several key documents support the proposed regulations:

1. ''Development Document for the Proposed Effluent Limitations Guidelines and Standards for the Metal Products & Machinery Point Source Category'' [EPA–821–B–00–005]: This document presents EPA's methodology and technical conclusions concerning the Metal Products & Machinery Point Source Category.

2. ''Economic, Environmental, and Benefits Analysis of the Proposed Metal Products & Machinery Rule'' [EPA–821–B–00–008]: This document presents the methodology employed to assess economic and environmental impacts of the proposed rule and the results of the analysis.

3. Cost-Effectiveness Analysis of the Proposed Effluent Limitations Guidelines and Standards for the Metal Products & Machinery Point Source Category'' [EPA–821–B–00–007] This document analyzes the cost-effectiveness of the proposed regulation.

4. ''Statistical Support Document for the Proposed Effluent Limitations Guidelines and Standards for the Metal Products & Machinery Industry'' [EPA–821–B–00–006]: This document establishes the statistical methodology for developing numerical discharge limitations.

Major supporting documents are available in hard copy from the National Service Center for Environmental Publications (NSCEP), U.S. EPA/NSCEP, P.O. Box 42419, Cincinnati, Ohio, USA 45242–2419, (800) 490–9198, *http://www.epa.gov/ncepihom/.* You can obtain electronic copies of this preamble and rule as well as the technical and economic support documents for today's proposal at *http://www.epa.gov/ost/guide/mpm.*

Overview

The preamble describes the terms, acronyms, and abbreviations used in this notice; the background documents that support these proposed regulations; the legal authority of these rules; a summary of the proposal; background information; and the technical and economic methodologies used by the Agency to develop these regulations. This preamble also solicits comment and data on specific areas of interest.

In addition, this preamble proposes to update references in the relevant parts of the Code of Federal Regulations (CFR) to include the Metal Products & Machinery Point Source Category. References in 40 CFR would be updated in the Electroplating (part 413), Metal Finishing (part 433), Plastic Molding and Forming (part 463), Metal Molding and Casting (part 464), Aluminum Forming (467), and Nonferrous Metals Forming and Metal Powders (part 471) effluent guidelines point source categories.

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I. Legal Authority

EPA is proposing this regulation under the authorities of sections 301, 304, 306, 307, 308, 402 and 501 of the Clean Water Act, 33 U.S.C. Sections 1311, 1314, 1316, 1317, 1318, 1342 and 1361 and under authority of the Pollution Prevention Act of 1990 (PPA), 42 U.S.C. 13101 *et seq.*, Pub L. 101–508, November 5, 1990.

II. Background

A. Statutory Authorities

1. Clean Water Act

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

Congress recognized that regulating only those sources that discharge effluent directly into the nation's waters would not be sufficient to achieve the CWA's goals. Consequently, the CWA requires EPA to promulgate nationally applicable pretreatment standards which restrict pollutant discharges for those who discharge wastewater indirectly through sewers flowing to publicly-owned treatment works (POTWs) (Sections 307(b) and (c), 33 U.S.C. 1317(b) and (c)). EPA establishes national pretreatment standards for those pollutants in wastewater from indirect dischargers which may pass through or interfere with POTW operations. Generally, the Agency develops pretreatment standards to ensure that wastewater from direct and indirect industrial dischargers are subject to similar levels of treatment. In addition, EPA requires POTWs to implement local treatment limits applicable to their industrial indirect dischargers to satisfy any local requirements (40 CFR 403.5).

Direct dischargers must comply with effluent limitations in National Pollutant Discharge Elimination System (''NPDES'') permits; indirect dischargers must comply with pretreatment standards. EPA establishes these limitations and standards by regulation for categories of industrial dischargers and bases them on the degree of control that can be achieved using various levels of pollution control technology.

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

In the guidelines for an industry category, EPA defines BPT effluent limits for conventional, toxic,[1] and non-

[1] In the initial stages of EPA CWA regulation, EPA efforts emphasized the achievement of BPT limitations for control of the ''classical'' pollutants

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

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

In general, BAT effluent limitations guidelines represent the best existing economically achievable performance of direct discharging plants in the industrial subcategory or category. The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the processes employed, engineering aspects of the control technology, potential process changes, non-water quality environmental impacts (including energy requirements), and such factors as the Administrator deems appropriate. The Agency retains considerable discretion in assigning the weight to be accorded to these factors. An additional statutory factor considered in setting BAT is economic achievability. Generally, EPA determines the economic achievability on the basis of the total cost to the industrial subcategory and the overall effect of the rule on the industry's financial health. The Agency may base BAT limitations upon effluent reductions attainable through changes in a facility's processes and operations. As with BPT, where existing performance is uniformly inadequate, EPA may base BAT upon technology transferred from a different subcategory within an industry or from another industrial category. In addition, the Agency may base BAT upon process changes or internal controls, even when these technologies are not common industry practice.

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

The 1977 amendments to the CWA required EPA to identify effluent reduction levels for conventional pollutants associated with BCT technology for discharges from existing industrial point sources. BCT is not an additional limitation, but replaces Best Available Technology (BAT) for control of conventional pollutants. In addition to other factors specified in Section 304(b)(4)(B), the CWA requires that EPA establish BCT limitations after consideration of a two-part ''cost-reasonableness'' test. EPA explained its methodology for the development of BCT limitations in July 1986 (51 FR 24974).

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

d. New Source Performance Standards (NSPS)—Sec. 306 of the CWA

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

e. Pretreatment Standards for Existing Sources (PSES)—Sec. 307(b) of the CWA

PSES are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of publicly owned treatment works (POTWs). The CWA authorizes EPA to establish pretreatment standards for pollutants that pass through POTWs or interfere with treatment processes or sludge disposal methods at POTWs. Pretreatment standards are technology-based and analogous to BAT effluent limitations guidelines.

The General Pretreatment Regulations, which set forth the framework for implementing categorical pretreatment standards, are found at 40 CFR part 403. Those regulations contain a definition of pass through that addresses localized rather than national instances of pass through and establish pretreatment standards that apply to all non-domestic dischargers. See 52 FR 1586, January 14, 1987.

f. Pretreatment Standards for New Sources (PSNS)—Sec. 307(b) of the CWA

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

2. Pollution Prevention Act

The Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101 *et seq.*, Pub. L. 101–508, November 5, 1990) makes pollution prevention the national policy of the United States. The PPA identifies an environmental management hierarchy in which pollution ''should be prevented or reduced whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or release into the environment should be employed only as a last resort* * *'' (42 U.S.C. 13103). In short, preventing pollution before it is created is preferable to trying to manage, treat or dispose of it after it is created. According to the PPA, source reduction reduces the generation and release of hazardous substances, pollutants, wastes, contaminants or residuals at the source, usually within a process. The term source reduction ''* * * includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory

(*e.g.,* TSS, pH, BOD_5). However, nothing on the face of the statute explicitly restricted BPT limitation to such pollutants. Following passage of the Clean Water Act of 1977 with its requirement for point sources to achieve best available technology limitations to control discharges of toxic pollutants, EPA shifted its focus to address the listed priority toxic pollutants under the guidelines program. BPT guidelines continue to include limitations to address all pollutants.

control. The term 'source reduction' does not include any practice which alters the physical, chemical, or biological characteristics or the volume of a hazardous substance, pollutant, or contaminant through a process or activity which itself is not integral to or necessary for the production of a product or the providing of a service.'' In effect, source reduction means reducing the amount of a pollutant that enters a waste stream or that is otherwise released into the environment prior to out-of-process recycling, treatment, or disposal.

B. Existing Regulation for Metals Industries

EPA has established effluent guidelines regulations for thirteen industrial categories which may perform operations that are sometimes found in MP&M facilities. These effluent guidelines are:

- Electroplating (40 CFR part 413);
- Iron and Steel Manufacturing (40 CFR part 420);
- Nonferrous Metals Manufacturing (40 CFR part 421);
- Ferroalloy Manufacturing (40 CFR part 424);
- Metal Finishing (40 CFR part 433);
- Battery Manufacturing (40 CFR part 461);
- Metal Molding & Casting (40 CFR part 464);
- Coil Coating (40 CFR part 465);
- Porcelain Enameling (40 CFR part 466);
- Aluminum Forming (40 CFR part 467);
- Copper Forming (40 CFR part 468);
- Electrical and Electronic Components (40 CFR part 469); and
- Nonferrous Metals Forming and Metal Powders (40 CFR part 471).

In 1986, the Agency reviewed coverage of these regulations and identified a significant number of metals processing facilities discharging wastewater that these 13 regulations did not cover. Based on this review, EPA performed a more detailed analysis of these facilities that were not subject to national effluent guidelines and pretreatment standards. This analysis identified the discharge of significant amounts of pollutants. This analysis resulted in the decision to develop national limitations and standards for the ''Machinery Manufacturing and Rebuilding'' (MM&R) point source category. In 1992, EPA changed the name of the category to ''Metal Products and Machinery'' (MP&M) to clarify coverage of the category (57 FR 19748).

EPA recognizes that in some cases unit operations performed in industries covered by the existing effluent guidelines are the same as unit operations performed at MP&M facilities. In general, when unit operations and their associated wastewater discharges are already covered by an existing effluent guideline, they will remain covered under that effluent guideline. (See § 438.1(b)). However, for the existing Electroplating (40 CFR 413) and Metal Finishing (40 CFR 433) effluent guidelines some facilities will be covered by this proposal. EPA is proposing to replace the existing Electroplating (40 CFR 413) and Metal Finishing (40 CFR 433) effluent guidelines with the MP&M regulations for all facilities in the Printed Wiring Board subcategory (see proposed rule § 438.40) and the Metal Finishing Job Shops subcategory (see proposed rule § 438.20). (See Table II.B–1 for clarification for details and Section VI.C for a discussion of subcategory-specific applicability).

When a facility covered by an existing metals effluent guidelines (other than Electroplating or Metal Finishing) discharges wastewater from unit operations not covered under that existing metals guideline but covered under MP&M, the facility will need to comply with both regulations. (See § 438.1(c)). In those cases, the permit writer or control authority (*e.g.,* Publicly Owned Treatment Works) will combine the limitations using an approach that proportions the limitations based on the different in-scope production levels (for production-based standards) or wastewater flows. POTWs refer to this approach as the ''combined wastestream formula'' (40 CFR 403.6(e)), while NPDES permit writers refer to it as the ''building block approach.'' Permit writers and local control authorities currently issue permits and control mechanisms for many facilities in other effluent guidelines categories where overlaps with more than one effluent limitation guidelines regulation occur (*e.g.,* Organic Chemicals, Plastics, and Synthetic Fibers; Pesticide Manufacturing; Pesticide Formulating, Packaging and Repackaging; and Pharmaceutical Manufacturing). See Sections III and VI.C of this preamble for additional discussion of applicability.

TABLE II.B–1.—CLARIFICATION OF COVERAGE BY MP&M SUBCATEGORY

Subcategory	Proposing to continue to cover under 40 CFR Part 413 (Electroplating)	Proposing to continue to cover under 40 CFR Part 433 (Metal Finishing)	Proposing to cover under 40 CFR Part 438 (Metal Products & Machinery)
General Metals	Existing facilities that are currently covered by 413 AND are indirect dischargers that introduce less than or equal to 1 million gallons per year into a POTW.	Existing facilities that are currently covered (or new facilities that would be covered) by 433 AND are indirect dischargers that introduce less than or equal to 1 million gallons per year into a POTW.	All new and existing direct dischargers in this subcategory regardless of annual wastewater discharge volume and all new and existing indirect dischargers in this subcategory with annual wastewater discharges greater than 1 million gallons per year.(See § 438.10).
Metal Finishing Job Shops	none (see non-chromium anodizing).	none (see non-chromium anodizing).	All new and existing direct and indirect discharges under this subcategory. These facilities would no longer be covered by 413 or 433. (See § 438.20).

TABLE II.B–1.—CLARIFICATION OF COVERAGE BY MP&M SUBCATEGORY—Continued

Subcategory	Proposing to continue to cover under 40 CFR Part 413 (Electroplating)	Proposing to continue to cover under 40 CFR Part 433 (Metal Finishing)	Proposing to cover under 40 CFR Part 438 (Metal Products & Machinery)
Non-Chromium Anodizers ..... Note: Facilities that perform anodizing with chromium or with the use of dichromate sealants (or commingle their non-chromium anodizing process wastewater with wastewaster from other MP&M subcategories) will be covered by 40 CFR 438.	Existing indirect dischargers that are currently covered by 413 AND that only perform non-chromium anodizing (or do not commingle their non-chromium anodizing wastewater with other process wastewater for discharge).	New and existing indirect dischargers (not covered by 413) that only perform non-chromium anodizing (or do not commingle their non-chromium anodizing wastewater with other process wastewater for discharge).	Existing and new direct dischargers that only perform non-chromium anodizing (or do not commingle their non-chromium anodizing wastewater with other process wastewater for discharge). (See § 438.30).
Printed Wiring Board (Printed Circuit Board).	None	None	All new and existing direct and indirect dischargers under this subcategory. These facilities would no longer be covered by 413 or 433. (See § 438.40).
Steel Forming & Finishing	N/A	N/A	All new and existing direct and indirect discharges under this subcategory as described. (See § 438.50).
Oily Waste	N/A	N/A	All new and existing direct and indirect dischargers under this subcategory as described. (See § 438.60) (This subcategory excludes new and existing indirect dischargers that introduce less than or equal to 2 MGY into a POTW. Facilities under the cut-off are not and will not be covered by national categorical regulations).
Railroad Line Maintenance	N/A	N/A	All new and existing direct dischargers under this subcategory as described. (See § 438.70) There are no national categorical pretreatment standards for these facilities.
Shipbuilding Dry Docks	N/A	N/A	All new and existing direct dischargers under this subcategory as described. (See § 438.80) There are no national categorical pretreatment standards for these facilities.

EPA does not intend the preceding table to be exhaustive, but rather it provides a guide for readers regarding the clarification of the proposed applicability to the Electroplating, Metal Finishing, and Metal Products & Machinery effluent guidelines. In order to determine whether EPA is proposing to regulate a particular facility by this action, please carefully examine the applicability criteria detailed in the codified text of this proposed rule accompanying today's preamble.

C. 1995 Proposal for Phase I Sectors

On May 30, 1995, EPA published a proposal entitled, ''Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards: Metal Products and Machinery'' (60 FR 28210). Throughout this preamble, EPA refers to this 1995 proposal as the ''Phase I'' or the ''1995'' proposal for the Metal Products and Machinery industry. EPA initially divided the industry into two phases based on industrial sector as the Agency believed that would make the regulation more manageable. The Phase I proposal included the following industry sectors: Aerospace; Aircraft; Electronic Equipment; Hardware; Mobile Industrial Equipment; Ordnance; and Stationary Industrial Equipment. At that time, EPA planned to propose a rule for the Phase II sectors approximately three years after the MP&M Phase I proposal.

EPA received over 4,000 pages of public comment on the Phase I proposal. One area where commenters from all stakeholder groups (*i.e,* industry, environmental groups, regulators) were in agreement was that EPA should not divide the industry into two separate regulations. Commenters raised concerns regarding the regulation of similar facilities with different compliance schedules and potentially different limitations solely based on whether they were in a Phase I or Phase II MP&M industrial sector. Furthermore, many facilities performed work in multiple sectors. In such cases, permit writers and control authorities (e.g., POTWs) would need to decide which MP&M rule (Phase I or II) applied to a facility.

Based on these comments, EPA decided to combine the two phases of the regulation into one proposal—today's proposal. Today's proposal will completely replace the 1995 proposal. Under the 304(m) decree as amended, these MP&M rules are to be promulgated in December 2002. EPA developed today's proposal using data from both the Phase I and II data collection efforts. (See Section V for discussion on MP&M data collection efforts). In the public

record for the final MP&M regulation, EPA will respond to comments from the 1995 Phase I proposal as well as today's proposal. Therefore, comments submitted on the Phase I rule do not need to be resubmitted in response to this proposal. In addition, compliance deadlines proposed in the 1995 Phase I proposal would obviously no longer apply.

D. Summary of Most Significant Changes from 1995 Proposal

In addition to the merging of the Phase I and Phase II industry sectors under one proposed rule, as discussed in Section II.C. above, there were several areas of comments from the 1995 proposal that EPA attempted to address in today's proposed rule.

Use of Aluminum and Iron as Indicator Parameters

In the 1995 proposal, EPA proposed pretreatment standards for existing sources (PSES) for seven metals and cyanide as well as oil & grease. Aluminum and iron were two of the seven metals with numerical pretreatment standards. As discussed in the Phase I preamble (60 FR 28228), EPA intended to regulate aluminum and iron as indicator metals for removal of non-regulated metals that may be processed at MP&M sites. Due to the fact that the optimal pH levels for the removal of aluminum (pH = 7.5–8) and iron (pH = 10.5) represent the end points of the pH range for the removal of most metals that EPA expected to be in MP&M wastewater, the Agency concluded that the removal of aluminum and iron would indicate effective removal of other metal types. EPA received many comments from various stakeholder groups, including Publicly Owned Treatment Works (POTWs) on this issue. The comments from POTWs indicated that in addition to MP&M sites using aluminum and iron as treatment chemicals, POTWs also use coagulants and flocculation aids containing these metals for treatment. Many POTWs considered it desirable to receive discharges containing aluminum and iron as it may reduce their treatment chemical costs. Therefore, EPA has decided not to propose pretreatment standards for aluminum and iron from indirect discharging MP&M facilities in today's combined MP&M proposal. However, EPA is proposing aluminum limitations for facilities in one subcategory (*i.e.,* Non-Chromium Anodizing) that discharge directly into the nation's surface waters (see Section VI for a discussion on subcategorization).

Use of Oil and Grease as an Indicator Parameter

EPA also received many comments on the Phase I proposal regarding regulation of another pollutant, oil & grease (O&G), as an indicator parameter. In an effort to reduce the burden of analytical monitoring for organic pollutants on the Phase I MP&M facilities, EPA chose to propose the use of O&G as an indicator parameter for organic pollutants. EPA proposed a limit (daily maximum of 35 mg/L and a monthly average of 17 mg/L) that demonstrated good removals of organic pollutants in MP&M wastewater. As discussed in the preamble of the 1995 proposal (60 FR 28231), EPA identified several organic pollutants (2-methylnapthalene, 2-propanone, n-octadecane, and n-tetradecane) that would ''pass through'' a POTW (see Section XII for a discussion of POTW pass through). EPA stated that ''these organic pollutants are more likely to partition to the oily phase than the water phase, thus EPA believed that the treatment and removal of oil and grease in wastewater will also result in significant removals of these pollutants.'' Many commenters stated that the pretreatment standard proposed for O&G was too stringent. They commented that EPA typically does not establish pretreatment standards for conventional pollutants such as O&G and that local POTWs are in the best position to establish standards for O&G, where necessary, taking into account POTW design and current O&G loading and that the typical local limits for O&G are between 100–200 mg/L.

Based on these comments, EPA expanded its wastewater sampling and analysis program to include a variety of potential organic pollutant indicators. EPA investigated the correlation of organic pollutant concentrations and removals at MP&M sites with the following parameters: Oil & Grease (as Hexane Extractable Material (HEM)), Total Organic Carbon (TOC), Chemical Oxygen Demand (COD), 5-Day Biochemical Oxygen Demand (BOD_5), Total Petroleum Hydrocarbon (as Silica Gel Treated-Hexane Extractable Material (SGT-HEM)), and Total Recoverable Phenolics. EPA determined TOC to be the best correlation for removal of organic pollutants from MP&M wastewater.

To determine which parameter best indicated the amount of organic pollutants in an MP&M wastestream, EPA researched the analytical methods for each parameter to determine what organic constituents the method measures, how the method measures them, and the limitations of the method. Because sampling at MP&M facilities generally lasted five days, EPA did not have enough data available to statistically establish a correlation on a site level. Therefore, EPA grouped all of the data from EPA sampling at MP&M facilities into the following organic-pollutant-bearing wastestream categories that fed sampled treatment systems: machining and grinding, washing and maintenance, wastewater expected to have low concentrations of organic compounds, and oily wastewater from shipbuilding dry docks. The Agency chose to group the wastestreams in this manner in order to determine if a particular organic indicator parameter was more appropriate for different types of wastewater. That is, machining and grinding wastewater tended to have more concentrated organic constituents while wastewater from washing and maintenance was more dilute. EPA also identified other unit operations (apart from washing and maintenance) that resulted in wastewater with low concentrations of organic constituents. And, EPA chose to analyze wastewater from shipbuilding dry docks separately because of the type of treatment in place. Shipbuilding dry docks tend to treat their wastewater with dissolved air flotation (DAF); therefore, the Agency analyzed the data from these facilities in order to determine the best organic indicator parameter for these treatment systems.

For each wastewater type and its associated wastewater treatment system, EPA characterized the composition of organic pollutants in all of the influent samples, in all of the effluent samples, and the total samples (influent, effluent, and intermediate sampling points) associated with the treatment system. EPA studied the correlation of the concentration of each indicator parameter noted above to the sum of the concentrations of the organic pollutants by calculating the Pearson and Spearman Rank correlation coefficients and comparing the coefficients of each parameter against each other. Additionally, EPA compared the general removal of the sum of organic pollutant compounds with the removal of each indicator parameter (see the Technical Development Document for a detailed discussion of these analyses).

EPA determined TOC to be the best overall indicator parameter for the evaluated MP&M wastestreams because this analysis measures all types of organic compounds. Total recoverable phenolics, O&G (as HEM), Total Petroleum Hydrocarbons (as SGT–HEM), and BOD_5 analyses only measure

specific organic components so they would not measure all possible organic compounds in an effluent stream.

In addition to expanding its sampling program, EPA considered a variety of approaches to address the comments on the use of O&G as an indicator for organic pollutants. EPA considered the use of a Total Organics list or an organics management plan (similar to the Total Toxic Organics (TTO) list and solvent management plan used in the Metal Finishing effluent guidelines (40 CFR 433)) as well as allowing facilities to choose from a list of possible indicator pollutants (where they would demonstrate a correlation to their wastewater) or to choose to monitor for the specific organic pollutants themselves. EPA shared these ideas with small entity representatives during the SBREFA process (see Section XXII.C for a discussion on the SBREFA process) and with stakeholders during various public meetings and industry conferences. (See Section V.E for a discussion on EPA's public outreach efforts).

EPA has decided to propose three alternatives to allow for maximum flexibility while ensuring reductions in the amount of organic pollutants discharged from MP&M facilities. EPA is proposing to require MP&M facilities within the scope of this rule to either: (1) Meet a numerical limit for the total sum of a list of specific organic pollutants (similar to the TTO parameter used in the Metal Finishing effluent guidelines); (2) meet a numerical limit for the specified indicator parameter; or (3) develop and certify the implementation of an organics management plan. (See Section XXI.C.2 for a discussion on regulatory implementation and proposed monitoring flexibility).

Variability of MP&M Process Wastewater Discharges

EPA also revised its analytical wastewater sampling program to address two other issues raised by commenters in response to the 1995 proposal. First, commenters stated that EPA's analytical data did not accurately reflect the variability in the wastewater flow and pollutant concentration experienced over time at MP&M sites. More specifically, metal finishing and electroplating job shops stated that EPA did not account for the variability of the metal types and products processed at their facilities; and therefore, EPA's proposed numerical limits did not accurately reflect pollutant concentrations achievable by these types of facilities (see Section VI.C.2. for a description of metal finishing job shops). EPA has addressed this by performing specific sampling targeted to assess the wastewater variability at metal finishing and electroplating job shops. EPA sampled raw wastewater from a variety of unit operations as well as wastewater treatment systems at three job shops for five days each. After a period of a few months, the Agency then returned to each facility a second and/or a third time for three days of analytical wastewater sampling. In addition, when determining proposed limits for the Metal Finishing Job Shops subcategory, EPA, when possible, only used data collected from metal finishing and electroplating facilities. However, EPA had to transfer data from the General Metals subcategory for several pollutants that are being proposed in the Metal Finishing Job Shops subcategory. Based on this approach, the limits for facilities in the Metal Finishing Job Shop subcategory include increased variability factors as compared to the General Metals subcategory (*i.e.,* the subcategory that EPA considers to be the most similar in terms of raw wastewater characterization).

Second, commenters stated the variability factors that EPA used in the development of limitations were relatively small. Commenters expressed their view that EPA's variability factors did not reflect the variations in raw wastewater pollutant concentrations nor the variations in the effectiveness of treatment technologies (particularly in the case of cyanide). Section VIII.B of today's preamble discusses the statistical methodology used for developing variability factors. In an effort to ensure that the variability factors represent the variability found in MP&M wastewater, EPA performed 44 sampling episodes during post-1995 proposal data collection in addition to the 27 sampling episodes performed during the Phase I data collection effort. EPA also specifically included sampling of 20 cyanide destruction systems.

In addition, the Agency has collected long-term effluent data from facility Compliance Reports and Discharge Monitoring Reports in an effort to perform a ''real world'' check on the achievability of today's proposed limits. This data is available for review in the public record for today's proposal (see Section 6.6.1 of the public record). Indirect dischargers file compliance monitoring reports with their control authority (*e.g.,* POTW) at least twice per year as required under the General Pretreatment Standards (40 CFR part 403) while direct discharges file discharge monitoring reports with their permitting authority at least once per year. The Agency received these reports from 14 well-operated BAT facilities whose analytical data EPA used in establishing limitations. EPA sent letters to nine facilities requesting this data. In addition, five sites provided EPA with this data during site visits or sampling episodes or as part of their questionnaire response. Because this data is not in a form that allows direct use for calculating limits or for comparison to the proposed limits, EPA was not able to use this data in setting or evaluating the compliance aspects of the limits and standards in today's proposal. However, following proposal, EPA will reformat and evaluate this long-term effluent monitoring data in relation to the proposed limits. In cases where EPA finds a facility in its costing database that was used to set the numerical limits and is not in compliance with the proposed pollutant limitations, EPA will reassess the achievability of these limits by a well-operated BAT system. When a system is not achieving the proposed limits consistently it may be because either the system is not achieving the projected long-term average (LTA) or the system has higher variability than EPA determined using its standard methodology. EPA requests comment on its methodology for determining LTAs and variability factors. In cases where EPA determines that improved system operation will allow the limits to be consistently achieved it will include additional treatment costs for the facility in its cost estimations for the final rule where EPA has not already done so. EPA concludes, in following the approach described above, that it will address the concerns of commenters on the Phase I proposed rule related to the achievability of the numerical limits by well operated and economically achievable treatment systems. EPA requests comment on this method of performing a ''real world'' check on the achievability of its proposed limits.

Finally, as compared to the 1995 proposed limits, today's proposed numerical limits for total cyanide have increased almost one order of magnitude from 0.03 mg/L for the daily maximum and 0.02 for the monthly average to 0.21 and 0.12, respectively. This increase is largely due to increased variability factors.

Low Discharge Flow Exclusion

Another significant change from the 1995 proposal is EPA's proposed low wastewater discharge flow exclusion (''low flow cutoff'') for indirect dischargers. In the 1995 proposed rule, EPA set a low flow cutoff at one million gallons per year (1 MGY) for all indirect

discharging facilities included in the Phase I sectors. This meant that EPA proposed to exclude, from the MP&M pretreatment standards, facilities discharging less than 1 MGY to a POTW. The Agency included the low flow cutoff to reduce the potentially large burden on POTWs related to issuing permits or other control mechanisms to thousands of the smallest MP&M Phase I sector facilities. EPA received many comments on the level of the proposed flow cutoff. Based on these comments and the recommendations of the SBREFA panel (see Section XXII.C on the SBREFA process), EPA analyzed a range of flow cutoffs for indirect dischargers ranging from no flow cutoff to 6.25 million gallons per year. EPA notes that at 6.25 million gallons per year, the General Pretreatment Standards (40 CFR part 403) classify indirect discharging facilities as ''Significant Industrial Users'' (SIUs). Under the General Pretreatment Standards, control authorities (*e.g.,* POTWs) must issue permits or other control mechanisms to SIUs and, therefore, no POTW burden reductions are realized above a flow cutoff of 6.25 MGY. (However, there may be some minimal increase in burden for modifying permits or control mechanisms).

EPA estimates that there are a total of 89,000 facilities within the scope of the proposed rule. Many of these facilities are small facilities and may be contributing minimal pollutant loadings to the environment. A low flow exclusion allows regulatory authorities to focus attention on those facilities with significant discharges. This may also improve the cost-effectiveness of the rule. In developing today's proposal, EPA considered POTW burden, costs, pollutant removals, and economic impacts of the various flow cutoffs.

Unlike the 1995 proposal, EPA is now proposing to subcategorize (*i.e.,* subdivide) the MP&M category (see Section VI of this preamble for a discussion on subcategorization of the industry). Therefore, EPA has analyzed the various low flow cutoffs by subcategory, noting in particular which subcategories are not currently covered under existing pretreatment standards. When existing pretreatment standards already cover all facilities in a particular subcategory, POTWs will not be relieved of their administrative burden, regardless of whether or not a low flow exclusion exists in the MP&M pretreatment standards. But other factors, such as a disproportionate economic impact have been considered.

The combination of subcategorization of the industry, current coverage under existing pretreatment standards, and analysis of a range of low flow cutoffs has led EPA to propose different levels for the low flow exclusion for indirect dischargers in various subcategories. For example, EPA is proposing the 1 MGY cutoff for indirect dischargers in the General Metals subcategory, but is proposing no flow cutoff for indirect dischargers in the Printed Wiring Board subcategory (see Section VI.C. for descriptions of the proposed subcategories). This difference is partially due to the fact that under the Electroplating and Metal Finishing pretreatment standards (40 CFR parts 413 and 433), EPA already regulates (thus it already requires POTWs to issue control mechanisms for) all indirect discharging facilities in the proposed Printed Wiring Board subcategory (approximately 620 facilities). In addition, EPA does not project any severe or moderate economic impacts for the small estimated number of printed wiring board facilities (52) that would be eligible for a low flow cutoff of 1 MGY. In contrast, EPA has not previously established pretreatment standards for approximately 75 percent of the indirect discharging facilities in the proposed General Metals subcategory (approximately 26,000 total facilities). Approximately 23,000 indirect dischargers in the proposed General Metals Subcategory discharge less than 1 MGY. If EPA did not exclude these facilities, the number of permit issuances that POTWs are responsible for would increase significantly. There are approximately 30,000 industrial users currently covered nationally by existing pretreatment standards for all effluent guidelines. Low flow exclusions being proposed for the General Metals and Oily Wastes subcategories, POTWs (or other control authorities) would have to issue an additional 51,000 permits/control mechanisms. EPA discusses further the rationale for proposing a low flow cutoff exclusion for certain subcategories in Section XII.

Mass-Based v. Concentration-Based Limits

EPA also received many comments on the issue of mass-based versus concentration-based limits. In the 1995 proposal, EPA proposed concentration-based limits with the requirement that control authorities (*e.g.,* POTWs) implement them as mass-based limits. EPA notes that under the NPDES permit program, the Agency already requires permit writers to implement effluent limitations guidelines as mass-based limits whenever feasible (40 CFR 122.45(f)). EPA proposed requiring this conversion to mass-based limits because the Agency believed that it was necessary to ensure the use of water conservation and pollution prevention practices similar to those that were part of EPA's selected option (60 FR 28230). EPA expected permit writers and control authorities to use historical flow as a basis for the conversion to mass-based limits for facilities that demonstrated good water conservation practices. However, for facilities that did not have good water conservation in place, EPA provided detailed guidance to permit writers and control authorities in the Technical Development Document (TDD) for the 1995 proposal. The TDD included information on a full range of water use levels (in gallons/sq.ft.) for a large variety of MP&M operations as well as guidance on how permit writers and control authorities could determine if a facility was using good water conservation practices.

EPA received comments on the administrative burden on POTWs associated with implementation of mass-based limits. The commenters stated that the burden was largely due to the fact that most MP&M facilities do not collect production information on a wastestream-by-wastestream basis. POTWs have continued to voice these concerns at recent public stakeholder meetings. To address this issue, EPA collected additional MP&M unit operation-specific information on pollution prevention practices, water use, and wastewater generation in the data collection efforts that followed the Phase I proposal.

In today's proposal, EPA is again proposing concentration-based limits (for all but one subcategory) and is providing detailed information on water use levels for specific unit operations in the Technical Development Document. However, the Agency is no longer proposing to require control authorities (*e.g.,* POTWs) or permit writers to implement the limits on a mass basis. Instead EPA is proposing to authorize control authorities and permit writers to decide when it is most appropriate to implement mass-based limits. EPA believes that this approach will reduce implementation burden on POTWs and will result in increased use of water conservation practices at the facilities where POTWs and permit writers think it is most needed. EPA believes that MP&M facilities that use the best pollution prevention and water conservation practices may request that the control authority or permit writer use mass-based limits in their permits or other control mechanisms. (See Section XXI.B for a discussion on regulatory implementation).

III. Scope of Proposal

Today's proposed effluent guideline applies to process wastewater discharges from existing or new industrial sites engaged in manufacturing, rebuilding, or maintenance of metal parts, products or machines to be used in one of the following industrial sectors:

- Aerospace;
- Aircraft;
- Bus and Truck;
- Electronic Equipment;
- Hardware;
- Household Equipment;
- Instruments;
- Job Shops;
- Mobile Industrial Equipment;
- Motor Vehicle;
- Office Machine;
- Ordnance;
- Precious Metals and Jewelry;
- Printed Wiring Boards;
- Railroad;
- Ships and Boats;
- Stationary Industrial Equipment; and
- Miscellaneous Metal Products.

EPA has identified these eighteen industrial sectors in the MP&M category; these sectors manufacture, maintain and rebuild metal products under more than 200 different SIC codes. See Appendix A of today's proposed rule for a description of typical products within these eighteen MP&M industrial sectors. Although EPA is using these 18 industrial sectors to generally describe the scope of today's proposal, the Agency notes that it is not using these industrial sectors to subcategorize (or subdivide) the regulations for the industry. EPA's analysis to date suggests that the industrial sectors do not correlate well with the types of waste generated, and many facilities perform operations covered by multiple sectors. Instead, EPA is proposing to define subcategories based on unit operations performed and the nature of the waste generated (see Section VI of today's notice for a discussions on subcategorization and subcategory-specific applicability).

EPA does not intend to include maintenance or repair of metal parts, products, or machines that occur only as ancillary activities at facilities that it did not include in the 18 industrial sectors. (See § 438.1(d)). EPA believes that these ancillary repair and maintenance activities would typically generate only small quantities of wastewater. In most cases, these periodic repair and maintenance activities at facilities not in one of the 18 industrial sectors would comprise only a very small portion of the total wastewater flow at the facility. The Agency believes local limits will be adequate to address these discharges for indirect dischargers and that permit writers can establish limits using Best Professional Judgement (BPJ) to regulate these ancillary waste streams for direct dischargers. Permit writers should consult the effluent limitations guidelines and standards for the primary category of such a facility (See 40 CFR Chapter I, Subchapter N for all existing effluent limitations guidelines and standards). As an example, EPA does not intend for the MP&M proposal to include process wastewater discharges from an on-site machine or maintenance shop at a facility engaged in the manufacture of organic chemicals when the facility operates that shop to maintain the equipment related to manufacturing their products (*i.e.,* organic chemicals). As discussed above, these wastewaters can be regulated through local limits or through BPJ using the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) regulations. Alternatively, since aircraft is an in-scope MP&M industrial sector, EPA is proposing to include process wastewater discharges from activities related to maintaining or repairing aircraft or other related (metal) equipment (*e.g.,* deicing vehicles) at airports.

EPA also intends to cover wastewater from MP&M operations related to maintenance and repair of metal products, parts, and machinery at military installations. For example, this proposal includes wastewater generated from the maintenance and repair of aircraft, cars, trucks, buses, tanks (or other armor personnel carriers), and industrial equipment—all of which are commonly performed at military installations.

Today's proposal only covers process wastewater generated at MP&M facilities. EPA is not covering non-process wastewater which includes sanitary wastewater, non-contact cooling water, and storm water. EPA has characterized typical MP&M unit operations as belonging to one or more of the following types: Assembly/disassembly; metal deposition; metal shaping; organic deposition; printed wiring board; surface finishing; surface preparation; and dry dock operations. Typical unit operations at MP&M facilities include any one or more of the following: abrasive blasting, abrasive jet machining, acid treatment, adhesive bonding, alkaline cleaning for removal of oil, alkaline treatment, anodizing, aqueous degreasing, assembly, barrel finishing, brazing, burnishing, calibration, chemical conversion coating, chemical milling, chromate conversion coating, corrosion preventive coating, disassembly, electrical discharge machining, electrochemical machining, electroless plating, electrolytic cleaning, electroplating, electron beam machining, electropolishing, floor cleaning, grinding, heat treating, hot-dip coating, impact deformation, laminating, laser beam machining, machining, metal spraying, painting (spray/brush or immersion), photo resist applications, physical vapor deposition, plating, plasma arc machining, polishing, pressure deformation, rinsing, salt bath descaling, soldering, solvent degreasing, sputtering, stripping (paint or metallic coating), testing, thermal cutting, thermal infusion, ultrasonic machining, vacuum metalizing, washing finished product, welding, wet air pollution control, and numerous sub-operations within those listed above. EPA notes that not all MP&M unit operations generate process wastewater. In addition, many of these operations frequently have associated rinses that remove materials that preceding processes deposit on the surface of the workpiece and water-discharging air pollution control devices which become contaminated with process contaminants removed from the air. EPA is including both of these wastewater flows under the scope of today's proposed regulation. (See § 438.2(e)).

The Agency is also including under today's proposed regulation wastewater discharges from non-contact, nondestructive testing performed at MP&M facilities. (See § 438.2(e)). A common source of ''nondestructive testing'' wastewater is photographic waste from nondestructive X-ray examination of parts. The Agency is proposing to cover this wastewater because of the potential concentration of silver in the wastewater discharge.

EPA is not covering wastewater generated from electroplating-type operations during semiconductor wafer manufacturing or wafer fabrication processes (*i.e.,* tape automated bonding—''TAB'' and controlled collapse chip connection—''C–4'') occurring in a ''clean room'' environment because it believes that these operations are much different than the other electroplating operations that EPA is covering by these guidelines and do not contribute significant amounts of pollutants to the wastewater discharge. (See § 438.1(e)). The new and emerging technologies involved in semiconductor wafer fabrication add microscopic amounts of metal (usually copper) to only selective portions of the wafer to

enhance circuitry and decrease wafer size. Other electroplating operations that EPA is proposing to cover under this guideline generally occur on a larger scale and produce a more concentrated metal-bearing wastewater. Moreover, the wafer fabrication processes occur in a clean room with a highly-controlled atmosphere and using highly-purified materials and specialized tools that are much different from typical metal-finishing equipment. These specialized tools and conditions enable the manufacturer to add microscopic levels (less than one micron) of metal to only one side of the wafer, in contrast to the non-selective, macroscopic (micron to micron-inch) plating used in common metal finishing. Therefore, EPA is proposing not to cover wastewater from wafer fabrication processes under this rule. However, in today's proposal the Agency is covering wastewater generated from electroplating during semiconductor final wafer assembly. (See § 438.1(e)).

EPA is proposing to cover wastewater generated from washing vehicles only when it occurs as a preparatory step prior to performing an MP&M unit operation (*e.g.,* prior to disassembly to perform engine maintenance or rebuilding). (See § 438.1(f)). MP&M facilities may perform these preparatory washes to remove oils, dirt and grit prior to performing the maintenance or repair operations and as a result the combined wastewater contains significant amounts of oil and grease along with total suspended solids. However, this proposed regulation does not cover the washing of cars, aircraft or other vehicles when it is performed only for aesthetic/cosmetic purposes because EPA does not expect these washes to contain significant concentrations of pollutants. (See § 438.1(f)).

EPA is also proposing to cover wastewater generated from unit operations performed by drum reconditioners/refurbishers to prepare drums for reuse. (See § 438.1(a)). These facilities perform operations on metal drums such as chaining, caustic washing, acid cleaning, acid etching, impact deformation, leak testing, corrosion inhibition, shot blasting, and painting. The Agency considers facilities that perform these operations as part of the Stationary Industrial Equipment sector. However, the Agency notes that it is currently considering the development of an effluent guideline for the drum reconditioning industry. If EPA develops regulations for this new industrial category, it is possible that the Agency would cover these facilities under that rule and not under the MP&M regulation. EPA solicits comment on whether these facilities would be more appropriately covered under the MP&M rule or under a new industrial category for drum reconditioners.

EPA did not collect information with respect to MP&M operations at gasoline service stations (SIC code 5541), passenger car rental facilities (SIC code 7514), or utility trailer and recreational vehicle rental facilities (SIC code 7519); therefore, this proposed regulation does not cover process wastewater generated by maintenance and repair activities when they occur at gasoline stations or car rental facilities. (See § 438.1(g)). As discussed in Sections VI.C and XII of this notice, EPA is proposing to exclude facilities in the General Metals and Oily Waste subcategories that discharge MP&M process wastewater below a specified flow rate (one and two million gallons per year, respectively). EPA expects that many facilities that only perform repair and maintenance activities (*e.g.,* auto repair shops, light aircraft maintenance) will be excluded as most will fit into the applicability of either the General Metals or Oily Waste subcategories and have process wastewater discharges below the subcategory-specific flow cutoffs.

EPA is proposing to cover MP&M process wastewater at mixed-use facilities (*i.e.,* any municipal, private, U.S. military or federal facility which contains both industrial and commercial/administrative buildings at which one or more industrial sites conduct operations within the facility's boundaries). (See § 438.1(h)). However, unlike the typical industrial facility, such as an aircraft or electronic equipment manufacturing plant with one primary manufacturing activity, the majority of military installations are mixed-use facilities and are more like municipalities with several small industries as well as other operations within their boundaries. Many of these installations also include a variety of tenant activities, including contractor and other Department of Defense federal agency activities. At these mixed-use facilities, EPA is proposing to cover wastewater from manufacturing, maintenance and repair activities performed on metal parts, products or machines (*e.g.* maintenance and repair of vehicles and aircraft). (See § 438.1(h)). EPA concluded that these types of operations will generate wastewater containing either high metals content or high oil and grease, or both. EPA is not proposing to cover wastewater from other non-metal repair, maintenance or manufacturing operations at mixed-use facilities such as wastewater from residential housing, schools, churches, recreational parks, shopping centers, gas stations, utility plants, and hospitals. The Agency believes that wastewater generated from these activities will not contain the same types and concentrations of pollutants (such as metals and oil and grease) as wastewater from MP&M operations. Finally, the geographic size of many military installations (for example, over 300 square miles at Fort Hood, TX and over 1.1 million acres at the China Lake Naval Air Warfare Center, CA) makes it difficult to treat them as a single facility. Therefore, EPA is proposing to allow wastewater generated at different sites (individual buildings as well as outdoor locations where manufacturing, rebuilding, or maintenance occur on metal parts, products, or machines) within a mixed-use facility to be dealt with as separate discharges for the purpose of applying the appropriate low flow cutoff (when applicable). EPA is proposing to allow the control authority to use its discretion in determining which wastewater discharges can be considered separate discharges for the purposes of applying the appropriate low flow cutoff (when applicable). The determination would likely be based on the degree of proximity between industrial operations and a practical application of the requirements for applicable MP&M subcategories. Control authorities (and permit writers) will have to determine when it is appropriate to apply standards for more than one subcategory to a mixed-use facility and when to use the combined waste stream formula (or building block approach). For example, a military installation that generates wastewater from vehicle maintenance operations that is treated in a separate wastewater system than wastewater generated from its metal finishing operations could be covered by both the Oily Wastes subcategory for its vehicle maintenance operations and by the General Metals subcategory for it surface finishing operations. (See Section VI for a discussion of subcategorization and subcategory-specific applicability).

EPA seeks information from other facilities that believe they would fall within this mixed-use facility category. In addition, EPA seeks comments on the choice to allow control authorities to make a determination concerning applying the low flow cutoffs to separate discharges and the factors for making such a decision as well as alternative ways to divide a mixed-use facility.

See Section II.B for a discussion on the applicability of today's proposed rule with respect to the thirteen existing

metals-related effluent limitations guidelines and standards regulations.

IV. Industry Description

As described in Section III, the MP&M industry is comprised of facilities that manufacture, rebuild, or maintain metal parts, products or machines to be used in one of 18 industrial sectors. Based on results of the MP&M survey database, there are an estimated 89,000 MP&M sites. Based on detailed survey results, an estimated 63,000 MP&M sites discharge process water. Of the facilities discharging process wastewater, EPA estimates that 93 percent are indirect dischargers and 7 percent are direct dischargers. The Agency estimates that there are approximately 26,000 facilities that fall into one of three zero discharge categories: zero discharge, non-water-using, or contract haulers.

MP&M water-discharging sites range in size from less than 10 employees to sites with tens of thousands of employees and from wastewater discharge flow rates of less than 100 gallons per year to wastewater discharge flow rates exceeding 100 million gallons per year. Of water discharging facilities, approximately 98 percent of MP&M sites have 500 or fewer employees and approximately 78 percent of MP&M sites have 100 or fewer employees. EPA estimates that facilities with less than 100 employees discharge approximately 11 percent of the total annual wastewater discharged by the MP&M industry and that facilities having between 100 and 500 employees discharge approximately 50% of the industry total flow. Facilities with greater than 500 employees discharge 39 percent of the industry total.

MP&M facilities are located throughout the United States. The Agency received survey data from every EPA region and 48 separate states. EPA estimates that the largest concentrations of MP&M facilities are located in EPA Regions III (MD, PA, VA, WV), V (IL, IN, MI, MN, OH, WI), and IX (AZ, CA, HI). In addition EPA estimates the seven states with the largest concentrations of MP&M facilities are: California (25 percent), Pennsylvania (23 percent), Virginia (11 percent), Ohio (5 percent), Colorado (4 percent), Texas (3 percent), and Indiana (2 percent).

EPA estimates that approximately 3 percent of the industry (water dischargers and zero dischargers) generates annual revenues less than $100,000, approximately 41 percent generate annual revenues between $100,000 and $500,000, approximately 5 percent generate annual revenues between $500,000 and $1,500,000, and approximately 33 percent generate over $5,000,000 annual revenues. The Agency notes that facilities with annual revenues greater than $5,000,000 discharge approximately 73 percent of the total wastewater discharged by the industry.

Although facilities in the MP&M industry produce a wide range of products, the operations performed can be described by two types of activities: manufacturing, and rebuilding/maintenance. Manufacturing is the series of unit operations necessary to produce metal products, and is generally performed in a production environment. Rebuilding/maintenance is the series of unit operations necessary to disassemble used metal products into components, replace the components or subassemblies or restore them to original function, and reassemble the metal product. These operations are intended to keep metal products in operating condition and can be performed in either a production or a non-production environment.

Table IV–1, below, summarizes the estimated number of MP&M sites (water dischargers and zero dischargers) and total discharge flow (prior to implementation of the proposed rule) by activity or activity combination. The largest number of sites, approximately 44,000, perform ''rebuilding/maintenance only'' and account for approximately 9 percent of the total estimated discharge flow for the industry. ''Manufacturing only'' represents the next largest number of facilities (27,000) and represents the largest percentage of the total estimated discharge flow for the industry (75.2 percent).

TABLE IV–1.—MP&M SITES* AND TOTAL DISCHARGE FLOW BY ACTIVITY COMBINATION

Activity	Estimated number of water discharging MP&M sites	Total estimated discharge flow (million gal/yr)	Percentage of total water discharging MP&M sites	Percentage of total discharge flow
Manufacturing, Rebuilding/Maintenance	7,400	11,200	8.3	9.1
Manufacturing Only	27,000	91,700	30.4	75.2
Rebuilding/Maintenance Only	44,000	11,100	49.5	9.1
Unknown/others	10,500	8,100	11.8	6.6
Total**	89,000	122,000	100.0	100.0

*This table includes all MP&M sites, for a presentation of this distribution for water discharging sites only, see the Technical Development Document for today's proposal.

**Totals may not add due to rounding.

Of the 26,000 sites that achieve zero discharge of process wastewater, many use but do not discharge process water. Based on information from the MP&M Detailed Surveys, site visits, and technical literature (see Section V for a discussion of the data collection activities), these sites achieve zero discharge of process wastewater in one or more of the following ways:

- Sites contract haul for off-site disposal all process wastewater generated on site;
- Sites discharge process wastewater to either on-site septic systems or deep-well injection systems;
- Sites perform end-of-pipe treatment and reuse all process wastewater generated on site;
- Sites perform either in-process or end-of-pipe evaporation to eliminate wastewater discharges; or
- Sites perform in-process recirculation and recycling to eliminate wastewater discharges.

EPA's Underground Injection Control (UIC) Program, authorized by the Safe Drinking Water Act, regulates shallow on-site systems and deep wells that discharge fluids or wastewater into the subsurface and thus may endanger underground sources of drinking water.

If a facility disposes any wastewater (other than solely sanitary waste) into a shallow disposal system (*e.g.,* septic system or a floor drain connected to a dry well) that well is covered by the UIC program. If you think you have a UIC

disposal well on your facility, you should contact your State UIC Program authority to determine your compliance status.

EPA published the Class V Rule in the **Federal Register** on December 7, 1999 (64 FR 68545), which affected facilities using on site systems to dispose waste associated with motor vehicle service and repair in state-designated groundwater protection areas. The EPA is scheduled to develop additional requirements for other Class V wells that receive endangering waste. Contact your State UIC Program for more information on these developing regulations.

V. Summary of Data Collection Activities

A. Existing Data Sources

While developing today's proposal, EPA reviewed data from other metals industry effluent guidelines, the National Risk Management Research Laboratory (NRMRL) treatability database, the 50 POTW Study, the Domestic Sewage Study, and the Toxics Release Inventory (TRI).

For the MP&M technology effectiveness assessment effort, EPA reviewed sampling data collected to characterize treatment systems for the development of effluent guidelines for other metals industries (see Section II.B for a discussion on other metals industry effluent guidelines). For several previous effluent guidelines, EPA used treatment data from metals industries to develop the Combined Metals Database (CMDB), which served as the basis for developing limits for these industries. EPA also developed a separate database used as the basis for limits for the Metal Finishing category. EPA used the CMDB and Metal Finishing data as a guide in identifying well-designed and well-operated MP&M treatment systems. EPA did not use these data in developing the MP&M technology effectiveness concentrations, since the Agency collected sufficient data from MP&M sites to develop technology effectiveness concentrations.

EPA also reviewed the Technical Development Documents (TDDs), sampling episode reports, and supporting record materials for the other metals industries' rulemakings to identify available data. EPA used these data for the preliminary assessment of the MP&M industry, but did not use these data for estimating MP&M pollutant loadings because EPA obtained sufficient data for the MP&M sampling program to characterize the MP&M unit operations.

EPA's National Risk Management Research Laboratory (NRMRL) developed a treatability database (formerly called the Risk Reduction Engineering Laboratory (RREL) database) to provide data on the removal and destruction of chemicals in various types of media, including water, soil, debris, sludge, and sediment. This database contains treatability data from POTWs and industrial facilities for various pollutants. The database includes physical and chemical data for each pollutant, the types of treatment used to treat the specific pollutants, the types of wastewater treated, the size of the POTW or industrial site, and the treatment concentrations achieved. EPA used this database as one means to assess removal of MP&M pollutants of concern by POTWs.

In September 1982, EPA published the *Fate of Priority Pollutants in Publicly Owned Treatment Works*, referred to as the 50 POTW Study. The purpose of this study was to generate, compile, and report data on the occurrence and fate of the 129 priority pollutants in 50 POTWs. The report presents all of the data collected, the results of preliminary evaluations of these data, and the results of calculations to determine the quantity of priority pollutants in the influent to POTWs; discharged from the POTWs; in the effluent from intermediate process streams; and in the POTW sludge streams. EPA used the data from this study as one means to assess removal by POTWs of MP&M pollutants of concern (see Section XII.A for additional discussion on the use of the 50 POTW Study).

In February 1986, EPA issued the ''Report to Congress on the Discharge of Hazardous Wastes to Publicly Owned Treatment Works'', referred to as the Domestic Sewage Study (DSS). This report, which was based in part on the 50 POTW Study, revealed a significant number of sites discharging pollutants to POTWs, which are a threat to the treatment capability of the POTW. These pollutants were not regulated by national categorical pretreatment standards at that time. EPA used the information in the DSS in developing the Preliminary Data Summary (PDS) for the MP&M category (October 1989).

The Toxics Release Inventory (TRI) database contains specific toxic chemical release and transfer information from manufacturing facilities throughout the United States. EPA considered using the TRI database in developing the MP&M effluent guidelines. However, EPA did not use TRI data on wastewater discharges from MP&M sites because sufficient data were not available for effluent guidelines development. For example, in developing the MP&M effluent guidelines, EPA uses wastewater influent concentrations to characterize a facility's wastewater and to calculate treatment efficiency (*i.e.,* percent removal across the treatment system). TRI does not provide concentrations for the influent to a facility's treatment system. EPA also did not use the data on wastewater discharge because many MP&M sites do not meet the reporting thresholds for the TRI database.

B. Survey Questionnaires

As discussed in Section II.C, EPA originally intended to propose the MP&M rulemaking in two phases. Therefore, EPA's data collection efforts, particularly the use of survey questionnaires, was handled in two phases to collect data from the relevant industrial sectors. EPA distributed two screener and six detailed questionnaires (surveys) between 1989 and 1996. For a list of surveys by distribution date, see the Technical Development Document for today's proposed rule.

1. Screener Surveys

EPA developed and distributed two screener surveys. In 1990, EPA distributed 8,342 screener surveys to sites believed to be engaged in the original seven Phase I MP&M sectors. In 1996, EPA distributed 5,325 screener surveys to sites believed to be engaged in the eleven Phase II MP&M sectors. The purpose of the screener surveys was to identify sites to receive the more detailed follow-up surveys and to make a preliminary assessment of the MP&M industry.

In each case, EPA identified the SIC codes applicable to the respective MP&M sectors and then calculated the number of sites to receive the screener within each SIC code by a coefficient of variation (CV) minimization procedure (see the respective Database Summary Reports for the screener surveys in the public record for a detailed discussion of the CV procedure). Based on the number of sites selected within each SIC code, the Agency purchased a list of randomly selected names and addresses from Dun & Bradstreet. This list included twice the number of sites specified by the CV minimization procedure for each SIC code. Dun & Bradstreet randomly selected the requested number of sites from the Dun & Bradstreet database for each SIC code. From this list of potential recipient sites, the Agency randomly selected sites to receive the screener surveys. For a more detailed discussion on the screener surveys, see the Technical

Development Document for today's proposed rule.

EPA also sent the 1996 screener survey to 1,750 randomly selected sites in Ohio for the purpose of collecting information for an environmental benefits study. (See Section XX.F or the Economic, Environmental, and Benefits Analysis for today's proposed rule for a detailed discussion of EPA's Ohio Benefits Case Study).

2. Industrial Detailed Surveys

Based on responses to the 1990 screener, EPA sent a more detailed survey to a select group of water-using MP&M sites. The Agency designed this survey to collect detailed technical and financial information. EPA selected 1,020 detailed survey recipients from the following three groups of sites:

- Water-discharging 1989 screener respondents (860 sites);
- Water-using 1989 screener respondents that did not discharge process water (74 sites); and
- Water-discharging sites from well-known MP&M companies that did not receive the 1989 screener (86 sites).

EPA used information from the first two groups of survey recipients to develop pollutant loadings and reductions and to develop compliance cost estimates. Because EPA did not randomly select the third group of recipients, EPA did not use the data to develop national estimates.

In an effort to reduce burden on survey recipients for the second phase of the data collection effort, EPA developed two similar detailed surveys. Based on the development of the 1995 MP&M proposal, EPA chose to collect more detailed information from sites with annual process wastewater discharges greater than one million gallons per year (1 MGY). EPA sent the ''long'' detailed survey to all 353 1996 screener respondents who indicated they discharged one million or more gallons of MP&M process wastewater annually and performed MP&M operations. The Agency sent the ''short'' detailed survey to 101 randomly selected 1996 screener respondents who indicated they discharged less than one million gallons of MP&M process wastewater annually and performed MP&M operations.

The detailed surveys collected information to identify the site location and contact person, number of employees, facility age, process wastewater discharge status and destination, and wastewater discharge permits and permitting authority as well as general information about metal types processed, MP&M products and production levels, water use for unit operations, and wastewater discharge from unit operations. EPA used the process information to evaluate water use and discharge practices and sources of pollutants for each MP&M unit operation. EPA also requested detailed information on MP&M wet unit operations, pollution prevention practices, wastewater treatment technologies, costs for water use and wastewater treatment systems, and wastewater/sludge disposal costs. EPA also requested each site to provide block diagrams of the production process and the wastewater treatment system. The unit operation information included: metal types processed, production rate, operating schedule, chemical additives, volume and destination of process wastewater and rinse waters, in-process pollution prevention technologies, and in-process flow control technologies. The information EPA requested for each wastewater treatment unit included: operating flow rate, design capacity, operating time, chemical additives, and unit operations discharging to each treatment unit. In addition, EPA asked each site to provide the type of MP&M wastewater sampling data collected. EPA used these data to characterize the industry, to perform subcategorization analyses, to identify best management practices, to evaluate performance of the treatment technology for inclusion in the regulatory options, and to develop regulatory compliance cost estimates.

EPA also collected detailed financial and economic information about the site or the company owning the site. In addition, the 1996 long detailed questionnaire included a section that requested supplemental information on other MP&M facilities owned by the company. EPA included this voluntary section to measure the combined impact of proposed MP&M effluent guidelines on companies with multiple MP&M facilities that discharge process wastewater. This section requested the same information collected in the 1996 MP&M screener survey. Responses to questions in this section provided the size, industrial sector, revenue, unit operations, and water usage of the company's other MP&M facilities.

The 1996 short survey included the identical general site and process information and economic information collected in the long detailed survey. However, to minimize the burden on facilities discharging less than one million gallons of process wastewater, EPA did not require these facilities to provide the detailed information on MP&M unit operations or treatment technologies that the Agency requested in the long survey. For a question-by-question comparison of the short and long 1996 detailed surveys, see the Technical Development Document for today's proposed rule.

Finally, EPA developed a detailed survey, under a separate rulemaking effort, to collect detailed information from facilities that are currently covered by the Iron and Steel Manufacturing effluent guidelines. Following field sampling of iron and steel sites and review of the completed industry surveys, EPA decided that some iron and steel operations would be more appropriately covered by the MP&M rule because they were more like MP&M operations (see Section VI.C.5 for a discussion on the Steel Forming & Finishing subcategory). Based on EPA's decision regarding these operations, the Agency coded and entered process information from 47 iron and steel surveys into the MP&M costing input database.

3. Municipality Survey

EPA distributed the municipality surveys in 1996 to city and county facilities that might operate MP&M facilities. The Agency designed this survey to measure the impact of this rule on municipalities and other government entities that perform maintenance and rebuilding operations on MP&M products (*e.g.,* bus and truck, automobiles).

The Agency sent the municipality survey to 150 city and county facilities randomly selected from the *Municipality Year Book–1995* based on population and geographic location. EPA allocated sixty percent of the sample to municipalities and 40 percent to counties. The 60/40 distribution was approximately proportional to their aggregate populations in the frame. EPA divided the municipality sample and the county sample into three size groupings as measured by population. For municipalities, the population groupings were: less than 10,000 residents, 10,000–50,000 residents, and 50,000 or more residents. For counties, the population groupings were: less than 50,000 residents, 50,000–150,000 residents, and 150,000 or more residents. The geographic stratification conformed to the Census definitions of Northeast, North Central, South, Pacific, and Mountain states. The technical questions in the Municipality Survey were basically identical to the 1996 short detailed survey; however, EPA adapted the financial and economic questions so that they were appropriate for these facilities.

4. Federal Facilities Survey

In April 1998, EPA distributed the federal facilities detailed survey to the following federal agencies:

- Department of Energy;
- Department of Defense;
- National Aeronautics and Space Administration (NASA);
- Department of Transportation (including the United States Coast Guard);
- Department of the Interior;
- Department of Agriculture; and
- United States Postal Service.

EPA designed this survey to assess the impact of the MP&M effluent limitations guidelines and standards on federal agencies that operate MP&M facilities. EPA distributed the survey to federal agencies likely to perform industrial operations on metal products or machines. The Agency requested that the representatives of the seven listed federal agencies voluntarily distribute copies of the survey to sites they believed performed MP&M operations. The information collected in the 1996 federal survey was identical to the long survey. After engineering review and coding, EPA entered data from 44 federal surveys into the database. Because EPA did not randomly select the survey recipients, data from these questionnaires was not used to develop national estimates.

5. POTW Survey

EPA distributed the Publicly Owned Treatment Works (POTW) survey in November 1997. The Agency designed this survey to estimate benefits associated with implementation of the MP&M regulations and to estimate possible costs and burden that POTWs might incur in writing MP&M permits or other control mechanisms. The Agency sent the POTW survey to 150 POTWs with flow rates greater than 0.50 million gallons per day. EPA randomly selected the recipients from the 1992 Needs Survey Review, Update, and Query System Database (RUQus). The Agency divided the POTW sample into two strata by daily flow rates: 0.50 to 2.50 million gallons, and 2.50 million gallons or more.

In addition to the total volume of wastewater treated at the site, the POTW survey requested the number of industrial permits written, the cost to write the permits, the permitting fee structure, the percentage of industrial dischargers covered by National Categorical Standards (*i.e.,* effluent guidelines), and the percentage of permits requiring expensive administrative activities. EPA used this information to estimate administrative burden and costs. In addition, EPA requested information on the use or disposal of sewage sludge generated by the POTW. The Agency only required POTWs that received discharges from an MP&M facility to complete those questions. The sewage sludge information requested included the amount generated, use or disposal method, metal levels, use or disposal costs, and the percentage of metal loadings from MP&M facilities. The Agency used this information to assess the potential changes in sludge handling resulting from the MP&M rule and to estimate economic benefits to the POTW (See Section XIX.B.2 for a discussion of the results of the POTW survey.)

C. Wastewater Sampling and Site Visits

The Agency visited 201 MP&M sites to collect information about MP&M unit operations, water use practices, pollution prevention and treatment technologies, and waste disposal methods, and to evaluate sites for potential inclusion in the MP&M sampling program (described below). In general, the Agency visited sites to encompass the range of sectors, unit operations, and wastewater treatment technologies within the MP&M industry.

The Agency based site selection on information contained in the MP&M screener and detailed surveys. The Agency also contacted regional EPA personnel, state environmental agency personnel, and local pretreatment coordinators to identify MP&M sites believed to be operating in-process source reduction and recycling technologies or end-of-pipe wastewater treatment technologies. The Agency also attempted to visit sites of various sizes. EPA visited sites with wastewater flows ranging from less than 200 gallons per day to more than 1,000,000 gallons per day. Site-specific selection criteria are discussed in site visit reports (SVRs) prepared for each site visited by EPA.

In addition to performing site visits, EPA conducted wastewater sampling episodes at 72 sites to obtain data on the characteristics of MP&M wastewater and solid wastes, and to assess the following: The loading of pollutants to surface waters and POTWs from MP&M sites; the effectiveness of technologies designed to reduce and remove pollutants from MP&M wastewater; design and operational parameters; and the variation of MP&M wastewater characteristics across unit operations, metal types processed in each unit operation, and sectors.

The Agency used information collected during MP&M site visits to identify candidate sites for sampling. The Agency used the following general criteria to select sites for sampling:

- The site performed MP&M unit operations EPA was evaluating for development of the MP&M regulation;
- The site processed metals through MP&M unit operations for which the metal type/unit operation combination needed to be characterized for the sampling database;
- The site performed in-process source reduction, recycling, or end-of-pipe treatment technologies that EPA was evaluating for technology option development; and
- The site performed unit operations in a sector that EPA was evaluating for development of the MP&M regulation.

The Agency also attempted to sample at sites of various sizes. EPA sampled at sites with wastewater flows ranging from less than 200 gallons per day to more than 1,000,000 gallons per day.

In addition, EPA worked with several stakeholders to collect site visit and sampling data from MP&M facilities. Following the 1995 proposal of the Phase I MP&M rule, the Association of American Railroads (AAR), the Hampton Roads Sanitation District (HRSD), and the Los Angeles County Sanitation Districts (LACSD) proposed potential sampling sites to the Agency, and EPA visited these sites to identify candidates for sampling. After conducting site visits, EPA selected five sites for sampling episodes to characterize end-of-pipe treatment technologies in metal finishing and aircraft parts job shops and the railroad and shipbuilding industrial sectors. EPA prepared detailed sampling plans based on the information collected during the five site visits, and supported AAR, HRSD and LACSD sampling episodes for the collection of wastewater samples, and EPA prepared the sampling episode reports.

The Agency collected the following types of information during each sampling episode:

- Dates and times of sample collection;
- Flow data corresponding to each sample;
- Production data corresponding to each sample of wastewater from MP&M unit operations;
- Design and operating parameters for source reduction, recycling, and treatment technologies characterized during sampling;
- Information about site operations that had changed since the site visit or that were not included in the SVR; and
- Temperature and pH of the sampled wastestreams.

EPA documented all data collected during sampling episodes in the

sampling episode report (SER) for each sampled site which are located in the MP&M Administrative Record. Non-confidential information from these reports is available in the public record for this proposal. For detailed information on sampling and preservation procedures, analytical methods, and quality assurance/quality control procedures see the Technical Development Document for today's proposed rule.

D. Industry Submitted Data

EPA evaluated other industry data in developing the MP&M effluent guidelines. The data sources reviewed include: public comments to the 1995 MP&M Phase I proposed rule; the Metal Finishing F006 Benchmark Study (September 1998); data supporting the 180-Day Accumulation Time Under RCRA for Waste Water Treatment Sludges From the Metal Finishing Industry Final Rule (65 FR 12377, March 8, 2000); data provided by the Aluminum Anodizing Council (AAC), the American Wire Producers Association (AWPA), and the Aerospace Association; data and storm water pollution prevention plans provided by several shipbuilding sites, and data from periodic compliance monitoring reports/discharge monitoring reports for several sites that were part of EPA's wastewater sampling program. Data submitted with the MP&M Phase I comments did not include the quality control data required to verify the accuracy of sample analyses and, therefore, EPA did not use the data. These data sources are located in the MP&M Administrative Record. Non-confidential information is available in the public record for this proposal.

E. Summary of Public Participation

EPA has met regularly with industry trade associations and their members at various association annual meetings and conferences. There are over 20 trade associations that represent facilities that were part of the initial scope of the MP&M proposed rule. These trade associations have formed an informal coalition (referred to as the ''MP&M'' coalition) that coordinates regular meetings with representatives from the various affected industries. In the past year, EPA has also participated in several of the Small Business Administration's ''Small Business Roundtable'' meetings.

As discussed in detail in Section XXII.C, EPA conducted outreach and convened a Small Business Advocacy Review Panel. For this proposed rule, the small entity representatives included nine small MP&M facility owner/operators, one small municipality, and the following six trade associations representing different sectors of the industry: National Association of Metal Finishers (NAMF)/ Association of Electroplaters and Surface Finishers (AESF)/MP&M Coalition; the Association Connecting Electronics Industries (also known as IPC); Porcelain Enamel Institute; American Association of Shortline Railroads (ASLRA); Electronics Industry Association (EIA); and the American Wire Producers Association (AWPA).

Because many facilities affected by this proposal are indirect dischargers, the Agency also conducted outreach to publicly owned treatment works (POTWs) individually and through the Association of Municipal Sewerage Agencies (AMSA). EPA also conducted a survey of 150 POTWs to assess the burden associated with implementing the proposed MP&M rule (see Section V.B.5 above for discussion of the POTW survey). In addition, EPA made a concerted effort to consult with pretreatment coordinators and state and local entities that will be responsible for implementing this regulation.

EPA sponsored three stakeholders' meetings between November 1997 and May 2000. Two meetings were held in Washington, DC, and the third was held in Chicago, IL. The primary objectives of the meetings were to present the Agency's current thinking regarding the technology bases for the MP&M proposed rule and to solicit comments, issues, and new ideas from interested stakeholders, including members of environmental groups.

EPA provided information on the potential technology options and in-process pollution prevention practices as well as the potential subcategories. EPA also provided preliminary information on pollutant reductions, compliance costs, and potential monitoring flexibility.

Most recently, EPA has put up a website (http://www.epa.gov/ost/guide/mpm) to provide ongoing information on the MP&M project. The site includes background information, links to related documents, and information presented at MP&M stakeholders meetings.

VI. Industry Subcategorization

A. Methodology and Factors Considered for Basis of Subcategorization

EPA may divide a point source category (*e.g.,* MP&M) into groupings called ''subcategories'' to provide a method for addressing variations between products, raw materials, processes, and other factors which result in distinctly different effluent characteristics. Regulation of a category by using formal subcategories provides that each subcategory has a uniform set of effluent limitations which take into account technological achievability and economic impacts unique to that subcategory. In some cases, effluent limitations within a subcategory may be different based on consideration of the factors described in section 304(b)(2)(b) of the CWA, 33 U.S.C. 1314(b)(2)(B). The CWA requires EPA, in developing effluent limitations guidelines and pretreatment standards, to consider a number of different subcategorization factors. The statute also authorizes EPA to take into account other factors that the Agency deems appropriate. Stakeholders specifically suggested that EPA consider subcategories based on industry sector or type of activity within an industry sector (*e.g.,* repair and maintenance versus manufacturing), some of which appear to have very low baseline pollutant loadings.

EPA considered the following factors in its evaluation of potential MP&M subcategories:

- Unit operation;
- Activity;
- Raw materials;
- Products;
- Size of site;
- Location;
- Age;
- Nature of the waste generated;
- Economic impacts;
- Treatment costs;
- Total energy requirements;
- Air pollution control methods;
- Solid waste generation and disposal; and
- POTW burden.

One result of grouping similar facilities into subcategories is the increased likelihood that the regulations are practicable, and it diminishes the need to address variations between facilities through a variance process (Weyerhaeuser Co. V. Costle, 590 F.2d 1011, 1053 (D.C. Cir. 1978)).

EPA considered subcategorizing the MP&M category by industrial sector (*e.g.,* aerospace, aircraft, bus and truck, electronic equipment, hardware, household equipment, instruments, job shops, mobile industrial equipment, motor vehicles, office machines, ordnance, precious metals and jewelry, printed wiring boards, railroad, ships and boats, stationary industrial equipment, and miscellaneous metal products). Sectors are broadly defined and not only include manufacturing and repair facilities within the sector (*e.g.,* shipbuilding facilities in the ship and boat sector), but also include facilities that produce products that are used within the sector (*e.g.,* a facility that

manufactures hydraulic pumps used on ships is also in the ship and boat sector). The Agency determined that subcategorization based solely on industrial sector would require much more detailed subcategorization scheme than the approach proposed (see below). Adopting a subcategorization scheme based on industrial sector would complicate the implementation of the limitations and standards because permit writers might be required to develop facility-specific limitations across multiple subcategories.

The Agency determined that wastewater characteristics, unit operations, and raw materials used to produce products within a given sector are not always the same from site to site, and they are not always different from sector to sector. Within each sector, sites can perform a variety of unit operations on a variety of raw materials. For example, a site in the aerospace sector may primarily machine aluminum missile components and not perform any surface treatment other than alkaline cleaning. Another site in that sector may electroplate iron parts for missiles and perform little or no machining. Wastewater characteristics from these sites may differ because of the different unit operations performed and different raw materials used.

Based on the analytical data collected for this rule, EPA has not found a statistically significant difference in industrial wastewater discharge among industrial sectors when performing similar unit operations for cadmium, chromium, copper, cyanide, lead, manganese, molybdenum, nickel, oil & grease, silver, tin, TSS, and zinc. (The analytical data are available in the public record for this rulemaking.) For example, a facility that performs electroplating in the process of manufacturing office machines produces metal-bearing wastewater with similar chemical characteristics as a facility that performs electroplating in the process of manufacturing a part for a bus. Similarly, a facility that performs repair and maintenance on a airplane engine produces oil-bearing wastewater that has similar chemical characteristics to a facility that performs repair and maintenance on construction machinery.

Most MP&M unit operations are not unique to a particular sector and are performed across all sectors. For example, all sectors may perform several of the major wastewater-generating unit operations (*e.g.,* alkaline treatment, acid treatment, machining, electroplating). And, for the most part, the unit operations that are rarely performed (*e.g.,* abrasive jet machining) are not performed in all sectors, but are also not limited to a single sector. Therefore, a facility in any one of the 18 industrial sectors can generate metal-bearing or oil-bearing wastewater (or a combination of both) depending on what unit operations the facility performs.

In addition, two facilities that may be part of the same sector may generate wastewater with vastly different chemical characteristics and thus require different types of treatment. For example, an automobile manufacturer and an automobile repair facility are both part of the motor vehicle sector. However, the automobile manufacturer may perform unit operations that generate metal-bearing and oil-bearing wastewater (aqueous degreasing, electroplating, chemical conversion coating, etc.) while the automobile repair facility may perform unit operations that only generate oil-bearing wastewater (machining, aqueous degreasing, impact deformation, painting, etc.).

Due to the numerous MP&M facilities that could fall under the scope of multiple sectors, EPA determined that a regulation based on MP&M industrial sector would create a variety of implementation issues for State and local regulators as well as for those multiple-sector facilities. Therefore, as mentioned above, EPA is not proposing to use industrial sector to subcategorize the industry.

In the Phase I proposal, EPA did not subcategorize the Phase I segment of MP&M sectors (see 60 FR 28221; May 30, 1995). As discussed in Section II.C, the scope of the 1995 proposal differed from today's proposal in that it only covered seven of the 18 MP&M industrial sectors. For today's proposal, EPA performed the analysis for determining whether or not to subcategorize considering all facilities under the scope of today's rule (*i.e.,* both Phase I and II industrial sectors). See Section III for a discussion on the scope of today's proposal. Based on this analysis, EPA determined that it is necessary to subcategorize the MP&M industry.

A variety of factors influenced EPA's decision to subcategorize the MP&M industry. First, EPA found two basic types of wastestreams in the industry: (1) wastewater with high metals content (metal-bearing), and (2) wastewater with low concentration of metals, and high oil and grease content (oil-bearing). The type of wastewater a facility generates is directly related to the unit operations it performs. For example, unit operations such as machining, grinding, aqueous degreasing, and impact or pressure deformation tend to generate a wastewater with high oil and grease (and associated organic pollutants) loadings without significant concentrations of metal pollutants. While other unit operations such as electroplating, conversion coating, chemical etching and milling, and anodizing generate higher metals loadings with moderate/low oil and grease concentrations.

Although many facilities generate both metal- and oil-bearing wastewater, there are a large number of facilities that only generate oil-bearing wastewater. Such facilities are typically machine shops and maintenance and repair facilities. Since the wastewater at these facilities primarily contains oil and grease and other organic constituents, treatment technologies at these facilities focus on oil removal only and do not require the chemical precipitation step needed for treating metal-bearing wastewater. Treatment technologies in place at these facilities generally include ultrafiltration, or chemical emulsion breaking followed by either gravity floatation, coalescing plate oil/water separators, or dissolved air flotation (DAF). Therefore, EPA first divided the industry on the basis of unit operations performed and the nature of the wastewater generated, resulting in the following two groups: (1) metal-bearing with or without oily and organic constituents group; and (2) oil-bearing only group. As a second step, EPA performed an analysis to see if there were any significant differences in the subcategorization factors within the two basic groups.

When looking at facilities with metal-bearing wastewater (with or without oil-bearing wastewater), EPA identified several groups of facilities which could potentially be subcategorized by dominant product, raw materials used, and/or nature of the waste generated. In two subcategories, EPA also considered economic impacts as a factor in subcategorization because of the reduced ability of these facilities to afford treatment costs. There were also two subcategories where the number of facilities that were not currently covered by an existing effluent guidelines regulation was large enough to present an unacceptable burden to POTWs.

Based on the currently available data, EPA is proposing to subcategorize the metal-bearing (with or without oil-bearing wastewater) MP&M facilities into the following subcategories: non-chromium anodizing; metal finishing job shops; printed wiring board facilities; steel forming and finishing facilities; and general metals facilities. EPA describes its rationale for

subcategorization below (see Section VI.C for additional detailed discussion and applicability of each of these subcategories).

The non-chromium anodizers are different from other MP&M facilities in that all of their products are primarily of one metal type—anodized aluminum—and most importantly, they do not use chromic acid or dichromate sealants in their anodizing process. Based on EPA's limited data for these facilities, EPA expects that these facilities have very low levels of metals (with the exception of aluminum) or toxic organic pollutants in their wastewater discharges. EPA determined that other MP&M facilities had much greater concentrations of a wider variety of metals. In addition, due to the presence of large quantities of aluminum, these facilities require much larger wastewater treatment systems to remove the large amounts of aluminum and low levels of alloy metals. The need for larger treatment systems results in higher costs and large economic impacts for this potential subcategory. EPA found that as many as 60 percent of the non-chromium anodizers could experience closures as a result of complying with the proposed regulation (see Section XVI for a discussion of economic impacts). Therefore, based on the difference in raw materials used, product produced, nature of the waste generated (*i.e.,* low levels of pollutants discharged), treatment costs, and projected economic impacts, EPA concluded that a basis exists for subcategorizing the non-chromium anodizing facilities in the MP&M industry.

EPA investigated whether or not to subcategorize the metal finishing and electroplating job shops covered by the Metal Finishing (40 CFR part 433) and Electroplating (40 CFR part 413) effluent guidelines. Although the facilities have metal types that require the same treatment technologies as many other metals-bearing facilities, EPA determined these facilities to be different due to the variability of their raw materials and products as well as the slightly higher level of economic impacts incurred as compared to other costed facilities. As discussed in Section VI.C.2 below, this subcategory includes only those facilities who perform the six operations defining the applicability of the Metal Finishing and Electroplating effluent guidelines and who are ''job shops'' by the definition provided in the Metal Finishing effluent guidelines (*i.e.,* they own less than 50 percent of the products processed on site on an annual area basis). (See 40 CFR 433.11). Because these facilities are job shops and perform work on a contract basis, they cannot always predict the type of plating or other finishing operations required. In addition, because these facilities perform work on a large variety of metal types from various customers, the wastewater generated at these facilities can vary from week to week (or even day to day). EPA performed wastewater sampling to specifically identify the variability in the wastewater generated at metal finishing job shops and found that the variability factors calculated solely on the analytical wastewater sampling data of metal finishing and electroplating job shops is higher for most pollutant parameters than those calculated for similar metal-bearing subcategories (*e.g.,* General Metals) (see Section II.D for a discussion of EPA's job shop variability wastewater sampling and Section VIII.B for a discussion on determining limits and variability factors). In addition, EPA found that up to 10 percent of the indirect discharging metal finishing job shops subcategory could experience facility closures as a result of compliance with the proposed regulatory technology option (see Section VIII for a discussion of technology options). Therefore, EPA concluded that it has an appropriate basis for subcategorizing metal finishing and electroplating job shops.

EPA determined that there is a basis for establishing a different subcategory for the printed wiring board facilities from the other facilities in the group of metal-bearing (with or without oil-bearing wastewater) facilities based on raw materials, unit operations performed, dominant product, and nature of the waste generated. First, these facilities process a more consistent mix of metal types (primarily copper, tin, and lead) than other MP&M facilities to produce a specific product. EPA has concluded that this more consistent mix of metal types enables the printed wiring board facilities to tailor their treatment technology and incorporate more of the advanced pollution prevention and recovery technologies (*e.g.,* ion exchange). Printed wiring board facilities generally work with copper-clad laminate material, allowing them to target copper for removal in their wastewater treatment systems or recover the copper using in-process ion exchange. Second, these facilities apply, develop, and strip photoresist—a set of unit operations which is largely unique to this proposed subcategory. This process results in a higher concentration of a more consistent group of organic constituents than other facilities in the metal-bearing group. Finally, the nature of the wastewater generated at these facilities may also be different due to the fact that these facilities perform more lead-bearing operations (*e.g.,* lead/tin electroplating, wave soldering) than other MP&M facilities.

Steel forming and finishing is another proposed subcategory under the metal bearing (with or without oil-bearing wastewater) group of MP&M facilities. These facilities perform both cold forming and finishing operations on steel at stand-alone facilities as well as at steel manufacturing facilities. EPA formerly covered these facilities under the 1982 Iron and Steel Manufacturing effluent guidelines (40 CFR part 420). Typical operations include: acid pickling, annealing, conversion coating (*e.g.,* zinc phosphate, copper sulfate), hot dip coating and/or electroplating of steel wire or rod, heat treatment, welding, drawing, patenting, and oil tempering. EPA concluded that the basis for subcategorization is the difference in the raw material and dominant product at these facilities. Facilities in this subcategory only process steel and for the most part produce uniformly-shaped products such as wire, rod, bar, pipe and tube. In addition, this is the only subcategory where EPA is proposing to cover forming operations under the MP&M regulations. Effluent guidelines specific to forming operations exist for all other common metal types (*e.g.,* Aluminum Forming (40 CFR part 467); Copper Forming (40 CFR part 468); and Nonferrous Metals Forming & Metal Powders (40 CFR part 471)).

Finally, after subcategorization of the non-chromium anodizing, metal finishing job shops, printed wiring board facilities, steel forming and finishing facilities, EPA is proposing to group the remaining metal-bearing (with or without oil-bearing wastewater) group of MP&M facilities into a subcategory entitled ''General Metals.'' This subcategory would be a ''catch-all'' for facilities that did not fall into any of the previous subcategories but whose wastewater, at a minimum, requires metals removal and may also require the preliminary treatment steps of oil/water separation, chromium reduction, and cyanide destruction. For example, wastewater generated from most manufacturing operations and heavy rebuilding operations (*e.g.,* aircraft/aerospace, automobile, bus/truck, railroad) would be regulated under the proposed General Metals subcategory.

When looking at facilities with only oil-bearing wastewater for potential further subcategorization, EPA found that there were two types of facilities that were different from the other

facilities in that group based on size, location, and dominant product/activity. The first type of facility includes MP&M operations that occur in shipbuilding dry docks or similar structures, and the second includes railroad line maintenance facilities (see VI.C.8 and VI.C.9, respectively, for a detailed description of these proposed subcategories). Dry docks (and similar structures such as graving docks, building ways, lift barges, and marine railways) are large, outdoor areas exposed to precipitation that shipyards use to perform final assembly, maintenance, rebuilding and repair work on large ships and boats. Due to their size, outdoor location, low level of pollutant loadings discharged to the environment, and the fact this wastewater is unique to the shipbuilding industry, EPA believes that a basis exists to subcategorize shipbuilding dry docks and similar structures. This proposed subcategory does not include other MP&M operations that occur at shipyards (*e.g.,* shore-side operations).

Similarly, railroad line maintenance facilities are outdoor facilities where light maintenance and cleaning of railroad cars, engines and car-wheel trucks occur. Due to their outdoor location, unit operations performed, and low level of pollutant loadings discharged to the environment, EPA concluded that there is a basis to subcategorize railroad line maintenance facilities. EPA notes that this proposed subcategory does not include railroad manufacturing operations or railroad overhaul/rebuilding facilities.

Finally, after subcategorization of the shipbuilding dry dock and railroad line maintenance facilities, EPA is proposing to group the remaining oily-bearing wastewater group of MP&M facilities into a subcategory entitled ''Oily Wastes.'' This subcategory would be a ''catch-all'' for facilities that did not fall into the two above ''oily'' subcategories but whose wastewater does not have metals loadings at levels where they can be effectively treated. Following further analysis, EPA has decided not to propose pretreatment standards for indirect discharging facilities in the shipbuilding dry dock and railroad line maintenance subcategories (see Section XII for a discussion pertaining to pretreatment standards).

B. Proposed Subcategories

As discussed above in Section VI.A, EPA has determined that a basis exists for dividing the MP&M category into the following subcategories for the proposed rule: General Metals, Non-Chromium Anodizing, Metal Finishing Job Shops, Printed Wiring Boards, Steel Forming and Finishing, Oily Wastes, Railroad Line Maintenance, and Shipbuilding Dry Dock. In Section VI.C below, EPA describes each subcategory and defines the applicability of the rule for facilities in each subcategory. EPA notes that with the exception of the two general subcategories (General Metals and Oily Wastes), the remaining proposed subcategories would not have been relevant to the subcategorization of the Phase I MP&M proposal. The facilities that have been further subcategorized in today's proposal were all part of the Phase II MP&M sectors (see Section II.C for a discussion on the 1995 Phase I proposal).

EPA believes its proposed subcategories make sense, for the reasons discussed above, but requests comment on other possible subcategories. In particular, it has been suggested that the large General Metals subcategory be further subdivided into industrial sectors based on preliminary analyses which suggest that discharges from some sectors may be low enough to warrant exclusion from this regulation. Some of the wastewaters in these sectors may be covered by other effluent guidelines. EPA requests comment on further subdivision of the General Metals subcategory. Commenters should include data to support their suggestions where possible.

C. General Description of Facilities in Each Subcategory

1. General Metals

As discussed above in Section VI.A, EPA has created the General Metals subcategory as a ''catch-all'' for MP&M facilities that discharge metal-bearing wastewater (with or without oil-bearing wastewater) that do not fit the applicability of the Printed Wiring Board, Non-Chromium Anodizing, Metal Finishing Job Shops, or Steel Forming and Finishing subcategories. Therefore, the General Metals subcategory may include facilities from 17 of the 18 MP&M industrial sectors (*i.e.,* all except the printed wiring board sector). This subcategory also includes General Metals facilities that are owned and operated by states and municipalities. (See Section III for a discussion on the general scope of today's proposal). General Metals facilities likely perform manufacturing or heavy rebuilding of metal products, parts, or machines. Facilities that perform metal finishing or electroplating operations on-site, but do not meet the definition of a job shop (*i.e.,* captive shops), would fit in the applicability of the General Metals subcategory.

EPA estimates that there are approximately 26,000 indirect dischargers and 3,800 direct dischargers that could be covered by this proposed subcategory. EPA currently regulates 26 percent of the facilities in this subcategory by existing effluent guidelines. Based on responses to its questionnaires, the Agency estimates that the Metal Finishing (40 CFR part 433) and Electroplating (40 CFR part 413) effluent guidelines cover approximately 16 percent of these facilities and other metals related effluent guidelines (such as those discussed in Section II.B.) cover a portion of the wastewater discharges at an additional 10 percent of these facilities.

EPA is proposing to exclude, from the MP&M regulations, indirect discharging facilities that would fall into the General Metals subcategory when they discharge less than or equal to 1 million gallons per year (MGY) of MP&M process wastewater to the POTW. (See Sections II.D, III, and XII for discussions on the proposed low flow cutoff and its impact on POTW burden reduction). In cases where these General Metals facilities discharge less than or equal to 1 MGY to a POTW, these pretreatment standards proposed today do not apply; however, facilities are still subject to other applicable pretreatment standards, including those established under parts 413 and 433. See Sections IX, XI, and XII of this preamble for information on compliance costs, pollutant reductions, and economic impacts associated with the MP&M rule for the General Metals subcategory.

2. Metal Finishing Job Shops

Facilities in the Metal Finishing Job Shops subcategory must meet the following criteria: (1) Discharge wastewater from one or more of the six operations identified in the applicability of the Metal Finishing (40 CFR part 433) and Electroplating (40 CFR part 413) effluent limitations guidelines regulations; and (2) must meet the definition of a job shop. The six identifying operations are: Electroplating, Electroless Plating, Anodizing, Coating (chromating, phosphating, passivation, and coloring), Chemical Etching and Milling, and Printed Circuit Board Manufacture (*i.e,* Printed Wiring Boards). As in the Metal Finishing effluent guidelines (40 CFR part 433), EPA defines a ''job shop'' as ''a facility which owns not more than 50 percent (on an annual area basis) of the materials undergoing metal finishing.'' EPA is proposing to include printed

wiring board job shops in this subcategory based on the unique economics of job shop operation. However, EPA solicits comment on the variability of the raw materials, products, and wastewater at printed wiring board job shops. EPA also solicits comment on including printed wiring board job shops under this subcategory or whether EPA should include them in the Printed Wiring Board Subcategory (see Section VI.C.4 for a discussion on the Printed Wiring Board Subcategory).

The Agency estimates that there are approximately 1,500 indirect dischargers and 15 direct dischargers in the proposed Metal Finishing Job Shops subcategory. EPA currently regulates all facilities in this subcategory by the existing Metal Finishing or Electroplating effluent guidelines and standards. EPA is proposing to cover all of these facilities under this proposed rule. Therefore, under today's proposal, facilities subject to the Metal Finishing Job Shops subcategory would no longer be covered by the effluent limitations guidelines and standards in 40 CFR part 413 or 40 CFR part 433. (See § 438.20(a)). EPA estimates that today's proposal could reduce pollutant loadings from this subcategory by an additional 1.75 million toxic pound equivalents [2] annually over the reductions currently achieved.

EPA has identified approximately 30,000 facilities that meet the definition of job shop but do not discharge wastewater from one or more of the six identifying metal finishing operations as defined in 40 CFR part 433. EPA does not consider such job shops to be part of the Metal Finishing Job Shops subcategory. For example, these other job shops perform assembly, painting, and machining on a contract basis and are likely to fall in the General Metals or Oily Waste subcategories.

EPA is considering an alternative compliance option for this subcategory which includes the demonstration of specified pollution prevention practices for all facilities in the subcategory (or possibly only those facilities below a specified flow cutoff). See Section XXI.D for a discussion on the pollution prevention alternative for Metal Finishing Job Shops. Also see Sections IX, XI, and XII of this preamble for information on compliance costs, pollutant reductions, and economic impacts for the Metal Finishing Job Shops subcategory.

3. Non-Chromium Anodizing

Facilities covered under the proposed Non-Chromium Anodizing subcategory must perform aluminum anodizing without the use of chromic acid or dichromate sealants in their MP&M operations. Anodizing is a surface conversion operation used to alter the properties of aluminum for better corrosion resistence and heat transfer. Generally, non-chromium anodizing facilities perform sulfuric acid anodizing; however, facilities can use other acids, such as oxalic acid, for aluminum anodizing. EPA is not including anodizers that use chromic acid or dichromate sealants under this subcategory. EPA is proposing to cover those facilities in the General Metals subcategory or the Metal Finishing Job Shops subcategory (if they operate as a job shop). EPA solicits comment on the chromium content of sulfuric acid anodizing baths, anodizing dyes/sealants, and other wastewater from sulfuric acid anodizing.

EPA estimates that there are approximately 190 indirect dischargers and, to date, has not identified any direct dischargers in the Non-Chromium Anodizing subcategory. The wastewater generated at non-chromium anodizing facilities contains very low levels of metals (with the exception of aluminum) and toxic organic pollutants. In addition, as discussed in Section VI.A, above, EPA determined that compliance with the proposed regulation would cause 60 percent of the indirect discharging facilities in this subcategory to close. Therefore, for the reasons discussed in Section XII.F below, EPA is proposing to exclude wastewater from indirect discharging non-chromium anodizing facilities (that also do not use dichromate sealants) from the MP&M categorical pretreatment standards. Such facilities would still need to comply with the pretreatment standards of the Metal Finishing (40 CFR part 433) or Electroplating (40 CFR part 413) effluent guidelines for their non-chromium anodizing wastewater and the general pretreatment standards at 40 CFR part 403. EPA is proposing limits for direct dischargers in this subcategory. EPA solicits comment on whether the applicable standards for indirect discharging non-chromium anodizers should be transferred from 40 CFR part 433 to the MP&M regulation in order to include all non-chromium anodizers under one regulation. Because today's proposal includes a monitoring waiver for pollutants that are not present (see Section XXI.C.1 for a discussion on the monitoring waiver), the Agency believes that transferring the pretreatment standards for these facilities to the MP&M regulation would allow non-chromium anodizing indirect dischargers to reduce the number of parameters for which they have to monitor. See Section IX, XI, and XII of this preamble for information on compliance costs, pollutant reductions, and economic impacts for the Non-Chromium Anodizing subcategory.

Some facilities that could potentially fall into the Non-Chromium Anodizing subcategory may also perform other metal surface finishing operations at their facilities. If these facilities commingle their wastewater from their non-chromium anodizing operations with wastewater from other surface finishing operations (*e.g.,* chromic acid anodizing, electroplating, chemical conversion coating, etc.) for treatment, they would not be covered by the Non-Chromium Anodizing subcategory. Instead, the General Metals or Metal Finishing Job Shop subcategories would apply. However, for facilities that discharge their non-chromium anodizing wastewater separate from their other surface finishing wastewater, control authorities and permit writers would apply the appropriate limits to each discharge.

4. Printed Wiring Board

EPA is proposing the Printed Wiring Board subcategory to cover wastewater discharges from the manufacture, maintenance, and repair of printed wiring boards (*i.e.,* circuit boards). This subcategory does not include job shops that manufacture, maintain or repair printed wiring boards—EPA is covering these facilities under the Metal Finishing Job Shops subcategory, see Section VI.C.2 above for a discussion. EPA currently regulates all facilities in this subcategory by the existing Metal Finishing or Electroplating effluent guidelines and standards. EPA is proposing to cover all of these facilities under this proposed rule. Therefore, under today's proposal, facilities subject to the Printed Wiring Board subcategory would no longer be covered by the effluent limitations guidelines and standards in 40 CFR part 413 or 40 CFR part 433. Printed wiring board facilities perform unique operations including applying, developing and stripping of photoresist, lead/tin soldering, and wave soldering. EPA estimates that there are approximately 620 indirect

[2] EPA uses toxic pound-equivalents to indicate the amount of toxicity that a pollutant may exert on human health and aquatic life. The Agency calculates toxic pound-equivalents by multiplying the mass of pollutants discharged (or removed) by that pollutant's toxic weighting factor (TWF). EPA develops TWFs using a combination of toxicity data on human health and aquatic life and are relative to the toxicity of copper. (See Section XVII of today's notice or the Cost-Effectiveness Analysis Document for this proposed rule for a more detailed discussion of toxic weighting factors).

dischargers and 11 direct dischargers in the proposed Printed Wiring Board subcategory. See Sections IX, XI, XII, and XVI of this preamble for information on compliance costs, pollutant reductions, and economic impacts for the Printed Wiring Board subcategory.

5. Steel Forming & Finishing

Although many facilities may perform MP&M operations with steel, EPA is proposing to establish the Steel Forming & Finishing subcategory for process wastewater discharges from facilities that perform MP&M operations (listed in Section III) or cold forming operations on steel wire, rod, bar, pipe, or tube. This subcategory does not include facilities that perform those operations on base materials other than steel. In a separate notice, EPA is proposing to revise the Iron and Steel Manufacturing effluent guidelines. The proposed revisions to the Iron and Steel regulations include revising the applicability to exclude those facilities that EPA has determined to be appropriately regulated by the MP&M proposed rule. EPA based this decision on the information gathered during the data collection effort for the proposed revision to the Iron & Steel Manufacturing regulations.

The MP&M Steel Forming & Finishing proposed subcategory does not cover wastewater generated from performing any hot steel forming operations; or wastewater from cold forming, electroplating or continuous hot dip coating of steel sheet, strip, or plates. As mentioned above, the new proposed Iron & Steel Manufacturing effluent guidelines cover wastewater from such operations.

EPA estimates that there are approximately 110 indirect dischargers and 43 direct dischargers in the Steel Forming & Finishing subcategory of the proposed MP&M regulation. All facilities in this subcategory have permits or other control mechanisms under the existing Iron and Steel Manufacturing regulation (40 CFR part 420).

EPA is proposing to cover wastewater from these steel forming and finishing operations, regardless of whether they occur at a stand-alone facility or at a steel manufacturing facility. When a steel manufacturing facility performs these MP&M steel forming and finishing operations and commingles the wastewater for treatment with wastewater from other non-MP&M unit operations, control authorities (*e.g.,* POTWs) and permit writers will need to set limits which account for both the MP&M and the Iron & Steel regulations. As mentioned previously, EPA refers to this approach as the combined waste stream formula or the building block approach. For facilities that choose to discharge their MP&M Steel Forming & Finishing wastewater separate from their Iron & Steel wastewater, control authorities and permit writers will apply the appropriate limits to each discharge. See Sections IX, XI, and XII of this preamble for information on compliance costs, pollutant reductions, and economic impacts for the Steel Forming & Finishing subcategory.

6. Oily Wastes

EPA has created the Oily Wastes subcategory as a ''catch-all'' for MP&M facilities that discharge only oil-bearing wastewater and that do not fit the applicability of the other MP&M subcategories. EPA is defining the applicability of this subcategory by the presence of specific unit operations. Facilities in the Oily Wastes subcategory must not fit the applicability of the Railroad Line Maintenance or Shipbuilding Dry Dock subcategories and must only discharge wastewater from one or more of the following MP&M unit operations: alkaline cleaning for oil removal, aqueous degreasing, corrosion preventive coating, floor cleaning, grinding, heat treating, impact deformation, machining, pressure deformation, solvent degreasing, testing (*e.g.,* hydrostatic, dye penetrant, ultrasonic, magnetic flux), painting, steam cleaning, and laundering. EPA is defining ''corrosion preventive coating'' to mean the application of removable oily or organic solutions to protect metal surfaces against corrosive environments. Corrosion preventive coatings include, but are not limited to: petrolatum compounds, oils, hard dry-film compounds, solvent-cutback petroleum-based compounds, emulsions, water-displacing polar compounds, and fingerprint removers and neutralizers. Corrosion preventive coating does not include electroplating, painting, chemical conversion coating (including phosphate conversion coating) operations. EPA is soliciting comment on the differences in metals content of wastewater generated from ''light'' phosphoric acid operations (such as some phosphoric acid etching operations and cleaning operations using phosphoric acid solutions) and from phosphate conversion coating. EPA is considering including phosphoric acid etching and cleaning using phosphoric acid solutions in the definition of ''oily operations'' discussed above. However, the Agency is not considering the inclusion of phosphate conversion coating as one of the ''oily operations.'' Based on EPA's database for this proposal, EPA believes that wastewater generated from phosphate conversion coating operations contains high levels of zinc and manganese.

If a facility discharges wastewater from any of the above listed operations but also discharges wastewater from other MP&M operations, it does not meet the criteria of the Oily Wastes subcategory. Facilities in this subcategory are predominantly machine shops or maintenance and repair shops. EPA has determined that other MP&M unit operations generate metal-bearing wastewater or combination metal- and oil-bearing wastewater and require different treatment technology (*i.e.,* chemical precipitation). EPA included wastewater from floor cleaning and testing operations based on review of the analytical data that confirmed little or no metals content in these two streams. This subcategory also includes state- and municipally-owned facilities only performing the listed operations.

Like the General Metals subcategory, the Oily Wastes subcategory may include a number of facilities from each of 17 of the 18 MP&M industrial sectors (*i.e.,* all except the printed wiring board sector). (See Section III for a discussion on the general scope of today's proposal).

EPA estimates that there are approximately 28,500 indirect dischargers and 900 direct dischargers in the Oily Wastes subcategory. EPA has concluded that less than 1 percent of the MP&M process wastewater discharged from facilities in this subcategory are covered by an existing effluent guideline.

For the reasons stated in Section XII, EPA is proposing to exclude from the MP&M regulations indirect discharging facilities that would fall into the Oily Wastes subcategory when they discharge less than or equal to 2 MGY of MP&M process wastewater to the POTW. EPA is also seriously considering a higher flow cutoff of 3 MGY for these indirect dischargers. See Sections IX, XI, XII of this preamble for information on compliance costs, pollutant reductions, and economic impacts for the Oily Wastes subcategory.

7. Railroad Line Maintenance

EPA has developed the Railroad Line Maintenance subcategory to cover facilities that perform routine cleaning and light maintenance on railroad engines, cars, and car-wheel trucks and similar parts or machines. More specifically these facilities only discharge wastewater from MP&M unit

operations that EPA defines as oily operations (see Section VI.C.6, above) and/or washing of final product. For other primarily oily subcategories (oily wastes and shipbuilding dry docks), EPA does not consider the unit operation ''washing of final product'' an MP&M ''oily'' operation; however, EPA has reviewed the analytical wastewater sampling data for this wastestream at railroad line maintenance facilities and determined that there is little or no metal content. This subcategory does not include railroad manufacturing facilities or railroad overhaul or heavy maintenance facilities. Railroad line maintenance facilities are similar to facilities in the Oily Wastes subcategory in that they produce oil-bearing wastewater and do not perform MP&M operations that generate wastewater that require metals removal treatment technology.

EPA estimates that there are approximately 800 indirect dischargers and 35 direct dischargers in the Railroad Line Maintenance subcategories. The wastewater generated at railroad line maintenance facilities contains very low levels of metals and toxic organic pollutants. For the reasons discussed in Section XII, EPA is proposing to exclude wastewater from indirect discharging railroad line maintenance facilities from the MP&M regulations. However, EPA is proposing to regulate conventional pollutants for direct dischargers in this subcategory. See Sections IX, XI, and XII of this preamble for information on compliance costs, pollutant reductions, and economic impacts for the Railroad Line Maintenance subcategory.

8. Shipbuilding Dry Dock

EPA has created the Shipbuilding Dry Dock subcategory to specifically cover MP&M process wastewater generated in or on dry docks and similar structures such as graving docks, building ways, marine railways and lift barges at shipbuilding facilities (or shipyards). Shipbuilding facilities use these structures to perform maintenance, repair or rebuilding of existing ships, or the final assembly and launching of new ships (including barges). Shipbuilders use these structures to reach surfaces and parts that would otherwise be under water. Since dry docks and similar structures include sumps or containment systems, they also enable shipyards to control the discharge of pollutants to the surface water. Typical MP&M operations that occur in dry docks and similar structures include: abrasive blasting, hydroblasting, painting, welding, corrosion preventive coating, floor cleaning, aqueous degreasing, and testing (*e.g.,* hydrostatic testing). Not all of these unit operations generate wastewater. EPA is also proposing to cover wastewater generated when a shipyard cleans a ship's hull in a dry dock (or similar structure) for removal of marine life (*e.g.,* barnacles) only when in preparation for performing MP&M operations. EPA discusses typical MP&M unit operations in Section III.

EPA is proposing that this subcategory only cover wastewater generated from MP&M operations that occur in or on these structures. The Agency is not including MP&M process wastewater that is generated at other locations at the shipyard (''on-shore'' operations) in this proposed subcategory. EPA expects that wastewater from these ''on-shore'' shipbuilding operations (*e.g.,* electroplating, plasma arc cutting) will fall under either the General Metals or Oily Wastes subcategories of the proposed MP&M regulation. Also, EPA is not including wastewater generated on-board ships when they are afloat (*i.e.,* not in dry docks or similar structures). For U.S. military ships, EPA is in the process of establishing standards to regulate discharges of wastewater generated on-board these ships when they are in U.S. waters and are afloat under the Uniform National Discharge Standards (UNDS) pursuant to section 312(n) of the CWA. (See 64 FR 25125, May 10, 1999). However, when ships are located in dry docks or similar structures, EPA is proposing to cover process wastewater generated and discharged from MP&M operations inside and outside the vessel (including bilge water).

EPA identified three other types of water streams in or on dry docks and similar structures: flooding water, dry dock ballast water, and storm water. Flooding water enters and exits the dry dock or similar structure prior to performing any MP&M operations. For example, in a graving dock, the gates are opened allowing flooding water in and ships to float inside the chamber. Then the flooding water is drained, leaving the ship's exterior exposed so shipyard employees can perform repair and maintenance on the ship's hull. Dry dock ballast water serves a similar purpose. It is used to lower (or sink) the dry dock so that a ship can float over it. Then the dry dock ballast water is pumped out, raising the dry dock with the ship on top. Finally, since these structures are located outdoors and are exposed to the elements, storm water may fall in or on the dry dock or similar structures. EPA is proposing to exclude all three of these water streams from the MP&M regulation. Flooding water and dry dock ballast water do not come into contact with MP&M operations. In addition, EPA has determined that storm water at these facilities is covered by EPA's recent Storm Water Multi-Sector General permit, similar general permits issued by authorized states, and individual storm water permits. In general, storm water permits at shipyards include best management practices (BMPs) that are designed to prevent the contamination of storm water. For example, these practices include sweeping of areas after completion of abrasive blasting or painting. If EPA were to cover storm water in dry docks (or similar structures) under today's proposed rule, it would be unlikely that EPA would set numerical limits similar to those it is proposing for process wastewater. Most likely, EPA would set BMPs similar to those currently used in the storm water permits. Therefore, in an effort to avoid duplication of coverage, EPA is not covering storm water in dry docks (or similar structures) under today's proposal.

EPA estimates that there are 6 indirect dischargers and 6 direct dischargers in the Shipbuilding Dry Dock subcategory. The Agency notes that many shipbuilders operate multiple dry docks (or similar structures) and that this is the number of estimated facilities (not dry docks) that discharge MP&M process wastewater from dry docks (and similar structures). Many shipyards only perform dry MP&M unit operations in their dry docks (and similar structures) or do not discharge wastewater generated in dry docks (and similar structures) from MP&M unit operations. Many shipyards prefer to handle this wastewater as hazardous, and contract haul it off-site due to the possible presence of copper (used as anti-foulant) in paint chips from abrasive blasting operations. EPA has determined that shipyards currently discharging MP&M wastewater from dry docks have oil/water separation technology in place, such as dissolved air flotation (DAF).

The wastewater discharged from dry docks and similar structures contains very low levels of metals and toxic organic pollutants. For the reasons discussed in Section XII, EPA is proposing to exclude wastewater from indirect discharging dry docks and similar structures at shipbuilding facilities from the MP&M regulations. However, EPA is proposing to regulate conventional pollutants for direct dischargers in this subcategory. See Sections IX, XI, and XIII of this preamble for information on compliance costs, pollutant reductions, and

economic impacts for the Shipbuilding Dry Dock subcategory.

VII. Water Use and Wastewater Characteristics

A. Wastewater Sources and Characteristics

EPA classified the MP&M unit operations into the following three groups depending on their water use and discharge: (1) Unit operations that typically use process water and discharge process wastewater; (2) unit operations that typically either do not use process water or use process water but do not discharge wastewater; and (3) miscellaneous operations reported in the MP&M questionnaires by fewer than five respondents.

Process wastewater includes any water that, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw materials, intermediate products, finished products, by-products, or waste products. Process wastewater includes wastewater from wet air pollution control devices. For the purposes of the MP&M regulation, EPA does not consider non-contact cooling water or storm water a process wastewater nor does it consider non-aqueous wastes used as processing liquids, such as spent solvents or quench oil, as process wastewater. (See Section III for detailed discussion on general applicability of today's proposed rule).

Wastewater from the operations that use process water have different characteristics depending on the unit operation from which they are derived. EPA discusses the five different types of MP&M process wastewater below. First, oil-bearing wastewater is typically generated from the use of metal shaping coolants and lubricants, surface preparation solutions used to remove oil and dirt from components, and associated rinses. Some examples of oil-bearing wastewater are: Machining and grinding coolants and lubricants; pressure and impact deformation lubricants; dye penetrant and magnetic flux testing; and alkaline cleaning solutions and rinses used to remove oil and dirt. This wastewater typically requires preliminary treatment to remove oil and grease. The most common type of treatment for oil-bearing wastewater is chemical emulsion breaking followed by gravity separation and oil skimming. EPA also identified MP&M facilities that used membrane separation technologies for oil and grease removal.

Second, hexavalent chromium-bearing wastewater typically consists of concentrated surface preparation or metal deposition solutions, sealants, and associated rinses. Some examples of hexavalent chromium-bearing wastewater are: Chromic acid treatment solutions and rinses; chromate conversion coating solutions and rinses; and chromium electroplating solutions and rinses. This wastewater typically requires preliminary treatment to reduce the hexavalent chromium to trivalent chromium for subsequent chemical precipitation and settling. Typically, MP&M facilities use sodium metabisulfite or gaseous sulphur dioxide as reducing agents in the reduction of hexavalent chromium-bearing wastewater.

Third, many surface preparation or metal deposition solutions and their associated rinses generate process wastewater that contains cyanide. Two examples of cyanide-bearing wastewater are: Cyanide-bearing alkaline treatment solutions and rinses (typically used as a surface treatment step prior to electroplating with cyanide solutions) and cyanide-bearing electroplating solutions and rinses. This wastewater typically requires preliminary treatment to destroy cyanide and facilitate subsequent chemical precipitation and settling. MP&M facilities most often use sodium hypochlorite for the destruction of cyanide by alkaline chlorination.

Fourth, concentrated surface preparation or metal deposition solutions and their associated rinses can generate process wastewater that contain complexed or chelated metals. In particular, electroless plating operations and their rinses typically produce this type of wastestream. This wastewater requires preliminary treatment to break and/or precipitate the complexes for subsequent chemical precipitation and settling. MP&M facilities typically use sodium borohydride, hydrazine, sodium hydrosulfite, or sodium dimethyldithiocarbamate (DTC) as reducing and precipitating agents in this preliminary treatment process.

For the MP&M proposal, EPA based the estimated costs and pollutant removals associated with the treatment of chelated or complexed metals on the use of DTC. When DTC is used appropriately, it may effectively enhance the removal of some difficult to treat pollutants without impacting the environment or POTW operations. However, DTC is toxic to aquatic life and to activated sludge and thus can upset POTW operations. DTC can combine to form, or break down to, a number of other toxic chemicals, including thiram and ziram (both EPA registered fungicides) and other thiurams, other dithiocarbamates, carbon disulfide, and dimethylamine. EPA's pollutant of concern list (see below for a description of the development of this list) contained ziram, carbon disulfide, and N-nitrosodimethylamine. Ziram is known to be toxic to aquatic life at the following levels: LC50 less than 10 ug/L (parts per billion) for several varieties of bluegill and trout; LC 50 between 10 and 100 ug/L in other studies (AQUIRE data base at *http://www.epa.gov/medecotx/quicksearch.htm*.) EPA solicits comment on the use of DTC for the treatment of chelated wastewater and its potential harmful effects on the environment and on POTW operations. The Agency is particularly interested in receiving data and information on alternative treatments for wastewater containing chelated or complexed metals.

Finally, virtually all MP&M process wastewater contains some metallic pollutants. Metal shaping solutions, surface preparation solutions, metal deposition solutions, and surface finishing solutions typically produce the most concentrated metal-bearing wastewater. MP&M facilities most commonly use chemical precipitation (usually with either lime or sodium hydroxide) and settling for metals removal. Many facilities also use coagulants and flocculants to assist chemical precipitation and settling.

As discussed in Section V.C, EPA conducted wastewater sampling episodes at 71 MP&M facilities to obtain data on the characteristics of MP&M wastewater and solid wastes, and to assess the following: the loading of pollutants to surface waters and POTWs from MP&M sites; the effectiveness of technologies designed to reduce and remove pollutants from MP&M wastewater; and the variation of MP&M wastewater characteristics across unit operations, metal types processed in each unit operation, and sectors. Although EPA analyzed the wastewater from these facilities for approximately 324 pollutant parameters (including conventional, nonconventional, and priority pollutants), it did not consider all of these pollutants for potential regulation. Rather, EPA reduced the list to 132 pollutants (referred to as pollutants of concern or POCs) for further consideration by retaining only those pollutants that met the following criteria:

- EPA detected the pollutant parameter in at least three samples collected during the MP&M sampling program.
- The average concentration of the pollutant parameter in samples of

wastewater from MP&M unit operations and influents-to-treatment was at least five times the minimum level (ML) or the average concentration of effluent-from-treatment wastewater samples exceeded five times the minimum level. EPA defines the ML as ''the lowest level at which the entire analytical system must give a recognizable signal and an acceptable calibration point for the analyte.'' (Development Document for Final Effluent Limitations Guidelines and Standards for the Centralized Waste Treatment Industry. U.S. EPA).

• EPA analyzed the pollutant parameter in a quantitative manner following the appropriate quality assurance/quality control (QA/QC) procedures. To meet this criteria, the Agency excluded wastewater analyses performed solely for certain semi-quantitative ''screening'' purposes. EPA performed these semi-quantitative analyses only in unusual cases (*e.g.* to qualitatively screen for the presence of a rare metal such as osmium).

From the list of 132 pollutants that passed the editing criteria above, EPA selected the regulated pollutants for each subcategory. See Section 7 of the technical development document for more information on the selection of pollutants to regulate. The Agency also used the pollutant parameters on the POC list to calculate the pollutant removals for each technology option.

B. Pollution Prevention, Recycle, Reuse and Water Conservation Practices

The data gathered to support this rule indicate that a number of pollution prevention and water conservation practices exist in the MP&M industry. EPA determined that some of these pollution prevention, recycling, and water conservation practices were broadly applicable to the MP&M category and included these in the technology options (see Section VIII.A).

A large number of additional pollution prevention practices were site specific and could not be used as the basis for a national standard. However, EPA considers it important to make this site-specific pollution prevention information available for possible use by MP&M sites. Therefore, the Technical Development Document (TDD) contains a summary of the pollution prevention practices identified during the development of this rule. EPA also collected data on water use and wastewater generation at facilities employing pollution prevention and good water use practices. The TDD contains this data and discusses the applicability of the more prevalent pollution practices identified in this category (*e.g.,* drag-out reduction, flow reduction, coolant and paint curtain recycling). EPA is soliciting comment and data on any of the pollution prevention, recycle, reuse and water conservation practices that it discusses in the TDD as well as additional information about these types of technologies that EPA did not discuss in the TDD. In addition, EPA is requesting data and comment on its flow data from facilities with pollution prevention and good water use practices in place. See Section XXI.D for a discussion on a pollution prevention alternative that EPA is considering for facilities in the Metal Finishing Job Shops subcategory.

VIII. Development of Effluent Limitations Guidelines and Standards

A. Overview of Technology Options

In developing its technology options, EPA determined that a different set of wastewater treatment technologies was appropriate for facilities that performed unit operations that produced primarily metal-bearing wastewater than for those facilities that performed unit operations that produced primarily oily wastes (see Section VI.C.6 for list of the unit operations that generate primarily oily only wastewater). EPA concluded that the following subcategories typically produce metal-bearing wastewater (with or without associated oily-bearing wastestreams) and evaluated metals control technologies for these subcategories: General Metals, Metal Finishing Job Shops, Non-Chromium Anodizing, Printed Wiring Boards, and Steel Forming and Finishing. For the remaining subcategories (Oily Wastes, Railroad Line Maintenance, and Shipbuilding Dry Docks), EPA evaluated oily wastewater treatment technologies. The following sections discuss the wastewater treatment technologies that EPA evaluated for each subcategory at each regulatory level (BPT, BAT, PSES, NSPS, and PSNS). See Section VI for a discussion on subcategorization.

1. Wastewater Treatment Technologies for Metal-Bearing Wastewater

MP&M facilities in the General Metals subcategory, the Metal Finishing Job Shops subcategory, the Non-Chromium Anodizing subcategory, the Printed Wiring Board subcategory, and the Steel Forming and Finishing subcategory produce primarily metal-bearing wastewater. EPA evaluated the following four wastewater treatment technology options for the MP&M industry subcategories whose unit operations produce metal-bearing wastewater (and may also produce oily wastewater):

Option 1. Segregation of wastewater streams, preliminary treatment steps as necessary (including oils removal using oil-water separation by chemical emulsion breaking), chemical precipitation using lime or sodium hydroxide, and sedimentation using a clarifier.

Option 1, as well as each of the three other options considered by EPA for the metal-bearing wastewater subcategories, includes the segregation of wastestreams and preliminary treatment of certain wastestreams. Segregation of wastewater and subsequent preliminary treatment allows for the most efficient, effective, and economic means for removing pollutants in certain wastestreams. For example, if a facility segregates its oil-bearing wastewater from its metal-bearing wastewater, then the facility can design an oil removal treatment technology based on only the oily waste flow volume and not on the combined metal-bearing and oil-bearing wastewater flow. Therefore, preliminary treatment technologies are more effective and less costly on segregated wastestreams, prior to adding wastewater that does not contain the pollutants being treated with the preliminary treatment. EPA includes these preliminary treatment steps, as applicable whenever it refers to chemical precipitation and sedimentation treatment.

As mentioned previously in Section VII (Water Use and Wastewater Characteristics), unit operations performed at MP&M sites produce wastewater with varying characteristics (*i.e.,* oil-bearing, hexavalent chromium-bearing, cyanide-bearing, complexed metals). Wastewater with these characteristics requires preliminary treatment before the chemical precipitation step for metals removal. EPA included the following preliminary steps in Option 1 for the metal-bearing wastewater subcategories: removal of oil and grease through chemical emulsion breaking, gravity separation, and oil skimming; destruction of cyanide using sodium hypochlorite; reduction of hexavalent chromium to trivalent chromium which can subsequently be precipitated as a chromium hydroxide; and chemical reduction/precipitation of chelated or complexed metals. EPA has also included the contract hauling of any wastewater associated with organic solvent degreasing as part of the Option 1 technology.

Option 1 consists of preliminary treatment for specific pollutants and end-of-pipe treatment with chemical precipitation (usually accomplished by raising the pH with an alkaline chemical such as lime or sodium hydroxide, also

known as caustic, to produce insoluble metal hydroxides) followed by clarification and sludge dewatering. This treatment has been widely used throughout the metals industry and is well documented to be effective for removing metal pollutants. As with a number of previously promulgated regulations, EPA is proposing BPT on the basis that all process wastewater, except solvent-bearing wastewater, will be treated through chemical precipitation and clarification end-of-pipe treatment.

Option 1 treatment systems (chemical precipitation with gravity clarification) sampled by EPA demonstrated effective removal for targeted metals. (Targeted metals are those metals that an MP&M facility was operating its wastewater treatment system to remove.)

Option 2. In-process flow control and pollution prevention, segregation of wastewater streams, preliminary treatment steps as necessary (including oils removal using oil-water separation by chemical emulsion breaking), chemical precipitation using lime or sodium hydroxide, and sedimentation using a clarifier.

Option 2 builds on Option 1 by adding in-process pollution prevention, recycling, and water conservation methods which allow for recovery and reuse of materials. As discussed in Section VII.B, techniques or technologies, such as centrifugation or skimming for metal working fluids, or water paint curtains, may in some cases save money for companies by allowing materials to be used over a longer period before they need to be disposed. Using these techniques along with water conservation also leads to the generation of less pollution and results in more effective treatment of the wastewater that is generated. The incorporation of pollution prevention practices can lead to smaller wastewater flows and increased pollutant concentrations. However, the treatment of metal-bearing wastewater by chemical precipitation is relatively independent of influent metal concentration. For example, a well-operated chemical precipitation and clarification treatment system can achieve the same effluent concentration with an influent stream of 1,000 gallons per minute (gpm) and 10 parts per million (ppm) as it can achieve with an influent stream which is 500 gpm and 20 ppm. In fact, within a broad range of influent concentrations, the more highly concentrated wastewater influent, when treated down to the technology effectiveness concentrations of a chemical precipitation and clarification treatment system, results in better pollutant removals and less mass of pollutant in the discharge. In addition, the cost of a treatment system is largely dependent on the size, which in turn is largely dependent on flow. As a result, good recycle and water conservation practices may result in cost savings, though there may also be associated cost increases, depending on site specific factors (*e.g.,* costs associated with capital investment for pollution prevention equipment). Option 2 in-process pollution prevention and water conservation technologies include:

- Flow reduction using flow restrictors, conductivity meters, and/or timed rinses, for all flowing rinses, plus countercurrent cascade rinsing for all flowing rinses;
- Centrifugation and recycling of painting water curtains; and
- Centrifugation and pasteurization to extend the life of water-soluble machining coolants reducing discharge volume.

Option 3. Segregation of wastewater streams, preliminary treatment steps as necessary (including oils removal by ultrafiltration), chemical precipitation using lime or sodium hydroxide, and solids separation using a microfilter.

This option differs from Option 1 in that an ultrafilter replaces the oil water separator for the removal of oil and grease and a microfilter, rather than a clarifier, follows chemical precipitation. EPA determined through sampling episodes that ultrafiltration systems are very effective for the removal of oil and grease at MP&M facilities. Ultrafilters sampled by EPA demonstrated effective removal of oil and grease. Additionally, EPA also collected treatment effectiveness data for solids removal after chemical precipitation through microfiltration. Microfilters sampled by EPA at MP&M facilities achieved long-term average effluent concentrations for targeted metals that were, in several cases, an order of magnitude lower than the long-term averages achieved by Option 2.

Option 4. In-process flow control and pollution prevention, segregation of wastewater streams, preliminary treatment steps as necessary (including oils removal by ultrafiltration), chemical precipitation using lime or sodium hydroxide, and solids separation using a microfilter.

This option builds on Option 3 by adding in-process pollution prevention, recycling, and water conservation methods which allow for recovery and reuse of materials. EPA included the same water conservation and pollution control technologies in Option 4 as in Option 2.

For all of the subcategories with metal-bearing wastewater, EPA determined that Option 2 costed less than Option 1 and demonstrated greater pollutant removals. Likewise, for all subcategories with metal-bearing wastewater, Option 4 costed less than Option 3 and demonstrated greater pollutant removals. As discussed above, the incorporation of water conservation and pollution prevention technologies results in greater pollutant removals and less mass of pollutant in the discharge. In addition, the cost of a treatment system is largely dependent on the size, which in turn is largely dependent on flow. As a result, Options 2 and 4, which include water conservation and pollution prevention, have smaller flows requiring treatment and are projected to cost less than Options 1 and 3, respectively. Therefore, for the remainder of the discussions in this preamble regarding technology options for subcategories with metal-bearing wastewater, EPA only considers Options 2 and 4. The Agency has fully evaluated Options 1 and 3, and a discussion of the results of this evaluation is contained in the Technical Development Document. EPA requests comment on its determination that pollution prevention, recycle and water conservation result in net cost savings to facilities, and examples of any specific situations where this may not be true.

2. Wastewater Treatment Technologies for Oily Wastewater

MP&M facilities in the Oily Wastes subcategory, the Railroad Line Maintenance subcategory, and the Shipbuilding Dry Dock subcategory produce primarily oil-bearing wastewater. EPA evaluated the following six wastewater treatment technology options for the MP&M industry subcategories whose unit operations produce only oily wastewater (see Section VI.C.6 for a discussion of oily unit operations):

Option 5. Oil-water separation by Chemical Emulsion Breaking.

Chemical emulsion breaking is used to break stable oil/water emulsions (oil dispersed in water, stabilized by electrical charges and emulsifying agents). A stable emulsion will not separate or break down without chemical treatment. Chemical emulsion breaking is applicable to wastewater streams containing emulsified coolants and lubricants such as machining and grinding coolants and impact or pressure deformation lubricants as well as cleaning solutions that contain emulsified oils.

Treatment of spent oil/water emulsions involves using chemicals to break the emulsion followed by gravity differential separation. The major

equipment required for chemical emulsion breaking includes reaction chambers with agitators, chemical storage tanks, chemical feed systems, pumps and piping. Factors to be considered for destroying emulsions are type of chemicals, dosage and sequence of addition, pH, mixing, heating requirements, and retention time. EPA describes this technology option in more detail in Section 8 of the Technical Development Document.

In an effort to evaluate this technology option, EPA performed sampling episodes at several facilities in the Oily Wastes subcategory that employed chemical emulsion breaking followed by gravity separation and oil skimming.

Option 6. In-process Flow Control, Pollution Prevention, and Oil-water separation by chemical emulsion breaking.

This option builds on Option 5 by adding in-process pollution prevention, recycling, and water conversation methods which allow for recovery and reuse of materials. EPA included the same pollution prevention techniques or technologies discussed in Option 2 such as flow reduction and reuse, paint curtain recycling and/or recirculation, and coolant recycling, as applicable.

Option 7. Oil-water separation by ultrafiltration.

In the MP&M industry, ultrafiltration is applied in the treatment of oil/water emulsions. In ultrafiltration, a semi-permeable microporous membrane performs the separation. Wastewater is sent through membrane modules under pressure. Water and low-molecular-weight solutes (for example, salts and some surfactant) pass through the membrane and are removed as permeate. Emulsified oil and suspended solids are rejected by the membrane and are removed as concentrate. The concentrate is reticulated through the membrane unit until the flow of the permeate drops. The permeate may either be discharged or passed along to another treatment unit. The concentrate is contained and held for further treatment or disposal. EPA describes this technology option in more detail in Section 8 of the Technical Development Document.

In an effort to evaluate this technology option, EPA performed sampling episodes at several facilities in the Oily Wastes subcategory that employed ultrafiltration. EPA also collected data on ultrafiltration systems at metal-bearing facilities which segregated their oily wastestreams for treatment.

Option 8. In-process Flow Control, Pollution Prevention, and Oil-water separation by Ultrafiltration.

This option builds on Option 7 by adding in-process pollution prevention, recycling, and water conversation methods which allow for recovery and reuse of materials. EPA included the same water conservation and pollution control technologies in Option 8 as in Option 6.

Option 9. Oil-water Separation by Dissolved Air Flotation.

Dissolved air flotation (DAF) is commonly used to remove suspended solids and dispersed oil and grease from oily wastewater. DAF is the process of using fine bubbles to induce suspended particles to rise to the surface of a tank where they can be collected and removed. The major components of a conventional DAF unit include a centrifugal pump, a retention tank, an air compressor, and a flotation tank. EPA describes this technology option in more detail in Section 8 of the Technical Development Document.

In an effort to evaluate this technology option, EPA performed sampling episodes at several facilities in the Railroad Line Maintenance and Shipbuilding Dry Dock subcategories that employed dissolved air flotation (DAF). EPA compared the effluent concentrations achieved by these DAF systems to effluent concentration achieved by DAF systems in other industry categories (*e.g.,* industrial laundries).

Option 10. In-process Flow Control, Pollution Prevention, and Oil-water separation by Dissolved Air Flotation.

This option builds on Option 9 by adding in-process pollution prevention, recycling, and water conversation methods which allow for recovery and reuse of materials. EPA included the same water conservation and pollution control technologies in Option 10 as in Option 6 and 8.

For all of the subcategories with only oily wastewater, EPA determined that the options that involved water conservation and pollution prevention costed less and removed more pollutant than those options that did not include these technologies or techniques. As discussed above, the incorporation of water conservation and pollution prevention technologies results in greater pollutant removals and less mass of pollutant in the discharge. In addition, the cost of a treatment system is largely dependent on the size, which in turn is largely dependent on flow. As a result, Options 6, 8, and 10, which all include water conservation and pollution prevention, cost less than their counterpart options (Options 5, 7, and 9, respectively) that did not include these pollution prevention technologies or techniques. Therefore, for the remainder of the discussions in this preamble regarding technology options for subcategories with oily wastewater, EPA only considers Options 6, 8, and 10. However, the Agency fully evaluated Options 5, 7, and 9, and discusses the results of this evaluation in the Technical Development Document.

B. Determination of Long-Term Averages, Variability Factors, and Limitations

1. Overview of Limitations Calculations

EPA visited over 200 facilities and sampled wastewater from 71 MP&M facilities covering all the industrial sectors covered by this proposed rule. (See Section III for a discussion on applicability). In addition to sampling to characterize the process wastewater, EPA sampled 46 end-of-pipe chemical precipitation and clarification treatment systems, 5 microfilters, 5 oil-water emulsion breaking and gravity separation systems, 16 ultrafilters, and 4 chemical emulsion breaking and DAF systems. EPA reviewed the treatment data gathered and identified data considered appropriate for calculating limitations for the MP&M industry. EPA identified data from well-designed and well-operated treatment systems and focused on data for specific pollutants processed and treated on site. The data editing procedures used for this assessment consisted of four major steps:

- Assessment of the performance of the entire treatment system;
- Identification of process upsets during sampling that impacted the treatment effectiveness of the system;
- Identification of pollutants not present in the raw wastewater at sufficient concentrations to evaluate treatment effectiveness; and
- Identification of treatment chemicals used in the treatment system.

EPA describes the evaluation criteria used for each of these steps below. The Agency excluded data that failed one or more of the evaluation criteria from calculation of the limitations.

Assessment of Treatment System Performance. EPA assessed the performance of the entire treatment system during sampling. The Agency excluded data for systems identified as not being well-designed or well-operated from use in calculating BPT limitations. EPA first identified the metals processed on site, as well as if the site performed unit operations likely to generate oil and grease and cyanide. EPA focused on these pollutants because MP&M facilities typically design and operate their treatment systems to treat and remove these

pollutants. EPA then performed the following technical analyses of the treatment systems:

—Based on the pollutants processed or treated on site, EPA excluded data from systems that were not operated at the proper pH for removal of the pollutants.

—EPA excluded data from chemical precipitation and clarification systems that did not have solids removal indicative of effective treatment. In general, EPA identified as having poor solids removal systems that did not achieve at least 90 percent removal of total suspended solids (TSS) and had effluent TSS concentrations greater than 50 milligrams per liter. EPA made site-specific exceptions to this rule.

—EPA excluded data from chemical precipitation and clarification systems at which the concentration of most of the metals present in the influent stream did not decrease, indicating poor treatment.

Although EPA believes this is an appropriate practice, in order to focus on facilities with well-run treatment systems, it also introduces a risk of biasing estimates of treatment effectiveness upwards with respect to identifying pollutant removals on a national basis. If a particular metal is not able to be effectively removed by a particular treatment train, but its concentration fluctuates randomly over time in both the influent and the effluent, then retaining only data showing positive ''removals'' may give a misleading impression of effectiveness of that treatment technology nationally. Some commenters have raised this issue in the past particularly with respect to boron, which those commenters believe is not effectively removed by certain treatment trains where EPA's data (edited to include only decreases) appears to show removals. EPA is continuing to assess this concern both with regards to metals in general and with regards to boron in particular. EPA requests comment on this issue and suggestions for addressing it. EPA is planning to do a re-analysis of its estimates of its baseline load and removals for boron and will provide results of this analysis when available. This analysis will be placed in Section 6.8 of the public record.

Identification of Process Upsets Occurring During Sampling. EPA reviewed the sampling episode reports for each of the sampled sites and identified any process upsets that resulted in poor treatment during one or more days of the sampling episode. EPA excluded the data affected by the process upsets.

Identification of Pollutants Not Present in the Raw Wastewater at Sufficient Concentrations to Evaluate Removal. EPA excluded data for pollutants that it did not detect in the treatment influent streams at a sampled facility, or it detected at concentrations less than 10 times the minimum level. Because these proposed limitations are technology-based, EPA requires that a facility must demonstrate pollutant removal through treatment in order for that data to be used in the calculation of effluent limitations. Therefore, the Agency determined that for a BPT/BAT facility to demonstrate effective treatment, the pollutant must be present in the wastewater at a treatable concentration—which EPA defined as 10 times the minimum level for this proposal. EPA also excluded data for pollutants that were not processed on site. In addition, EPA reviewed the water use practices for the sampled sites and excluded data from sites that may have been diluting the raw wastewater and reducing the concentration of pollutants processed on site. Because these proposed MP&M effluent guidelines include water conservation practices and pollution prevention technologies, EPA reviewed the data to ensure that the facilities it used as the basis for BPT limitations had these practices and technologies in place.

Identification of Wastewater Treatment Chemicals. EPA identified treatment chemicals used in each of the sampled treatment systems to determine if the removal of the metals used as treatment chemicals were consistent with removal of other metals on site, indicating a well-designed and well-operated system. If a sampled facility used a metal as a treatment chemical, and the facility treated the metal to a concentration consistent with other metals removed on site, EPA included the metal in calculation of the BPT limitations. If the sampled facility used a metal as a treatment chemical and the treatment system did not remove it to a concentration consistent with other metals removed on site, EPA excluded the treatment chemical from calculation of the limitations. (Note that this practice may raise similar concerns to those discussed above with respect to editing out data that do not show positive removals.) The Agency used the data remaining after these data editing procedures to calculate the limitations.

Calculation of Limitations

The Technical Development Document and the Statistical Support Document contain a detailed description of the statistical methodology used for the calculation of limitations. EPA based the effluent limitations and standards in today's notice on widely-recognized statistical procedures for calculating long-term averages and variability factors. The following presents a summary of the statistical methodology used in the calculation of effluent limitations.

Effluent limitations for each subcategory are based on a combination of long-term average effluent values and variability factors that account for variation in day-to-day treatment performance within a treatment plant. The long-term averages are average effluent concentrations that have been achieved by well-operated treatment systems using the proposed treatment technologies described in Section VIII. The purpose of the variability factor is to allow for normal variation in effluent concentrations. A facility that designs and operates its treatment system to achieve a long-term average on a consistent basis should be able to comply with the daily and monthly limitations in the course of normal operations.

EPA developed the variability factors and long-term averages from a database composed of individual measurements on treated effluent based on EPA sampling data. EPA sampling data reflects the performance of a system over a three to five day period, although not necessarily over consecutive days.

EPA performed the following steps in order to calculate the proposed limitations for each pollutant. For each subcategory, EPA calculated the arithmetic long-term average concentration of a pollutant for each facility representing the proposed treatment technology, and determined the median from the arithmetic average concentrations. For each pollutant, this median concentration is the long-term average (LTA) concentration that EPA used in determining the proposed effluent limitations.

The Agency then used the modified delta-lognormal distribution to estimate daily and monthly variability factors. This is the same distributional model used by EPA in the final rulemakings for the Pulp and Paper and Centralized Waste Treatment. The modified delta-lognormal distribution models the data as a mixture of non-detect observations and measured values. EPA selected this distribution because the data for most analytes consisted of a mixture of measured values and non-detects. The modified delta-lognormal distribution assumes that all non-detects have a value equal to the sample specific

detection limit and that the detected values follow a lognormal distribution.

The Agency fit the daily concentration data from each facility that had enough detected concentration values for parameter estimation to a modified delta lognormal distribution. The daily variability factor for each pollutant at each facility is the ratio of the estimated 99th percentile of the distribution of the daily pollutant concentration values divided by the expected value of the distribution of the daily values. (EPA assumed that the furthest excursion from the LTA that a well-operated plant using the proposed technology option could be expected to make on a daily basis was a point below which 99 percent of the data for that facility falls, under the assumed distribution.) The pollutant daily variability factor for a treatment technology is the average of the pollutant daily variability factors from the facilities with that technology. EPA calculates the daily maximum limitation as the product of the pollutant LTA concentration and the daily variability factor.

The Agency calculates the monthly maximum limitation in much the same way. However, it bases the variability factor (known as the monthly variability factor) on the 95th percentile of the distribution of four-day average pollutant concentrations instead of the 99th percentile. Therefore, the monthly variability factor for each pollutant at each facility is the estimated 95th percentile of the distribution of the 4-day average pollutant concentration values divided by the expected value of the distribution of the daily values. The pollutant monthly variability factor for a treatment technology is the average of the pollutant monthly variability factors from the facilities with that technology. EPA calculates the maximum monthly average limitation as the product of the pollutant LTA concentration and the monthly variability factor.

There were several instances where variability factors could not be calculated directly from the MP&M database because there were not at least two effluent values measured above the minimum detection level for a specific pollutant. In these cases, the sample size of the data is too small to allow distributional assumptions to be made. Therefore, in order to assume a variability factor for a pollutant, the Agency transferred variability factors from other pollutants that exhibit similar treatability characteristics within the treatment system. The Technical Development Document and the Statistical Support Document provide detailed information on the transfer of variability factors.

IX. Best Practicable Control Technology Currently Available (BPT)

As discussed in Section II, in the guidelines for an industry category, EPA defines BPT effluent limits for conventional, toxic (priority), and non-conventional pollutants for direct discharging facilities. In specifying BPT, EPA looks at a number of factors. EPA first considers the cost of achieving effluent reductions in relation to the effluent reduction benefits. The Agency also considers the age of the equipment and facilities, the processes employed and any required process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the Agency deems appropriate (CWA 304(b)(1)(B)). Traditionally, EPA establishes BPT effluent limitations based on the average of the best performances of facilities within the industry of various ages, sizes, processes or other common characteristics. Where existing performance is uniformly inadequate, EPA may require higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied. See ''A Legislative History of the Federal Water Pollution Control Act Amendments of 1972'', U.S. Senate Committee of Public Works, Serial No. 93–1, January 1973, p. 1468.

In addition, CWA Section 304(b)(1)(B) requires a cost-reasonableness assessment for BPT limitations. In determining the BPT limits, EPA must consider the total cost of treatment technologies in relation to the effluent reduction benefits achieved. This inquiry does not limit EPA's broad discretion to adopt BPT limitations that are achievable with available technology unless the required additional reductions are ''wholly out of proportion to the costs of achieving such marginal level of reduction.'' See Legislative History, op. cit. p. 170. Moreover, the inquiry does not require the Agency to quantify benefits in monetary terms. See, for example, American Iron and Steel Institute v. EPA, 526 F.2d 1027 (3rd Cir., 1975). For the BPT cost-reasonableness assessment, EPA used the total pounds of COD removed for the General Metals, Metal Finishing Job Shops, Non-Chromium Anodizing, Steel Forming and Finishing, and Oily Wastes, and Railroad Line Maintenance subcategories because this parameter best represented the pollutant removals without counting removals of individual pollutants more than once. EPA used O&G for the cost-reasonableness assessment for the Shipbuilding Dry Dock subcategories because it best represented the pollutant removals for these subcategories without counting removals of individual pollutants more than once.

In balancing costs against the benefits of effluent reduction, EPA considers the volume and nature of expected discharges after application of BPT, the general environmental effects of pollutants, and the cost and economic impacts of the required level of pollution control. In past effluent limitations guidelines and standards, BPT cost-reasonableness has ranged from $0.94/lb-removed to $34.34/lb-removed in 1996 dollars. In developing guidelines, the Act does not require or permit consideration of water quality problems attributable to particular point sources, or water quality improvements in particular bodies of water. Therefore, EPA has not considered these factors in developing the limitations being proposed today. See *Weyerhaeuser Company* v. *Costle*, 590 F. 2d 1011 (D.C. Cir. 1978).

Table IX–1 below summarizes the pounds of pollutants removed for direct dischargers, and Table IX–2 summarizes the costs, costs per pound removed, and economic impacts for direct dischargers associated with each of the proposed options by subcategory. (See Section XII for summary tables for indirect dischargers.)

TABLE IX–1.—POUNDS OF POLLUTANTS REMOVED BY THE PROPOSED BPT OPTION FOR DIRECT DISCHARGERS BY SUBCATEGORY

Subcategory [1] (number of facilities)	Selected option	TSS (lbs removed/yr)	O&G (lbs removed/yr)	COD (lbs removed/yr)	Priority and nonconventional metals (lbs removed/yr)	Priortiy and nonconventional organics (lbs removed/yr)	Cyanide (lbs removed/yr)
General Metals (3,794)	Option 2	10.1 million	7.8 million	181 million	4 million	5 million	184,000
Metal Finishing Job Shops (15) [2]	Option 2	13,000	14,400	232,000	34,000	4,600	5,700

TABLE IX–1.—POUNDS OF POLLUTANTS REMOVED BY THE PROPOSED BPT OPTION FOR DIRECT DISCHARGERS BY SUBCATEGORY—Continued

Subcategory [1] (number of facilities)	Selected option	TSS (lbs removed/ yr)	O&G (lbs removed/ yr)	COD (lbs removed/ yr)	Priority and nonconventional metals (lbs removed/ yr)	Priortiy and nonconventional organics (lbs removed/ yr)	Cyanide (lbs removed/ yr)
Printed Wiring Boards (11) [2]	Option 2	51,000	238,000	1.3 million	172,000	22,000	1,400
Steel Forming and Finishing (43)	Option 2	884,000	101,000	4.5 million	387,000	76,000	1,100
Oily Waste (911)	Option 6	349,000	885,000	5.1 million	81,000	127,000	10
Railroad Line Maintenance (34)	Option 10	9,000	47,400	59,000	1,000	78	0
Shipbuilding Dry Dock (6)	Option 10	650	8.5 million	0	1,400	700	0

[1] EPA did not identify any direct discharging facilities in the Non-Chromium Anodizing subcategory; therefore, there are no estimated removals. See Section IX.C.
[2] Although EPA is not revising limits for TSS and O&G for these two subcategories, removals are reported based on incidental removals for the proposed MP&M Option 2 technology for BPT control of toxic and nonconventional pollutants.

EPA notes that the pounds removed presented in Table IX–1 may differ from the pounds removed presented in the Economic Analysis section (Section XVI). This difference is a result of the fact that when performing certain economic analyses (*e.g.,* cost-effectiveness), the Agency does not include facilities (or the associated pollutant loadings and removals) that closed at the baseline (*i.e.,* EPA predicted that these facilities would close prior to the implementation of the MP&M rule). Table IX–1 above estimates that annual pounds removed by the selected option for all of the direct discharging facilities in EPA's questionnaire data base that discharged wastewater at the time the data were collected.

TABLE IX–2.—ANNUALIZED COSTS AND ECONOMIC IMPACTS OF THE PROPOSED BPT OPTION FOR DIRECT DISCHARGERS BY SUBCATEGORY

Subcategory [1] (number of facilities)	Selected option	Annualized compliance costs for selected option ($1996)	Economic impacts (facility closures) of selected option (Percent of regulated subcategory)	BPT cost per pound removed [2] (1996 $/pound removed)
General Metals (3,794)	Option 2	230 million	20 (<1%)	1.22
Metal Finishing Job Shops (15)	Option 2	1.3 million	0	5.60
Printed Wiring Boards (11)	Option 2	2.5 million	0	1.92
Steel Forming and Finishing (43)	Option 2	29.3 million	0	6.51
Oily Waste (911)	Option 6	11.2 million	0	2.18
Railroad Line Maintenance (34)	Option 10	1.18 million	0	20.00
Shipbuilding Dry Dock (6)	Option 10	2.15 million	0	0.25

[1] EPA did not identify any direct discharging facilities in the Non-Chromium Anodizing subcategory; therefore, there are no estimated costs. See Section IX.C for estimates based on a model facility.
[2] EPA based the pounds used in calculating the BPT cost reasonableness on the COD removals only (shown in Table IX–1) for each subcategory, except for the use of oil and grease removals only (shown in Table IX–1) for the shipbuilding dry dock subcategory.

A. General Metals Subcategory

1. Need for BPT Regulation

EPA describes the General Metals subcategory in Section VI.C.1 of this preamble. The Agency estimates that there are approximately 3,800 direct discharging facilities in the General Metals subcategory. EPA estimates that the direct discharging facilities in the General Metals subcategory currently discharge substantial quantities of pollutants into the surface waters of the United States, including 8.2 million pounds per year of oil and grease, 10.9 million pounds per year of total suspended solids, 187 million pounds of COD, 5.2 million pounds per year of priority and nonconventional metal pollutants, 5.2 million pounds of priority and nonconventional organic pollutants, and 187,000 pounds per year of cyanide. As a result of the quantity of pollutants currently discharged directly to the nation's waters by General Metals facilities, EPA determined that there was a need for BPT regulation for this subcategory.

2. Selected BPT Option

Facilities in the General Metals subcategory generally perform unit operations such as cleaning, etching, electroplating, electroless plating, and conversion coating that produce metal-bearing wastewater. In addition, some of these facilities also perform machining and grinding, impact deformation, and surface preparation operations that generate oily wastewater. Therefore, EPA considered technology options 1 through 4 for this subcategory because technologies included in these options treat both oily wastewater as well as metal-bearing wastewater. As explained above, EPA only discusses Options 2 and 4 in detail in this preamble since these options costed less and removed more pollutant than Options 1 and 3 (respectively). See Section VIII.A.1 for a discussion of technology options.

The Agency is proposing Option 2 as the basis for the new BPT regulation for the General Metals subcategory. EPA's decision to propose BPT limitations based on Option 2 treatment reflects primarily two factors: (1) The degree of effluent reductions attainable, and (2) the total cost of the proposed treatment technologies in relation to the effluent reductions achieved. No basis could be found for identifying different BPT limitations based on age, size, process or other engineering factors. Neither the age nor the size of a facility in the General Metals subcategory will directly

affect the treatability of MP&M process wastewater. For facilities in this subcategory, the most pertinent factors for establishing the limitations are costs of treatment and the level of effluent reductions obtainable.

In Table IX–1 above, EPA presents the annual pollutant removals for direct dischargers for Option 2, and in Table IX–2 above, it presents the cost per pound removed using only the pounds of COD removed. EPA estimates that implementation of Option 2 will cost $1.22 per pound of COD removed (1996 $). The Agency has concluded that the costs of BPT Option 2 are achievable and are reasonable as compared to the removals achieved by this option.

The technology proposed in Option 2 represents the average of the best performing facilities due to the prevalence of chemical precipitation followed by sedimentation in this subcategory. Approximately 22 percent of the direct discharging facilities in the General Metals subcategory employ chemical precipitation followed by a clarifier (Option 2) while less than 1 percent employ microfiltration after chemical precipitation (Option 4).

Based on the available data base, Option 4 on an annual basis only removes an additional 66,000 pounds of TSS, 12,300 pounds of O&G, 15,000 pounds of priority metals, and 880,000 pounds of nonconventional metals, while removing 324,000 pounds less COD and 31,000 pounds less priority and nonconventional organic pollutants than Option 2. Although there is a large amount of additional removals of TSS and nonconventional metals for Option 4 when considered across the entire population (3,800 facilities), the Agency determined that these additional removals were not significant when considered on a per facility basis. In addition, Option 4's annualized cost is $52 million more than Option 2. EPA concluded that the lack of significant additional pollutant removals per facility achieved by Option 4 (and the fact that it removes less COD and organic pollutants) support the selection of Option 2 as the BPT technology basis.

3. Calculation of BPT Limitations for the General Metals Subcategory

EPA explained its data editing procedures and statistical methodology for calculating BPT limitations in Section VIII.B. In general, the Agency calculated BPT limitations for this subcategory using data from General Metals facilities employing Option 2 technology. For cyanide limitations, EPA used data from all subcategories where cyanide destruction systems were sampled. If data was not sufficient for developing BPT limitations for an individual pollutant in this subcategory, the Agency transferred data from another subcategory (see the Technical Development Document for a more detailed discussion). See the proposed rule § 438.12 following this preamble for a list of the proposed BPT limitations for the General Metals Subcategory. (See Section XXI.C for a discussion of monitoring flexibility.) The Statistical Development Document contains detailed information on which facilities EPA used in calculating the proposed BPT limitations.

B. Metal Finishing Job Shops Subcategory

1. Need for BPT Regulation

EPA describes the Metal Finishing Job Shops subcategory in Section VI.C.2 of this preamble. The Agency estimates that there are approximately 15 direct discharging facilities in the Metal Finishing Job Shops subcategory. EPA has previously promulgated BPT and BAT limitations for all of the facilities in this subcategory at 40 CFR part 413 (Electroplating Pretreatment Standards) and at 40 CFR part 433 (Metal Finishing Effluent Limitations Guidelines and Pretreatment Standards). However, EPA developed the existing regulations applicable to the facilities in the Metal Finishing Job Shops subcategory approximately 20 years ago, and since that time, advances in electroplating and metal finishing processes, water conservation, pollution prevention, and wastewater treatment have occurred. EPA is proposing new BPT effluent limitations guidelines for this subcategory.

EPA estimates that direct discharging facilities in the Metal Finishing Job Shops subcategory currently discharge substantial quantities of pollutants into the surface waters of the United States, including 17,900 pounds per year of oil and grease, 20,500 pounds per year of TSS, 287,400 pounds per year of COD, 44,000 pounds per year of priority and nonconventional metal pollutants, 6,000 pounds per year of priority and nonconventional organic pollutants, and 6,000 pounds per year of cyanide. As a result of the quantity of pollutants currently discharged directly to the nation's waters by metal finishing job shop facilities, EPA determined that there was a need for BPT regulation for this subcategory.

2. Selected BPT Option

Facilities in the Metal Finishing Job Shops subcategory generally perform unit operations such as cleaning, etching, electroplating, electroless plating, passivating, and conversion coating that produce metal-bearing wastewater. In addition, some of these facilities also perform machining and grinding, impact deformation, and surface preparation operations that generate oily wastewater. Therefore, EPA considered technology options 1 through 4 for this subcategory because technologies included in these options treat both oily wastewater as well as metal-bearing wastewater. As explained above, EPA only discusses Options 2 and 4 in detail in this preamble since these options costed less and removed more pollutant than Options 1 and 3, respectively.

The Agency is proposing Option 2 as the basis for BPT regulation for the Metal Finishing Job Shops subcategory. The new BPT limitations incorporate more stringent effluent requirements for priority metals, nonconventional pollutants, cyanide, and organic pollutants (by way of an indicator parameter) as compared to the limitations contained in 40 CFR 433.13. EPA has included the conventional pollutants, TSS and oil and grease, in the new BPT regulation for this subcategory at the same level as 40 CFR 433.13. EPA's decision to propose BPT limitations based on Option 2 treatment reflects primarily two factors: (1) The degree of effluent reductions attainable and (2) the total cost of the proposed treatment technologies in relation to the effluent reductions achieved. No basis could be found for identifying different BPT limitations based on age, size, process or other engineering factors. Neither the age nor the size of a facility in the Metal Finishing Job Shop subcategory will directly affect the treatability of MP&M process wastewater. For facilities in this subcategory, the most pertinent factors for establishing the limitations are costs of treatment and the level of effluent reductions obtainable. EPA based its decision not to revise the conventional pollutant limitations on the use of the alternate organics control parameters (*i.e.,* TOC or TOP) and the small additional removals of TSS obtainable after the incidental removal due to control of the metals.

In Table IX–1 above, EPA presents the annual pollutant removals for direct dischargers for Option 2, and in Table IX–2 above, it presents the cost per pound removed using only the pounds of COD removed. EPA estimates that implementation of Option 2 will cost $5.60 per pound of COD removed (1996$). The Agency has concluded that the costs of BPT Option 2 are achievable and are reasonable as compared to the removals achieved by this option.

The technology proposed in Option 2 represents the average of the best performing facilities due to the prevalence of chemical precipitation followed by sedimentation in the subcategory. The Agency estimates that 100 percent of the direct discharging facilities in the Metal Finishing Job Shops subcategory employ chemical precipitation followed by a clarifier (Option 2) while no facilities employ microfiltration after chemical precipitation (Option 4). Because no facilities in this subcategory employ microfiltration after chemical precipitation for solids separation, the Agency concluded that Option 4 does not represent the average of the best treatment.

Based on the available data base, Option 4 on an annual basis only removes an additional 6,900 pounds of priority and nonconventional metals, while removing 1,500 pounds less COD, and 600 pounds less priority and nonconventional organic pollutants than Option 2. EPA concluded that the lack of significant overall additional pollutant removals achieved by Option 4 (and the fact that it removes less COD, and organic pollutants) support the selection of Option 2 as the BPT technology basis.

3. Calculation of BPT Limitations for the Metal Finishing Job Shops Subcategory

EPA explained its data editing procedures and statistical methodology for calculating BPT limitations in Section VIII.B. In general, EPA calculated the new BPT limitations for this subcategory using data from facilities in the Metal Finishing Job Shops subcategory employing Option 2 technology. As discussed above, EPA did not calculate new limitations for TSS or oil and grease for this subcategory. Instead, EPA set them at the same level as in the Metal Finishing effluent guidelines (40 CFR 433.13). For cyanide limitations, EPA used data from all subcategories where cyanide destruction systems were sampled. If data was not sufficient for developing BPT limitations for an individual pollutant in this subcategory, the Agency transferred data from another subcategory (see the Technical Development Document for a more detailed discussion). See the proposed rule § 438.22 following this preamble for a list of the proposed BPT limitations for the Metal Finishing Job Shops subcategory. (See Section XXI.C for a discussion of monitoring flexibility.) The Statistical Development Document contains detailed information on which facilities EPA used in calculating the proposed BPT limitations.

C. Non-Chromium Anodizing Subcategory

1. Need for BPT Regulation

EPA describes the Non-Chromium Anodizing subcategory in Section VI.C.3 of this preamble. EPA's survey of the MP&M industry did not identify any non-chromium anodizing facilities discharging directly to surface waters. All of the non-chromium anodizing facilities in EPA's data base are either indirect or zero dischargers. EPA consequently could not evaluate any treatment systems in place at direct discharging non-chromium anodizing facilities for establishing BPT limitations. Therefore, EPA relied on technology transfer based on information and data from indirect discharging facilities in the Non-Chromium Anodizing subcategory. The Agency concluded that the technology in place at some indirect discharging non-chromium anodizers is appropriate to use as the basis for regulation of direct dischargers because the pollutant profile of the wastewater generated at non-chromium anodizers discharging directly would be similar in character to that from indirect discharging non-chromium anodizers and the model technologies in place at indirect dischargers are effective in treating the conventional pollutants that are generally not regulated in pretreatment standards.

EPA has previously promulgated BPT and BAT limitations for all of the facilities in this subcategory at 40 CFR part 433 (Metal Finishing Effluent Limitations Guidelines and Pretreatment Standards). However, EPA developed the regulations applicable to this subcategory approximately 20 years ago, and since that time, advances in anodizing processes, water conservation, pollution prevention, and wastewater treatment have occurred. EPA is proposing to set new BPT effluent limitations guidelines for this subcategory for metals, but is not revising the limitations for conventional pollutants (TSS and oil and grease). EPA based its decision not to revise the limitations for conventional pollutants on the small additional removals attainable after the incidental removal due to control of the metals.

The current regulations in 40 CFR part 433 require non-chromium anodizing facilities to meet effluent limitations for 7 metal pollutants. EPA's data show that these seven metals are present only in very small quantities in the current discharges at non-chromium anodizing facilities. Under the Metal Finishing effluent guidelines, EPA did not establish a BPT limit for aluminum, the metal found in the largest quantity in non-chromium anodizers wastewater. The Agency has determined that direct discharging facilities in the Non-Chromium Anodizing subcategory should have a limit for aluminum and thus is proposing to replace BPT in 40 CFR part 433 with new MP&M effluent limitations that more appropriately reflect the pollutants found in non-chromium anodizing wastewater. EPA notes that the Agency expects a reduction in monitoring burden associated with this revision for direct discharging non-chromium anodizing facilities.

2. Selected BPT Option

Facilities in the Non-Chromium Anodizing subcategory generally perform unit operations such as cleaning, etching, and anodizing of aluminum, that produce metal-bearing wastewater. The majority of the metal found in anodizing wastewater is aluminum. In addition, some of these facilities also perform machining and grinding, impact deformation, and surface preparation operations that generate oily wastewater. Therefore, EPA considered technology options 1 through 4 for this subcategory because technologies included in these options treat both oily wastewater as well as metal-bearing wastewater. As explained above, EPA only discusses Options 2 and 4 in detail in this preamble since these options costed less and removed more pollutant than Options 1 and 3 (respectively).

The Agency is proposing Option 2 as the basis for BPT regulation for the Non-Chromium Anodizing subcategory. Although EPA did not identify any existing non-chromium anodizers, EPA estimated the cost of treatment and pollutant removal for a median-sized direct discharging facility with a wastewater flow of 6.25 MGY, based on the characteristics of a similarly sized indirect discharging non-chromium anodizer facility. Because direct dischargers are more likely to have treatment in place, EPA provided the model facility with treatment in place equivalent to Option 1. Therefore at the model direct discharging non-chromium anodizing facility, EPA estimates that implementation of Option 2 will cost $0.83 per pound COD removed (1996$), and has found that cost to be reasonable. EPA estimates that Option 2 would remove 25,700 pounds of pollutants per median-sized facility per year (including 9,200 pounds of TSS as incidental removals based on the control of metals and 1,240 pounds of aluminum).

Additionally, because solids separation by microfiltration is not used by any non-chromium anodizer facilities, the Agency concluded that Option 4 does not represent best practicable control technology for this subcategory.

3. Calculation of BPT Limitations for the Non-Chromium Anodizing Subcategory

EPA explained its data editing procedures and statistical methodology for calculating BPT limitations in Section VIII.B. Because EPA's survey did not identify any direct dischargers in this subcategory, EPA used data from indirect discharging facilities to develop the BPT limitations. The Agency identified two indirect discharging facilities in this subcategory that achieved very good pollutant reductions (including, on average, 96 percent reduction of aluminum and incidental removals of 95 percent for TSS). Therefore, EPA determined that the data from these facilities were appropriate for the development of BPT limitations. If data was not sufficient for developing BPT limitations for an individual pollutant in this subcategory, the Agency transferred data from another subcategory (see the Technical Development Document for a more detailed discussion). In the case of TSS and oil and grease, EPA used the limitations in 40 CFR part 433.13. See the proposed rule § 438.32 following this preamble for a list of the proposed BPT limitations for the Non-Chromium Anodizers Subcategory. (See Section XXI.C for a discussion of monitoring flexibility.) The Statistical Development Document contains detailed information on which facilities EPA used in calculating the proposed BPT limitations.

D. Printed Wiring Board Subcategory

1. Need for BPT Regulation

EPA describes the Printed Wiring Board subcategory in Section VI.C.4 of this preamble. The Agency estimates that there are approximately 11 direct discharging facilities in this subcategory. EPA has previously promulgated BPT and BAT limitations for all of the facilities in this subcategory at 40 CFR part 433 (Metal Finishing Effluent Limitations Guidelines and Pretreatment Standards). However, EPA developed the regulations applicable to this subcategory approximately 20 years ago, and since that time, advances in printed wiring board manufacturing processes, water conservation practices, pollution prevention techniques, and wastewater treatment have occurred. EPA is proposing to set new BPT effluent limitations guidelines for this subcategory.

EPA estimates that direct discharging facilities in the Printed Wiring Board subcategory currently discharge substantial quantities of pollutants into the surface waters of the United States, including 262,000 pounds per year of oil and grease, 100,000 pounds per year of total suspended solids, 1.7 million pounds per year of COD, 242,000 pounds per year of priority and nonconventional metal pollutants, 35,000 pounds per year of priority and nonconventional organic pollutants, and 1,600 pounds per year of cyanide. As a result of the quantity of pollutant currently discharged directly to the nation's waters by printed wiring board facilities, EPA determined that there was a need for BPT regulation for this subcategory.

2. Selected BPT Option

Facilities in the Printed Wiring Board subcategory generally perform unit operations such as cleaning, etching, masking, electroplating, electroless plating, applying, developing and stripping of photoresist, and tin/lead soldering that produce metal-bearing and organic-bearing wastewater. Therefore, EPA considered technology options 1 through 4 for this subcategory. As explained above, EPA only discusses Options 2 and 4 in detail in this preamble since these options costed less and removed more pollutant than Options 1 and 3 (respectively).

The Agency is proposing Option 2 as the basis for BPT regulation for the Printed Wiring Board subcategory. The new BPT limitations incorporate more stringent effluent requirements for priority metals, nonconventional pollutants, cyanide, and organic pollutants (by way of an indicator parameter) as compared to the limitations contained in 40 CFR part 433.13. EPA has included the conventional pollutants, TSS and oil and grease, in the new BPT regulation for this subcategory at the same level as 40 CFR part 433.13. Removals for these pollutants are incidental removals based on the increased control of metals and organic pollutants (by way of an indicator parameter) by the proposed BPT technology options. EPA's decision to propose BPT limitations based Option 2 treatment for priority metals, nonconventional pollutants, cyanide and organic pollutants reflects primarily two factors: (1) The degree of effluent reductions attainable and (2) the total cost of the proposed treatment technologies in relation to the effluent reductions achieved. No basis could be found for identifying different BPT limitations based on age, size, process or other engineering factors. Neither the age nor the size of a facility in the Printed Wiring Board subcategory will directly affect the treatability of MP&M process wastewater. For facilities in this subcategory, the most pertinent factors for establishing the limitations are costs of treatment and the level of effluent reductions obtainable.

In Table IX–1 above, EPA presents the annual pollutant removals for direct dischargers for Option 2, and in Table IX–2 above, it presents the cost per pound removed using only the pounds of COD removed. EPA estimates that implementation of Option 2 will cost $1.92 per pound of COD removed (1996$). The Agency has concluded that the costs of BPT Option 2 are achievable and are reasonable as compared to the removals achieved by this option.

The technology proposed in Option 2 represents the average of the best performing facilities due to the prevalence of chemical precipitation followed by sedimentation in this subcategory. The Agency estimates that 100 percent of the direct discharging facilities in the Printed Wiring Board subcategory employ chemical precipitation and sedimentation treatment (Option 2); however, the Agency did identify indirect dischargers in this subcategory with Option 4 technology in place. In fact, EPA collected wastewater treatment samples at one indirect discharging printed wiring board manufacturing facility that employed Option 4 technology.

Based on the available data base, Option 4 on an annual basis only removes an additional 48,000 pounds of priority and nonconventional metals, while removing 9,000 less pounds of COD, and 250 less pounds of priority and nonconventional organic pollutants than Option 2. In addition, Option 4's annualized cost is $2 million more than Option 2. EPA concluded that the lack of significant overall additional pollutant removals achieved by Option 4 (and the fact that it removes less COD, and organic pollutants) support the selection of Option 2 as the BPT technology basis.

3. Calculation of BPT Limitations for the Printed Wiring Board Subcategory

EPA explained its data editing procedures and statistical methodology for calculating BPT limitations in Section VIII.B. In general, EPA calculated the new BPT limitations for this subcategory using data from facilities in the Printed Wiring Board subcategory employing Option 2 technology. As discussed above, EPA

did not calculate new limitations for TSS or oil and grease for this subcategory. Instead, EPA set them at the same level as in the Metal Finishing effluent guidelines (40 CFR part 433.13). For cyanide limitations, EPA used data from all subcategories where cyanide destruction systems were sampled. If data was not sufficient for developing BPT limitations for an individual pollutant in this subcategory, the Agency transferred data from another subcategory (see the Technical Development Document for a more detailed discussion). See the proposed rule § 438.42 following this preamble for a list of the proposed BPT limitations for the Printed Wiring Board subcategory. (See Section XXI.C. for a discussion of monitoring flexibility.) The Statistical Development Document contains detailed information on which facilities EPA used in calculating the proposed BPT limitations.

E. Steel Forming and Finishing Subcategory

1. Need for BPT Regulation

EPA describes the Steel Forming & Finishing subcategory in Section VI.C.5 of this preamble. The Agency estimates that there are approximately 43 direct discharging facilities in this subcategory. EPA has previously promulgated BPT and BAT limitations for all of the facilities in this subcategory at 40 CFR part 420 (Iron and Steel Manufacturing Effluent Limitations Guidelines and Pretreatment Standards). However, EPA developed the regulations applicable to this subcategory approximately 20 years ago, and since that time, changes in the industry, particularly in growth of the number of facilities conducting steel forming and finishing operations without the presence of the typical steel manufacturing processes, and changes in water conservation practices, pollution prevention techniques, and wastewater treatment have occurred. In addition, the operations covered by this proposed rule are segments of the forming and finishing subcategories in 40 CFR part 420. The proposed MP&M subcategory is comprised of limitations and standards based on specific forming and finishing operations only.

EPA estimates that direct discharging facilities in the new Steel Forming & Finishing subcategory currently discharge substantial quantities of pollutants into the surface waters of the United States, including 195,000 pounds per year of oil and grease, 1.08 million pounds per year of total suspended solids, 6 million pounds per year of COD, 771,000 pounds per year of priority and nonconventional metal pollutants, 168,000 pounds per year of priority and nonconventional organic pollutants, and 2,300 pounds per year of cyanide. As a result of the quantity of pollutant currently discharged directly to the nation's waters by steel forming & finishing facilities, EPA determined that there was a need for BPT regulation for this subcategory. In a separate notice, EPA is proposing to revise other subcategories in the Iron and Steel Manufacturing effluent guidelines.

2. Selected BPT Option

Facilities in the proposed MP&M Steel Forming & Finishing subcategory generally perform unit operations such as acid pickling, annealing, conversion coating (*e.g.,* zinc phosphate, copper sulfate), hot dip coating, electroplating, heat treatment, welding, and drawing of steel bar, rod, and wire that produce metal-bearing and oil-bearing wastewater. Therefore, EPA considered technology options 1 through 4 for this subcategory. As explained above, EPA only discusses Options 2 and 4 in detail in this preamble since these options costed less and removed more pollutant than Options 1 and 3 (respectively).

The Agency is proposing Option 2 as the basis for the new BPT regulation for the Steel Forming & Finishing subcategory. EPA's decision to propose BPT limitations based on Option 2 treatment reflects primarily two factors: (1) the degree of effluent reductions attainable and (2) the total cost of the proposed treatment technologies in relation to the effluent reductions achieved. No basis could be found for identifying different BPT limitations based on age, size, process or other engineering factors. Neither the age nor the size of a facility in the Steel Forming and Finishing subcategory will directly affect the treatability of MP&M process wastewater. For facilities in this subcategory, the most pertinent factors for establishing the limitations are costs of treatment and the level of effluent reductions obtainable.

In Table IX–1 above, EPA presents the annual pollutant removals for direct dischargers for Option 2, and in Table IX–2 above, it presents the cost per pound removed using only the pounds of COD removed. EPA estimates that implementation of Option 2 will cost $6.51 per pound of COD removed ($1996). The Agency has concluded that the costs of BPT Option 2 are achievable and are reasonable as compared to the removals achieved by this option.

The technology proposed in Option 2 represents the average of the best performing facilities due to the prevalence of chemical precipitation followed by sedimentation in this subcategory. The Agency estimates that 64 percent of the direct discharging facilities in this subcategory employ chemical precipitation followed by sedimentation (Option 2). Because no facilities in this subcategory employ microfiltration after chemical precipitation for solids separation, the Agency concluded that Option 4 does not represent best practicable control technology.

3. Calculation of BPT Limitations for the Steel Forming & Finishing Subcategory

EPA explained its data editing procedures and statistical methodology for calculating BPT limitations in Section VIII.B. In general, EPA calculated BPT limitations for this subcategory using data transferred from facilities employing Option 2 technology in the General Metals subcategory. However, EPA determined that mass-based limitations (rather than concentration-based limitations developed for the General Metals subcategory) are more appropriate for this subcategory. Facilities in this subcategory keep close track of their production on a mass basis primarily because of their prior regulation under the mass-based Iron & Steel Manufacturing effluent guidelines. Furthermore, EPA determined that mass-based limitations are appropriate for this subcategory due to the uniform nature of the products produced (wire, rod, bar, pipe, and tube). The uniform nature of the products produced by this industry makes for an easier conversion from concentration-based to mass-based limitations. One of the primary reasons that EPA is not requiring mass-based limitations for other subcategories is the fact that most MP&M facilities do not collect production information on a wastestream-by-wastestream basis, and therefore development of mass-based limitations could create a significant burden for both the POTW and the MP&M facility. In the case of the Steel Forming and Finishing subcategory, EPA is able to use the industry's production information to propose production-based limitations for the steel forming and finishing subcategory.

EPA solicits paired treatment system influent and effluent data from Steel Forming & Finishing facilities, so that limits may better reflect treatment at steel forming and finishing facilities. EPA also solicits comment on whether to allow concentration-based limits for this subcategory and any rationale for doing so. For cyanide limitations, EPA used data from all subcategories where cyanide destruction systems were sampled (see the Technical

Development Document for a more detailed discussion). See the proposed rule § 438.52 following this preamble for a list of the proposed BPT limitations for the Steel Forming & Finishing subcategory. (See Section XXI.C for a discussion of monitoring flexibility.) The Statistical Development Document contains detailed information on which facilities EPA used in calculating the proposed BPT limitations.

F. Oily Wastes Subcategory

1. Need for BPT Regulation

EPA describes the Oily Wastes subcategory in Section VI.C.6 of this preamble. EPA estimates that approximately 900 MP&M direct discharging facilities in the Oily Wastes subcategory currently discharge substantial quantities of pollutants into the surface waters of the United States, including 965,000 pounds per year of oil and grease, 414,00 pounds per year of total suspended solids, 6.4 million pounds per year of COD, 595,000 pounds per year of priority and nonconventional metal pollutants, and 135,000 pounds per year of priority and nonconventional organic pollutants. As a result of the quantity of pollutant currently discharged directly to the nation's waters by Oily Waste facilities, EPA determined that there was a need for BPT regulation for this subcategory.

2. Selected BPT Option

Facilities in the Oily Wastes subcategory generally perform unit operations such as alkaline cleaning and its associated rinses to remove oil and dirt from components, machining and grinding producing wastewater containing coolants and lubricants, and dye penetrant and magnetic flux testing that produce mainly oil-bearing wastewater (see Section VI.C.6 for a list of the unit operations that define the applicability of this subcategory). Because of the oily nature of the wastewater, EPA considered technology options 5 through 8 for this subcategory. (EPA did not consider oily wastewater treatment using DAF (Options 9 and 10) because it was not widely used by facilities in this subcategory. The Agency analyzed the DAF options for the Railroad Line Maintenance and Shipbuilding Dry Dock subcategories only.) As explained above, EPA only discusses Options 6 and 8 in detail in this preamble since these options costed less and removed more pollutant than Options 5 and 7 (respectively).

The Agency is proposing Option 6, oil-water separation by chemical emulsion breaking, gravity separation, and oil skimming, as the basis for the new BPT regulation for the Oily Wastes subcategory. EPA's decision to propose BPT limitations based on Option 6 treatment reflects primarily two factors: (1) the degree of effluent reductions attainable and (2) the total cost of the proposed treatment technologies in relation to the effluent reductions achieved. No basis could be found for identifying different BPT limitations based on age, size, process or other engineering factors. Neither the age nor the size of a facility in the Oily Wastes subcategory will directly affect the treatability of MP&M process wastewater. For facilities in this subcategory, the most pertinent factors for establishing the limitations are costs of treatment and the level of effluent reductions obtainable.

In Table IX–1 above, EPA presents the annual pollutant removals for direct dischargers for Option 6, and in Table IX–2 above, it presents the cost per pound removed using only the pounds of COD removed. EPA estimates that implementation of Option 6 will cost $2.18 per pound of COD removed (1996$). The Agency has concluded that the costs of BPT Option 6 are achievable and are reasonable as compared to the removals achieved by this option.

The technology proposed in Option 6 represents the average of the best performing facilities due to the prevalence of chemical emulsion breaking and oil-skimming in this subcategory. The Agency estimates that 11 percent of the direct discharging facilities in the Oily Wastes subcategory perform oil-water separation through chemical emulsion breaking (Option 6) while only 4 percent employ ultrafiltration (Option 8).

Based on the available data base, Option 8 on an annual basis only removes an additional 19,000 pounds of TSS, 56,600 pounds of O&G, while removing 1.42 million less pounds of COD, 12,000 less pounds of priority and nonconventional metals, and 2,400 less pounds of priority and nonconventional organic pollutants than Option 6. In addition, Option 8's annualized cost is $43 million more than Option 6. EPA concluded that the lack of significant overall additional pollutant removals achieved by Option 8 do not justify its use as a basis for BPT for this subcategory.

3. Calculation of BPT Limitations for the Oily Wastes subcategory

EPA explained its data editing procedures and statistical methodology for calculating BPT limitations in Section VIII.B. EPA calculated BPT limitations for this subcategory using data from facilities in the Oily Wastes subcategory employing Option 6 technology. See the proposed rule § 438.62 following this preamble for a list of the proposed BPT limitations for the Oily Wastes subcategory. (See Section XXI.C for a discussion of monitoring flexibility.) The Statistical Development Document contains detailed information on which facilities EPA used in calculating the proposed BPT limitations.

G. Railroad Line Maintenance Subcategory

1. Need for BPT Regulation

EPA describes the Railroad Line Maintenance subcategory in Section VI.C.7 of this preamble. The Agency estimates that there are approximately 34 direct discharging facilities in this subcategory. EPA determined that BPT limitations for this subcategory were necessary because of the oil and grease and potential TSS loads that facilities in this subcategory generate. EPA estimates that direct discharging facilities in the Railroad Line Maintenance subcategory currently discharge substantial quantities of pollutants into the surface waters of the United States, including 52,000 pounds per year of oil and grease, 170,000 pounds per year of COD, 18,000 pounds per year of total suspended solids, 54,000 pounds per year of priority and nonconventional metal pollutants, and 1,600 pounds per year of priority and nonconventional organic pollutants. As a result of the quantity of pollutant currently discharged directly to the nation's waters by Railroad Line Maintenance facilities, EPA determined that there was a need for BPT regulation for this subcategory.

2. Selected BPT Option

Facilities in the Railroad Line Maintenance subcategory generally perform unit operations that produce mainly oil-bearing wastewater such as alkaline cleaning and its associated rinses to remove oil and dirt from components, and machining and grinding which use coolants and lubricants. Because of the oily nature of the wastewater, EPA considered technology options 7 through 10 for this subcategory. (EPA did not consider oily wastewater treatment using oil-water separation through emulsion breaking (Options 5 and 6) for this subcategory because a large number of railroad line maintenance facilities currently use DAF (Options 9 and 10)). As explained above, EPA only discusses Options 8 and 10 in detail in this preamble since these options costed less and removed

more pollutant than Options 7 and 9 (respectively).

The Agency is proposing Option 10, oil-water separation by DAF, as the basis for the new BPT regulation for the Railroad Line Maintenance subcategory. EPA's decision to propose BPT limitations based on Option 10 treatment reflects primarily two factors: (1) the degree of effluent reductions attainable and (2) the total cost of the proposed treatment technologies in relation to the effluent reductions achieved. No basis could be found for identifying different BPT limitations based on age, size, process or other engineering factors. Neither the age nor the size of a facility in the Railroad Line Maintenance subcategory will directly affect the treatability of MP&M process wastewater. For facilities in this subcategory, the most pertinent factors for establishing the limitations are costs of treatment and the level of effluent reductions obtainable.

In Table IX–1 above, EPA presents the annual pollutant removals for direct dischargers for Option 10, and in Table IX–2 above, it presents the cost per pound removed using only the pounds of O&G removed. EPA estimates that implementation of Option 10 will cost $20.00 per pound of COD removed (1996$). The Agency has concluded that the costs of BPT Option 10 are achievable and are reasonable as compared to the removals achieved by this option.

The technology proposed in Option 10 represents the average of the best performing facilities due to the prevalence of DAF in this subcategory. The Agency estimates that 91 percent of the direct discharging facilities in the Railroad Line Maintenance subcategory employ DAF (Option 10) while no facilities employ ultrafiltration (Option 8). Because no facilities in this subcategory employ ultrafiltration for removal of O&G, the Agency concluded that Option 8 does not represent best practicable control technology.

3. Calculation of BPT Limitations for the Railroad Line Maintenance Subcategory

EPA explained its data editing procedures and statistical methodology for calculating BPT limitations in Section VIII.B. EPA calculated BPT limitations for this subcategory using data from facilities in the Railroad Line Maintenance subcategory employing Option 10 technology. In cases where data from the Railroad Line Maintenance subcategory was not sufficient for a particular pollutant, the Agency transferred effluent data from facilities in the Shipbuilding Dry Dock subcategory in order to develop a proposed BPT limitation (see the Technical Development Document for a more detailed discussion). See the proposed rule § 438.72 following this preamble for a list of the proposed BPT limitations for the Railroad Line Maintenance subcategory. (See Section XXI.C for a discussion of monitoring flexibility.) The Statistical Development Document contains detailed information on which facilities EPA used in calculating the proposed BPT limitations.

H. Shipbuilding Dry Dock Subcategory

1. Need for BPT Regulation

EPA describes the Shipbuilding Dry Dock subcategory in Section VI.C.8 of this preamble. The Agency estimates that there are six direct discharging facilities in this subcategory. The Agency notes that many shipbuilders operate multiple dry docks (or similar structures) and that this is the number of estimated facilities (not dry docks) that discharge MP&M process wastewater from dry docks (and similar structures). EPA determined that BPT limitations for this subcategory were necessary because of the oil and grease and potential TSS loads that facilities in this subcategory generate. EPA estimates that direct discharging facilities in the Shipbuilding Dry Dock subcategory currently discharge substantial quantities of pollutants into the surface waters of the United States, including 8.5 million pounds per year of oil and grease, 18,400 pounds per year of total suspended solids, 976,000 pounds per year of COD, 88,500 pounds per year of priority and nonconventional metal pollutants, and 6,000 pounds per year of priority and nonconventional organic pollutants. As a result of the quantity of pollutant currently discharged directly to the nation's waters by Shipbuilding Dry Dock facilities, EPA determined that there was a need for BPT regulation for this subcategory.

2. Selected BPT Option

Facilities in the Shipbuilding Dry Dock subcategory generally perform unit operations that produce mainly oil-bearing wastewater such as abrasive blasting, hydroblasting, painting, welding, corrosion preventive coating, floor cleaning, aqueous degreasing, and testing (*e.g.,* hydrostatic testing). Because of the oily nature of the wastewater, EPA considered technology options 7 through 10 for this subcategory. (EPA did not consider oily wastewater treatment using oil-water separation through chemical emulsion breaking (Options 5 and 6) for this subcategory because all of the shipbuilding dry dock facilities in EPA's database currently use DAF (Options 9 and 10)). As explained above, EPA only discusses Options 8 and 10 in detail in this preamble since these options costed less and removed more pollutant than Options 7 and 9 (respectively).

The Agency is proposing Option 10, oil-water separation by DAF, as the basis for the new BPT regulation for the Shipbuilding Dry Dock subcategory. EPA's decision to propose BPT limitations based Option 10 treatment reflects primarily two factors: (1) The degree of effluent reductions attainable and (2) the total cost of the proposed treatment technologies in relation to the effluent reductions achieved. No basis could be found for identifying different BPT limitations based on age, size, process or other engineering factors. Neither the age nor the size of a facility in the Shipbuilding Dry Dock subcategory will directly affect the treatability of MP&M process wastewater. For facilities in this subcategory, the most pertinent factors for establishing the limitations are costs of treatment and the level of effluent reductions obtainable.

In Table IX–1 above, EPA presents the annual pollutant removals for direct dischargers for Option 10, and in Table IX–2 above, it presents the cost per pound removed using only the pounds of O&G removed. EPA estimates that implementation of Option 10 will cost $0.25 per pound of O&G removed (1996$). The Agency has concluded that the costs of BPT Option 10 are achievable and are reasonable as compared to the removals achieved by this option.

The technology proposed in Option 10 represents the average of the best performing facilities due to the prevalence of DAF in this subcategory. According to EPA's database, 100 percent of the direct discharging facilities in the Shipbuilding Dry Dock subcategory employ DAF (Option 10) while no facilities employ ultrafiltration (Option 8). Because no facilities in this subcategory employ ultrafiltration for removal of O&G, the Agency concluded that Option 8 does not represent best practicable control technology.

3. Calculation of BPT Limitations for the Shipbuilding Dry Dock Subcategory

EPA explained its data editing procedures and statistical methodology for calculating BPT limitations in Section VIII.B. EPA calculated BPT limitations for this subcategory using data from facilities in the Shipbuilding Dry Dock subcategory employing Option 10 technology. See the proposed rule § 438.82 following this preamble for a

list of the proposed BPT limitations for the Shipbuilding Dry Dock subcategory. (See Section XXI.C. for a discussion of monitoring flexibility.) The Statistical Development Document contains detailed information on which facilities EPA used in calculating the proposed BPT limitations.

X. Best Conventional Pollutant Control Technology (BCT)

A. July 9, 1986 BCT Methodology

The BCT methodology, promulgated in 1986 (51 FR 24974), discusses the Agency's consideration of costs in establishing BCT effluent limitations guidelines. EPA evaluates the reasonableness of BCT candidate technologies (those that are technologically feasible) by applying a two-part cost test:

(1) The POTW test; and

(2) The industry cost-effectiveness test.

In the POTW test, EPA calculates the cost per pound of conventional pollutant removed by industrial dischargers in upgrading from BPT to a BCT candidate technology and then compares this cost to the cost per pound of conventional pollutant removed in upgrading POTWs from secondary treatment. The upgrade cost to industry must be less than the POTW benchmark of $0.25 per pound (in 1976 dollars).

In the industry cost-effectiveness test, the ratio of the incremental BPT to BCT cost divided by the BPT cost for the industry must be less than 1.29 (*i.e.,* the cost increase must be less than 29 percent).

B. Discussion of BCT Option for Metal-Bearing Wastewater

For today's proposed rule, EPA considered whether or not to establish BCT effluent limitation guidelines for MP&M sites that would attain incremental levels of effluent reduction beyond BPT for TSS. The only technology option identified to attain further TSS reduction is the addition of multimedia filtration to existing BPT systems. For the BCT option, EPA considered the addition of multimedia filtration to the BPT technology option for the General Metals, Metal Finishing Job Shops, Non-Chromium Anodizing, Printed Wiring Board, and Steel Forming and Finishing subcategories (*i.e.,* the metal-bearing subcategories).

EPA applied the BCT cost test to use of multimedia filtration technology as a means to reduce TSS loadings. EPA split the MP&M sites into three flow categories: less than 10,000 gallons per year (gpy)); 10,000 gpy to 1,000,000 gpy; and greater than 1,000,000 gpy. For each of these three flow categories, EPA chose a representative site for which EPA had estimated the costs of installing the Option 2 technologies discussed under BPT (See Section IX above). The Agency evaluated the costs of installing a polishing multimedia filter to remove an estimated additional 35 percent of the TSS discharged after chemical precipitation and clarification treatment. This estimated removal reflects the reduced TSS concentrations seen when filters are used after chemical precipitation and sedimentation in the MP&M industry. The cost per pound removed for facilities discharging greater than 1 MGY was $13/lb of TSS (in 1976 dollars), the cost per pound removed for facilities discharging between 10,000 and 1,000,000 gpy was $518/lb and the cost per pound removed for facilities discharging less than 10,000 gpy was $1,926/lb of TSS (in 1976 dollars). All of these cases individually as well as combined exceed the $0.25/lb (in 1976 dollars) POTW cost test value. Because these costs exceed the POTW benchmark, the first part of the cost test fails; therefore, the second part of the test was unnecessary. Therefore, EPA determined that multimedia filtration does not pass the cost test for BCT regulations development. In light of the above, EPA is proposing to set BCT limitations for the General Metals, Metal Finishing Job Shops, Non-Chromium Anodizing, Printed Wiring Board, and Steel Forming and Finishing subcategories equivalent to BPT limitations for their respective subcategories.

C. Discussion of BCT Option for Oily Wastewater

For today's proposed rule, EPA considered whether or not to establish BCT effluent limitation guidelines for MP&M facilities that would attain incremental levels of effluent reduction beyond BPT for O&G. EPA considered the addition of an ultrafilter to existing BPT systems (oil-water separation by chemical emulsion breaking, gravity separation, and oil skimming) as a viable technology option to attain further O&G reduction. EPA considered this BCT option for the Oily Wastes, Railroad Line Maintenance, and Shipbuilding Dry Dock subcategories.

EPA applied the BCT cost test to use of ultrafiltration technology as a means to reduce O&G loadings. EPA split the MP&M sites into three flow categories: less than 10,000 gallons per year (gpy); 10,000 gpy to 1,000,000 gpy; and greater than 1,000,000 gpy. For each of these three flow categories, EPA chose a representative site for which EPA had estimated the costs of installing the Option 2 technologies discussed under BPT (See Section IX above). The Agency evaluated the costs of installing an ultrafilter to remove an estimated additional 36 percent of the O&G discharged after oil-water separation by chemical emulsion breaking, gravity separation, and oil skimming. This estimated removal reflects the reduced O&G concentrations seen when ultrafilters are used after chemical emulsion breaking with oil skimming in the MP&M industry. The cost per pound removed for facilities discharging greater than 1 MGY was $238/lb of O&G (in 1976 dollars), the cost per pound removed for facilities discharging between 10,000 and 1,000,000 gpy was $2,213/lb, and the cost per pound removed for facilities discharging less than 10,000 gpy was $5,031/lb of O&G (in 1976 dollars). All of these cases individually as well as combined exceed the $0.25/lb (in 1976 dollars) POTW cost test value. Because these costs exceed the POTW benchmark, the first part of the cost test fails; therefore, the second part of the test was unnecessary. Therefore, EPA determined that ultrafiltration does not pass the cost test for BCT regulations development. In light of the above, EPA is proposing to set BCT limitations for the Oily Wastes, Railroad Line Maintenance and Shipbuilding Dry Dock subcategories equivalent to BPT limitations for their respective subcategories.

XI. Best Available Technology Economically Achievable (BAT)

EPA considers the following factors in establishing the best available technology economically achievable (BAT) level of control: the age of process equipment and facilities, the processes employed, process changes, the engineering aspects of applying various types of control techniques, the costs of applying the control technology, economic impacts imposed by the regulation, non-water quality environmental impacts such as energy requirements, air pollution and solid waste generation, and other such factors as the Administrator deems appropriate (section 304(b)(2)(B) of the Act). In general, the BAT technology level represents the best existing economically achievable performance among plants with shared characteristics. In making the determination about economic achievability, the Agency takes into consideration factors such as plant closures and product line closures. Where existing wastewater treatment performance is uniformly inadequate,

BAT technology may be transferred from a different subcategory or industrial category. BAT may also include process changes or internal plant controls which are not common industry practice.

EPA considered the same 10 technology options for BAT as it discussed under BPT. EPA did not include the application of filters, discussed under BPT, as a BAT option. Data collected during sampling at MP&M facilities demonstrated very little, if any, additional removal of many metal pollutants resulting from the use of filters as compared to concentrations of the same metals after the chemical precipitation and clarification treatment followed by gravity settling. Thus, although filtration is demonstrated to be effective in achieving additional removals of suspended solids, and as such EPA considered it for the basis of BPT, multimedia or sand filtration does not reflect the best available technology performance for priority and nonconventional pollutants.

For all of the MP&M subcategories (except Railroad Line Maintenance and Shipbuilding Dry Dock subcategories), EPA is proposing BAT limitations equivalent to BPT. For the Railroad Line Maintenance and Shipbuilding Dry Dock subcategories, EPA is not proposing BAT limitations. EPA briefly discusses the BAT selection for each of the subcategories below and refers to Section IX for a detailed discussion of the need for BPT regulation, the selected BPT technology option, the calculation of BPT limitations, and the estimated removals and costs of BPT for each subcategory.

A. General Metals Subcategory

EPA has not identified any more stringent economically-achievable treatment technology option which it considered to represent BAT level of control applicable to General Metals subcategory facilities. Therefore, the Agency is proposing to establish BAT equivalent to BPT for toxic and nonconventional pollutants for the General Metals subcategory. EPA estimates that 20 facilities (less than 1 percent of the direct dischargers in this subcategory) will close as a result of BAT based on Option 2. EPA found this option to be economically achievable for the subcategory as a whole. Additionally, the Agency believes that Option 2 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level.

EPA did evaluate BPT Option 4 as a basis for establishing BAT more stringent than the BPT level of control being proposed today. EPA estimates that the economic impact due to the additional controls at Option 4 levels would result in 35 facility closures (<1 percent of the direct dischargers in this subcategory). See Section XVI.E for a discussion on job losses. While EPA does not have a bright line for determining what level of impact is economically achievable for the industry as a whole, EPA looked for a breakpoint that would mitigate adverse economic impacts without greatly affecting the toxic pound equivalents being removed under the proposed rule. By selecting Option 2 as BAT, EPA was able to reduce facility closures by 43 percent, while only losing about 1.5 percent of the toxic pound equivalents that would be removed under Option 4. Option 4 resulted in some level of improved pollutant reductions; however, the amounts are not very large and the cost of implementing the level of control associated with Option 4 is disproportionately high. Thus, EPA rejected Option 4 as a basis for BAT for this subcategory.

B. Metal Finishing Job Shops Subcategory

The Agency is proposing to establish BAT equivalent to BPT for toxic and nonconventional pollutants for the Metal Finishing Job Shop subcategory. EPA estimates that no facilities will close as a result of BAT based on Option 2. Therefore, the Agency found this Option to be economically achievable. Additionally, the Agency believes that Option 2 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level.

EPA did evaluate transferring technology reflected in BPT Option 4 as a basis for establishing BAT more stringent than the BPT level of control being proposed today. As was the case for BAT based on Option 2, EPA estimates that no facilities would close as a result of BAT based on Option 4. Therefore, EPA does consider Option 4 to be economically achievable for this subcategory. However, EPA is not proposing to establish BAT limitations based on Option 4 because it determined that Option 2 achieves nearly equivalent reductions in pound-equivalents for much less cost. By selecting Option 2 as the basis for BAT, EPA reduced annualized compliance costs by $1.1 million (1996$) while only losing 2 percent of the toxic pound equivalents that would be removed under Option 4. The Agency concluded that the additional costs of Option 4 do not justify the lack of significant additional pollutant removals achieved for direct dischargers in this subcategory. Therefore, EPA determined that Option 2 is the ''best available'' technology economically achievable for the Metal Finishing Job Shop subcategory.

C. Non-Chromium Anodizing Subcategory

The Agency is proposing to establish BAT equivalent to BPT for toxic and nonconventional pollutants for the Non-Chromium Anodizing subcategory. As mentioned in the BPT discussion, EPA's survey of the MP&M industry did not identify any non-chromium anodizing facilities discharging directly to surface waters. All of the non-chromium anodizing facilities in EPA's data base are either indirect or zero dischargers. EPA consequently could not evaluate any treatment systems in place at direct discharging non-chromium anodizing facilities for establishing BAT limitations. Therefore, EPA relied on information and data from indirect discharging facilities in the Non-Chromium Anodizing subcategory. Based on this analysis the Agency believes that Option 2 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level.

EPA did evaluate transferring technology reflected in BPT Option 4 as a basis for establishing BAT more stringent than the BPT level of control being proposed today. However, EPA is not proposing to establish BAT limitations based on Option 4 because it determined that Option 2 achieves nearly equivalent reductions in pound-equivalents for much less cost. EPA used a facility with a flow of 6.25 MGY (the median discharge flow for indirect discharging facilities in this subcategory) to model the costs and pollutant loads reduced for a direct discharging facility. Because direct dischargers are more likely to have treatment in place, EPA provided the model facility with treatment in place equivalent to Option 1. Based on this model facility, EPA estimated that annualized compliance costs per facility for Option 2 will be $41,000 (1996$) less than Option 4, and Option 2 will remove only 83 pound-equivalents less than Option 4. The Agency concluded that the additional costs of Option 4 do not justify the additional pollutant removals achieved for direct dischargers in this subcategory. Therefore, EPA determined that Option 2 is the ''best available'' technology economically

achievable for the Non-Chromium Anodizing subcategory.

D. Printed Wiring Board Subcategory

The Agency is proposing to establish BAT equivalent to BPT for toxic and nonconventional pollutants for the Printed Wiring Board subcategory. EPA estimates that no facilities will close as a result of BAT based on Option 2. Therefore, the Agency found this option to be economically achievable. Additionally, the Agency believes that Option 2 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level.

EPA did evaluate BPT Option 4 as a basis for establishing BAT more stringent than the BPT level of control being proposed today. As was the case for BAT based on Option 2, EPA estimates that no facilities would close as a result of BAT based on Option 4. Therefore, EPA does consider Option 4 to be economically achievable for this subcategory. However, EPA is not proposing to establish BAT limitations based on Option 4 because it determined that Option 2 achieves nearly equivalent reductions in pound-equivalents for much less cost. By selecting Option 2 as the basis for BAT, EPA reduced annualized compliance costs by $2 million (1996$) while only losing 3 percent of the toxic pound equivalents that would be removed under Option 4. The Agency concluded that the additional costs of Option 4 do not justify the lack of significant additional pollutant removals achieved for direct dischargers in this subcategory. Therefore, EPA determined that Option 2 is the ''best available'' technology economically achievable for the Printed Wiring Board subcategory.

E. Steel Forming & Finishing Subcategory

The Agency is proposing to establish BAT equivalent to BPT for toxic and nonconventional pollutants for the Steel Forming & Finishing subcategory. EPA estimates that no facilities will close as a result of BAT based on Option 2. Therefore, the Agency found this Option to be economically achievable. Additionally, the Agency believes that Option 2 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level.

EPA did evaluate transferring technology reflected in BPT Option 4 as a basis for establishing BAT more stringent than the BPT level of control being proposed today. EPA is not proposing to establish BAT limitations based on Option 4 because it determined that Option 2 achieves nearly equivalent reductions in pound-equivalents for much less cost. By selecting Option 2 as the basis for BAT, EPA reduced annualized compliance costs by $2.6 million (1996$) while only losing 3 percent of the toxic pound equivalents that would be removed under Option 4. The Agency concluded that the additional costs of Option 4 do not justify the insignificant additional pollutant removals achieved for direct dischargers in this subcategory.

F. Oily Wastes Subcategory

EPA has not identified any more stringent economically-achievable treatment technology option which it considered to represent BAT level of control applicable to Oily Wastes subcategory facilities. Therefore, the Agency is proposing to establish BAT equivalent to BPT for toxic and nonconventional pollutants for the Oily Wastes subcategory. EPA estimates that no facilities will close as a result of BAT based on Option 6. Additionally, the Agency believes that Option 6 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level.

EPA did evaluate BPT Option 8 (ultrafiltration) as a basis for establishing BAT more stringent than the BPT level of control being proposed today. As was the case for BAT based on Option 6, EPA estimates that no facilities would close as a result of BAT based on Option 8. Therefore, EPA does consider Option 8 to be economically achievable for this subcategory. However, based on the available data base, EPA is not proposing to establish BAT limitations based on Option 8 because it removes fewer pound-equivalents than Option 6. Therefore, the Agency determined that Option 6 is the ''best available'' technology economically achievable for the removal of priority pollutants from wastewater generated at Oily Wastes subcategory facilities.

G. Railroad Line Maintenance Subcategory

EPA is not proposing to establish BAT regulations for the Railroad Line Maintenance subcategory. The Agency concluded that the facilities in this subcategory discharge very few pounds of toxic pollutants. EPA estimates that 34 railroad line maintenance facilities discharge 1,100 pound equivalents per year to surface waters, or about 32 pound equivalents per year per facility. The Agency based the loadings calculations on EPA sampling data, which found very few priority toxic pollutants at treatable levels in raw wastewater. Therefore, nationally-applicable regulations are unnecessary at this time and direct dischargers will remain subject to permit limitations for toxic and nonconventional pollutants established on a case-by-case basis using best professional judgement.

H. Shipbuilding Dry Dock Subcategory

EPA is not proposing to establish BAT regulations for the Shipbuilding Dry Dock subcategory because of the small number of facilities in this subcategory. EPA estimates that there are 6 shipbuilding facilities operating one or more dry docks in the U.S. that discharge directly to surface waters. EPA determined that nationally-applicable regulations are unnecessary at this time because of the small number of facilities in this subcategory. The Agency believes that limitations established on a case-by-case basis using best professional judgement can more appropriately address individual toxic and nonconventional pollutants that may be present at these six facilities.

XII. Pretreatment Standards for Existing Sources (PSES)

A. Need for Pretreatment Standards

Indirect dischargers in the MP&M industrial category, like the direct dischargers, use raw materials that contain many priority pollutant and nonconventional metal pollutants. These indirect facilities may discharge many of these pollutants to POTWs at significant mass or concentration levels, or both. EPA estimates that indirect discharging facilities annually discharge approximately 125 million pounds of priority and nonconventional metals, and 47 million pounds of priority and nonconventional organic pollutants.

Unlike direct dischargers whose wastewater will receive no further treatment once it leaves the facility, indirect dischargers send their wastewater to POTWs for further treatment, which occurs unless there is a bypass, upset, or sewer overflow. EPA establishes pretreatment standards for those BAT pollutants that pass through POTWs. Therefore, for indirect dischargers, before proposing pretreatment standards, EPA examines whether the pollutants discharged by the industry ''pass through'' POTWs to waters of the U.S. or interfere with POTW operations or sludge disposal practices on a national basis. Generally, to determine if pollutants pass through POTWs, EPA compares the percentage

of the pollutant removed by well-operated POTWs achieving secondary treatment with the percentage of the pollutant removed by facilities meeting BAT effluent limitations. In this manner, EPA can ensure that the combined treatment at indirect discharging facilities and POTWs is at least equivalent to that obtained through treatment by direct dischargers.

This approach to the definition of pass-through satisfies two competing objectives set by Congress: (1) That standards for indirect dischargers be equivalent to standards for direct dischargers, and (2) that the treatment capability and performance of POTWs be recognized and taken into account in regulating the discharge of pollutants from indirect dischargers. Rather than compare the mass or concentration of pollutants discharged by POTWs with the mass or concentration of pollutants discharged by BAT facilities, EPA compares the percentage of the pollutants removed by BAT facilities to the POTW removals. EPA takes this approach because a comparison of the mass or concentration of pollutants in POTW effluents with pollutants in BAT facility effluents would not take into account the mass of pollutants discharged to the POTW from other industrial and non-industrial sources, nor the dilution of the pollutants in the POTW to lower concentrations from the addition of large amounts of other industrial and non-industrial water.

The primary source of the POTW percent removal data is the ''Fate of Priority Pollutants in Publicly Owned Treatment Works'' (EPA 440/1–82/303, September 1982), commonly referred to as the ''50–POTW Study.'' This study presents data on the performance of 50 well-operated POTWs that employ secondary biological treatment in removing pollutants. Each sample was analyzed for three conventional, 16 non-conventional, and 126 priority toxic pollutants.

At the time of the 50–POTW sampling program, which spanned approximately 2½ years (July 1978 to November 1980), EPA collected samples at selected POTWs across the U.S. The samples were subsequently analyzed by either EPA or EPA-contract laboratories using test procedures (analytical methods) specified by the Agency or in use at the laboratories. Laboratories typically reported the analytical method used along with the test results. However, for those cases in which the laboratory specified no analytical method, EPA was able to identify the method based on the nature of the results and knowledge of the methods available at the time.

Each laboratory reported results for the pollutants for which it tested. If the laboratory found a pollutant to be present, the laboratory reported a result. If the laboratory found the pollutant not to be present, the laboratory reported either that the pollutant was ''not detected'' or a value with a ''less than'' sign (<) indicating that the pollutant was below that value. The value reported along with the ''less than'' sign was the lowest level to which the laboratory believed it could reliably measure. EPA subsequently established these lower levels as the minimum levels of quantitation (MLs). In some instances, different laboratories reported different (sample-specific) MLs for the same pollutant using the same analytical method.

Because of the variety of reporting protocols among the 50–POTW Study laboratories (pages 27 to 30, 50–POTW Study), EPA reviewed the percent removal calculations used in the pass-through analysis for previous industry studies, including those performed when developing effluent guidelines for Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) Manufacturing, Centralized Waste Treatment (CWT), and Commercial Hazardous Waste Combustors. EPA found that, for 12 parameters, different analytical minimum levels were reported for different rulemaking studies (10 of the 21 metals, cyanide, and one of the 41 organics).

To provide consistency for data analysis and establishment of removal efficiencies, EPA reviewed the 50–POTW Study, standardized the reported MLs for use in the final rules for CWT and Transportation Equipment Cleaning Industries and for this proposed rule and the Iron and Steel proposed rule. A more detailed discussion of the methodology used and the results of the ML evaluation are contained in the record for today's proposal.

In using the 50–POTW Study data to estimate percent removals, EPA has established data editing criteria for determining pollutant percent removals. Some of the editing criteria are based on differences between POTW and industry BAT treatment system influent concentrations. For many toxic pollutants, POTW influent concentrations were much lower than those of BAT treatment systems. For many pollutants, particularly organic pollutants, the effluent concentrations from both POTW and BAT treatment systems were below the level that could be found or measured. As noted in the 50–POTW Study, analytical laboratories reported pollutant concentrations below the analytical threshold level, qualitatively, as ''not detected'' or ''trace,'' and reported a measured value above this level. Subsequent rulemaking studies such as the 1987 OCPSF study used the analytical method nominal ''minimum level'' (ML) established in 40 CFR part 136 for laboratory data reported below the analytical threshold level. Use of the nominal minimum level (ML) may overestimate the effluent concentration and underestimate the percent removal. Because the data collected for evaluating POTW percent removals included both effluent and influent levels that were close to the analytical detection levels, EPA devised hierarchal data editing criteria to exclude data with low influent concentration levels, thereby minimizing the possibility that low POTW removals might simply reflect low influent concentrations instead of being a true measure of treatment effectiveness.

EPA has generally used hierarchic data editing criteria for the pollutants in the 50–POTW Study. For today's proposal, as in previous rulemakings, EPA used the following editing criteria:

- Substitute the standardized pollutant-specific analytical minimum level for values reported as ''not detected,'' ''trace,'' ''less than [followed by a number],'' or a ''number'' less than the standardized analytical minimum level,
- Retain pollutant influent and corresponding effluent values if the average pollutant influent level is greater than or equal to 10 times the pollutant minimum level (10×ML), and
- If none of the average pollutant influent concentrations are at least 10 times the minimum level, then retain average influent values greater than or equal to two times the minimum level (2×ML) along with the corresponding average effluent values. (In most cases, 2×ML will be equal to or less than 20 μg/l.)

EPA then calculates each POTW percent removal for each pollutant based on its average influent and its average effluent values. The national POTW percent removal used for each pollutant in the pass-through test is the median value of all the POTW pollutant specific percent removals.

The rationale for retaining POTW data using the ''10×ML'' editing criterion is based on the BAT organic pollutant treatment performance editing criteria initially developed for the 1987 OCPSF regulation (52 FR 42522, 42545–48; November 5, 1987). BAT treatment system designs in the OCPSF industry typically achieved at least 90 percent removal of toxic pollutants. Since most

of the OCPSF effluent data from BAT biological treatment systems had values of ''not detected,'' the average influent concentration for a compound had to be at least 10 times the analytical minimum level for the difference to be meaningful (demonstration of at least 90 percent removal) and qualify effluent concentrations for calculation of effluent limits.

Additionally, due to the large number of pollutants of concern for the MP&M industry, EPA also used data from the National Risk Management Research Laboratory (NRMRL) Treatability Database (formerly called the Risk Reduction Engineering Laboratory (RREL) database) to augment the POTW database for the pollutants which the 50–POTW Study did not cover. EPA notes that the 50 POTW Study contains percent removal data for all of the pollutants for which EPA is proposing effluent limitations and pretreatment standards. The RREL database was used to estimate incidental pollutant reductions achieved by the technology for some pollutants that are not being expressly limited. This database provides information, by pollutant, on removals obtained by various treatment technologies. The database provides the user with the specific data source and the industry from which the wastewater was generated. For each pollutant of concern EPA considered for this proposed rule that was not found in the 50–POTW database, EPA used data from the NRMRL database, using only treatment technologies representative of typical POTW secondary treatment operations (activated sludge, activated sludge with filtration, aerated lagoons). EPA further edited these files to include information pertaining only to domestic or industrial wastewater. EPA used pilot-scale and full-scale data only, and eliminated bench-scale data and data from less reliable references. These and other aspects of the methodology used for this proposal are described in Section 7 of the Technical Development Document.

The results of the POTW pass-through analysis for indirect dischargers are discussed in Sections XII.D to XII.K for each subcategory. In addition, Section XIV of today's proposal discusses several issues related to the editing criteria applied to the 50–POTW data base. EPA solicits comments on its pass-through methodology, including the revised editing criteria discussed above as well as the additional issues described in Section XIV and in the record for today's proposal.

B. Overview of Technology Options for PSES

Indirect discharging MP&M facilities generate wastewater with similar pollutant characteristics to direct discharging facilities. Hence, in evaluating technology options for PSES, EPA considered the same ten treatment technologies discussed previously for BPT and BAT. However, as described below, along with the technology options, EPA also evaluated ''low flow'' exclusions for indirect discharging facilities (see Sections II.D and VI for additional discussion on the low flow exclusions).

C. Overview of Low Flow Exclusions

For each subcategory, EPA evaluated various low flow exclusions (also referred to as ''flow cutoffs'') for indirect dischargers. The Agency considered several factors in determining what flow level, if any, is appropriate for excluding facilities from compliance with pretreatment standards. For several of the subcategories, EPA considered the local control authorities' increased burden associated with the development of new permits or other control mechanisms for MP&M facilities. For some subcategories, the Agency considered flow exclusions as a way to reduce economic impacts. EPA also considered the amount of pollutant (in pound-equivalents) discharged per year by the subcategory and by each of the facilities on an average annual basis, in conjunction with the costs of regulation, to identify an appropriate level for an exclusion. In cases where EPA is proposing an option that also specifies a flow cutoff, it means that facilities with annual wastewater flow below the cutoff would not be subject to the MP&M categorical pretreatment standards. These facilities would remain subject to the general pretreatment regulation at 40 CFR part 403 or their existing categorical pretreatment standards (*e.g.,* 40 CFR part 413 or part 433). For the Metal Finishing Job Shops subcategory, although the proposed option does not contain a flow cutoff, several other options with various flow cutoffs are discussed in today's proposal. Some of these options would require excluded facilities to remain covered by categorical pretreatment standards under 40 CFR part 413 (Electroplating) and 40 CFR part 433 (Metal Finishing). In addition, some indirect discharging facilities in the General Metals subcategory that discharge less than 1 MGY will remain covered by the pretreatment standards in 40 CFR part 433. EPA is not proposing pretreatment standards for the Non-Chromium Anodizing subcategory. Therefore, all indirect discharging facilities in this subcategory will remain subject to the applicable pretreatment standards in 40 CFR part 413 or 40 CFR part 433.

In this section, the Agency discusses only some of the flow cutoff options for each subcategory. EPA presents its analysis of a full range of flow cutoff options for indirect dischargers in each subcategory in the Technical Development Document.

Table XII.C–1 below summarizes the pounds of pollutants removed by the proposed options for indirect dischargers in each subcategory, and Table XII.C–2 summarizes the costs and economic impacts associated with the proposed options for indirect dischargers in each subcategory with proposed standards. EPA is not proposing pretreatment standards for the Non-Chromium Anodizing, Railroad Line Maintenance, and Shipbuilding Dry Dock subcategories for the reasons described later in this section. (See Section IX for summary tables for direct dischargers).

TABLE XII.C–1.—ANNUAL POUNDS OF POLLUTANT REMOVED BY THE PROPOSED PSES OPTION FOR INDIRECT DISCHARGERS BY SUBCATEGORY

Subcategory (number of facilities)	Selected option (flow cutoff)	Priority and nonconventional metals (lb-removed/yr)	Priority and nonconventional organics (lb-removed/yr)	Cyanide (lb-removed/yr)
General Metals (3,055)	Option 2 (1 MGY)	28.1 million	7.7 million	284,000.
Metal Finishing Job Shops (1,514).	Option 2	2.4 million	47,000	1 million.
Printed Wiring Boards (621)	Option 2	2.6 million	14,000	230,000.
Steel Forming and Finishing (110).	Option 2	617,000	16,000	181.

TABLE XII.C–1.—ANNUAL POUNDS OF POLLUTANT REMOVED BY THE PROPOSED PSES OPTION FOR INDIRECT DISCHARGERS BY SUBCATEGORY—Continued

Subcategory (number of facilities)	Selected option (flow cutoff)	Priority and nonconventional metals (lb-removed/yr)	Priority and nonconventional organics (lb-removed/yr)	Cyanide (lb-removed/yr)
Oily Waste (226)	Option 6 (2 MGY)	191,000	1.1 million	0.

TABLE XII.C–2.—ANNUAL COSTS AND ECONOMIC IMPACTS OF THE PROPOSED PSES OPTION FOR INDIRECT DISCHARGERS BY SUBCATEGORY

Subcategory (number of facilities)	Selected option (flow cutoff)	Annualized compliance costs for selected option ($1996)	Economic impacts (facility closures) of selected option (percent of regulated subcategory*)
General Metals (3,055)	Option 2 (1 MGY)	1.57 billion	24 (<1%)
Metal Finishing Job Shops (1,514)	Option 2	178 million	128 (10%)
Printed Wiring Boards (621)	Option 2	147 million	7 (1%)
Steel Forming and Finishing (110)	Option 2	24 million	6 (6%)
Oily Waste (226)	Option 6 (2 MGY)	10 million	14 (<1%)

*Baseline closures will not be regulated and, therefore, are not included when estimating the percentage of regulatory closures (% regulatory closures = regulatory closures/all facilities in subcategory excluding baseline closures).

D. General Metals Subcategory

1. Need for PSES

As discussed in Section XII.A, one of the factors that EPA uses to determine the need for pretreatment standards is whether the pollutants discharged by an industry pass through a POTW. The Agency only applied the pass-through analysis to pollutants that it selected for regulation under BAT. For the General Metals subcategory, EPA determined that 13 pollutants pass through; and therefore, EPA is proposing pretreatment standards equivalent to BAT for these pollutants.

2. Selected PSES Options

As discussed in Section XII.B, in the Agency's engineering assessment of the best available technology for pretreatment of wastewater from the General Metals Subcategory, EPA considered the same technology options for PSES as it did for BAT with the additional consideration of a flow cutoff. The Agency is proposing BAT Option 2 with a 1 MGY flow cutoff for PSES. EPA is proposing Option 2 for many of the same reasons it selected that option for BPT and BAT (See Sections IX.A and XI.A) and provides additional rationale below.

EPA determined that Option 2 represented the best available technology and that Option 2 with a 1 MGY flow cutoff was economically achievable and greatly reduced the burden on POTWs. This option results in 24 facility closures (less than 1 percent of the indirect discharging General Metals subcategory population). See Section XVI.E for a discussion on job losses. Additionally, the Agency believes that Option 2 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level. Approximately 15 percent of the indirect discharging facilities in the General Metals subcategory employ chemical precipitation followed by a sedimentation (Option 2) while 1 percent employ microfiltration after chemical precipitation (Option 4).

EPA did evaluate Option 4 with a 1 MGY flow cutoff as a basis for establishing PSES. EPA estimates that the economic impact due to the additional controls at Option 4 levels would result in 92 facility closures (less than 1 percent of the indirect dischargers in this subcategory). See Section XVI.E for a discussion on job losses. While EPA does not have a bright line for determining what level of impact is economically achievable for the industry as a whole, EPA looked for a breakpoint that would mitigate adverse economic impacts without greatly affecting the toxic pound equivalents being removed under the proposed rule. By selecting Option 2 as PSES, EPA was able to reduce facility closures by more than two-thirds, while only losing a little over one percent of the toxic pound equivalents from control under Option 4. The Agency concluded that the additional facility closures associated with Option 4 do not justify the insignificant additional pollutant removals achieved for indirect dischargers in this subcategory.

Considering the large number of indirect dischargers in the General Metals subcategory which have the potential to be covered by this proposed regulation, an important issue to the affected industry and to permit writers is the potentially enormous administrative burden associated with issuing permits or other control mechanisms for all of these facilities. Therefore, in developing this proposal, EPA has looked for means of reducing the administrative burden, reducing monitoring requirements, and reducing reporting requirements. In order to meet this end, the Agency is proposing a 1 million gallon per year (MGY) flow cutoff for the General Metals subcategory. Under this proposed option, facilities in the General Metals subcategory that discharge greater than 1 MGY of MP&M process wastewater would be subject to the proposed categorical pretreatment standards. Facilities in the General Metals subcategory that discharge 1 MGY or less would not be subject to MP&M PSES requirements. However, some of the facilities in this subcategory discharging under 1 MGY are currently covered by 40 CFR part 433, Metal Finishing PSES or PSNS, and these indirect dischargers would remain subject to those pretreatment standards and the general pretreatment standards at 40 CFR part 403.

The Agency determined that the 1 MGY flow cutoff was appropriate for the

General Metals subcategory based on several factors. First, and the most important factor, was the overall size of the General Metals subcategory. EPA estimates that there are over 26,000 indirect discharging facilities in the General Metals subcategory, of which 74 percent are not currently regulated by nationally established effluent guidelines. Establishing an MP&M pretreatment standard for all 26,000 facilities would greatly increase the number of permits or other control mechanisms for which local authorities are responsible. (EPA estimates that there are approximately 30,000 control mechanisms today.) EPA concluded that this increased permit burden was not reasonable and therefore explored potential flow cutoffs as a way to reduce the impact on POTW permitting authorities.

Second, EPA is proposing the 1 MGY flow cutoff for this subcategory based in part on the small number of pound-equivalents that would be removed by facilities with annual wastewater flows less than or equal to 1 MGY. EPA determined that 89 percent of the indirect discharging facilities in the General Metals subcategory discharge less than or equal to 1 MGY, yet these facilities are responsible for less than 6 percent of the total pound-equivalents currently discharged. If the Agency proposed pretreatment standards for facilities in the General Metals subcategory that discharged less than or equal to 1 MGY, it estimates average removals of only 22 pound-equivalents per facility per year for those facilities. EPA recently decided not to promulgate pretreatment standards for two industrial categories, Industrial Laundries (64 FR 45072) and Landfills (65 FR 3008), based on low removals of toxic pound equivalents by facilities in those categories. In the industrial laundries rule, EPA decided not to promulgate pretreatment standards based on 32 toxic pound equivalents per facility per year, and in the landfills effluent guidelines, EPA decided not to promulgate pretreatment standards for non-hazardous landfills based on the removal of only 14 toxic pound equivalents per facility per year. In both instances, the Agency considered that the small additional removals that would be achieved through regulation did not warrant adoption of national categorical standards.

The Agency concluded that regulation of facilities discharging only 22 pound-equivalents per year was not justified by the additional permitting burden associated with these facilities. Although this decision is based upon a subset of small facilities, and not an entire subcategory as was done before, EPA believes this approach would allow Control Authorities to focus their efforts on the facilities discharging the vast majority of the pollutants, rather than dissipating their limited resources on sites contributing much less to the overall problem. EPA acknowledges that this may create an economic advantage for the smaller facilities, and solicits comment on this exclusion.

EPA also closely evaluated Option 2 with a 2 MGY flow cutoff for the General Metals subcategory. The Agency is not proposing this option because it does not reduce the number of facility closures (24) or further reduce the burden on control authorities in a significant way, and there is a significant number of pound equivalents associated with facilities discharging between 1 and 2 MGY. EPA determined that only 3 percent more of the facilities in this subcategory discharge between 1 and 2 MGY. This small number of facilities accounts for an additional 13 percent of the annual pollutant discharge load (in pound-equivalents). If EPA proposed Option 2 with a 2 MGY flow cutoff, the economic impacts would not be reduced. Based on these considerations, EPA is not proposing the 2 MGY flow cutoff for the General Metals subcategory. EPA concluded that the 1 MGY flow cutoff was the most appropriate option in terms of balancing POTW burden reduction with pollutant removals and mitigating economic impacts. Table XII.C–1 above shows the pounds of pollutants removed by the proposed option, and Table XII.C–2 summarizes the costs and economic impacts associated with the proposed option. Where these General Metals facilities discharge less than or equal to 1 MGY to a POTW, these pretreatment standards proposed today do not apply; however, facilities are still subject to other applicable pretreatment standards, including those established under parts 413 and 433. EPA requests comment on the 1 MGY flow cutoff and whether a higher or lower cutoff would be appropriate. EPA also requests comment on whether the flow cutoff should be different for facilities currently covered under 40 CFR part 413 or part 433 and whether or not that would create an unfair economic advantage for those facilities (e.g., captive electroplating shops in General Metals remaining regulated under 40 CFR part 433 but Metal Finishing Job Shops being regulated under the proposed MP&M rule).

3. Calculation of PSES

Based on the results of the pass-through analysis discussed in Section XII.D.1, EPA is proposing pretreatment standards for existing sources in the General Metals subcategory equivalent to those limitations proposed for BAT for the pollutants listed at § 438.15 (as provided in the codified regulation that accompanies this preamble). EPA determined that all of the pollutants listed in § 438.15 (except for Total Sulfide, TOC, and TOP) pass through POTWs. EPA is proposing a limitation for total sulfide based on potential POTW interference or upset associated with discharges of total sulfide from MP&M facilities. EPA is proposing limitations for TOC and TOP as part of a compliance alternative for organic pollutant discharges. (See Section XXI.C. for a discussion of monitoring flexibility.) (See Section XXII.C. for a discussion of monitoring flexibility.)

4. Compliance Date

EPA is proposing to establish a three-year deadline for compliance with PSES. Design and construction of systems adequate for compliance with PSES will be a substantial undertaking for many MP&M sites.

E. Metal Finishing Job Shops Subcategory

1. Need for PSES

As discussed above in Section XII.A., one of the factors that EPA uses to determine the need for pretreatment standards is whether the pollutants discharged by an industry pass through a POTW. The Agency only applies the pass-through analysis to pollutants that it selected for regulation under BAT. For the Metal Finishing Job Shops subcategory, EPA determined that 12 pollutants pass through; and therefore, EPA is proposing pretreatment standards equivalent to BAT for these pollutants.

2. Selected PSES Option

As discussed in Section XII.B, in the Agency's engineering assessment of the best available technology for pretreatment of wastewater from the Metal Finishing Job Shops Subcategory, EPA considered the same technology options for PSES as it did for BAT with the additional consideration of a flow cutoff. The Agency is proposing BAT Option 2 for PSES for many of the same reasons it selected that option for BPT and BAT (See Section IX.B and XI.B) and provides additional rationale below. EPA is proposing that pretreatment standards based on Option 2 be applied to all facilities (i.e., no flow exclusion) for the Metal Finishing Job Shops subcategory.

The Agency estimates that 1,514 metal finishing job shop facilities currently discharge MP&M process wastewater to POTWs. The Agency projects that 128 of these facilities (10 percent of the indirect discharging facilities when baseline closures are taken into consideration) might close as a result of the proposed option (see Section XVI.E for a discussion on job losses). EPA concluded that this level of impact was economically achievable for the subcategory as a whole, but in an effort to minimize the impacts, considered several flow exclusions and compliance alternatives.

The Agency believes that Option 2 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level. Approximately 55 percent of the indirect discharging facilities in the Metal Finishing Job Shops subcategory employ chemical precipitation followed by sedimentation (Option 2) while less than 1 percent employ microfiltration after chemical precipitation (Option 4).

EPA did evaluate Option 4 as a basis for establishing PSES. EPA estimates that the economic impact due to the additional controls at Option 4 levels would result in 393 facility closures (32 percent of the indirect discharging facilities in this subcategory). (See Section XVI.E for a discussion on job losses). Thus, EPA rejected Option 4 as not economically achievable.

The Agency evaluated Option 2 with several levels of flow cutoffs, compliance options, and various combinations of the two. EPA analyzed the cutoffs and alternative compliance options in terms of reduction in economic impacts and quantity of toxic pound-equivalents discharged to the environment. EPA did not consider the reduction in POTW burden for this subcategory, unlike the General Metals subcategory, because EPA has already established PSES for all of the facilities in this subcategory under 40 CFR part 413 and 40 CFR part 433, and local control authorities would not have to develop entirely new permits (or other control mechanisms) for these facilities.

With respect to alternatives, first, EPA analyzed a 1 MGY flow cutoff, which would exclude 831 of the 1,514 estimated metal finishing job shop facilities (or 457 of the 1,231 facilities after baseline closures are removed from the analysis), and would reduce the economic impacts for 23 of the 128 facilities EPA projected would close under Option 2. This represents less than 2 percent of the 1,231 metal finishing jobs that operate in the baseline and 18 percent of the projected facility closures under Option 2. This means that there are still 105 of the 128 facilities that EPA predicts to close with a 1 MGY flow cutoff. Further, EPA determined that the proposed regulation would control an average of 135 pound-equivalents per year from facilities discharging less than 1 MGY. This is higher than the level at which EPA has previously determined that discharges are not significant enough to warrant national regulation. Facilities discharging less than 1 MGY are associated with removals under the proposed option of about 61,000 pound-equivalents (or about 3 percent of the removals associated with the proposed option) at an incremental cost-effectiveness of about $300 per pound-equivalent ($1981). This is higher than has generally been associated with pretreatment standards in the past, though not necessarily higher than has been associated with the smaller facilities regulated with pretreatment standards in the past. This is to be expected since smaller facilities incur the same level of costs for monitoring as larger facilities and are sometimes forced to purchase larger capacity treatment units than they would need due to availability. Nonetheless, the Agency concluded that the pollutant reductions associated with Option 2 were feasible and achievable and the economic impacts were not substantially mitigated under the 1 MGY flow cutoff, so a 1 MGY flow cutoff is not being proposed for the Metal Finishing Job Shops subcategory. EPA requests comment on the use of a flow cutoff for this subcategory.

Second, EPA considered an option with (a) MP&M pretreatment standards for facilities discharging greater than 1 MGY and (b) a pollution prevention alternative for those discharging less than 1 MGY. Under this option, EPA would exclude from the MP&M numeric pretreatment standards based on Option 2 those metal finishing job shops discharging less than 1 MGY that choose to perform the pollution prevention and water conservation activities discussed in Section XXI.D (referred to as the ''P2 alternative''). EPA would require the low flow facilities to continue to meet the pretreatment standards codified at 40 CFR part 433, which remain unchanged by today's proposal. All facilities discharging greater than 1 MGY (and those facilities discharging less than 1 MGY but not choosing the P2 alternative) would be subject to the MP&M pretreatment standards for this subcategory. In analyzing this option, EPA assumed that all facilities discharging less than 1 MGY chose the P2 alternative. EPA's analysis shows that this option would reduce the facility closures for 23 of the 128 facilities EPA projected would close under Option 2 (no flow cutoff). As with the 1 MGY flow cutoff approach discussed above, this represents less than 2 percent of the 1,231 metal finishing jobs that operate in the baseline and about 18% of the closures projected by the proposed option. Further, although the P2 alternative would be somewhat effective in reducing toxic discharges, the option is not as protective as the numeric pretreatment standards based on Option 2. For facilities discharging less than 1 MGY, EPA estimates that the P2 alternative would control 59 pound-equivalents per facility per year (compared to 135 pound-equivalents per facility at Option 2). Thus, EPA is not proposing the option of a 1 MGY flow cutoff combined with a P2 alternative for today's proposal. EPA solicits comment and data on the pollutant reductions that can be achieved using the practices outlined in Section XXI.D.

Third, EPA analyzed a 2 MGY flow cutoff, which would exclude 1,024 facilities (66 percent) from MP&M pretreatment standards. Excluding a larger number of facilities (compared to the 1 MGY cutoff option) resulted in a smaller number of facility closures. For this option, EPA predicts that 59 facilities (approximately 5 percent of the indirect discharging facilities) might close. EPA estimates that the facilities discharging less than 2 MGY represent less than 12 percent of the total pound-equivalents currently discharged by facilities in this subcategory. For facilities discharging less than 2 MGY, EPA estimates that pretreatment standards would remove an average of 189 pound-equivalents per facility per year. While a 2 MGY flow cutoff reduced the number of facility closures, EPA concluded that the pollutant reductions associated with Option 2 were feasible and achievable and is not proposing a 2 MGY flow cutoff. EPA requests comment on the 2 MGY flow cutoff for this subcategory.

Fourth, EPA analyzed the 2 MGY flow cutoff with the pollution prevention alternative for those facilities below the cutoff. Under this option, EPA would exclude from the MP&M numeric pretreatment standards based on Option 2 those metal finishing job shops discharging less than 2 MGY that choose to perform the pollution prevention and water conservation activities discussed in Section XXI.D (*i.e.* the P2 alternative). EPA would require the low flow facilities to continue to meet the

pretreatment standards codified at 40 CFR part 433, which remain unchanged by today's proposal. All facilities discharging greater than 2 MGY (and those facilities discharging less than 2 MGY but not choosing the P2 alternative) would be subject to the MP&M pretreatment standards for this subcategory. In analyzing this option, EPA assumed that all facilities discharging less than 2 MGY chose the P2 alternative. EPA's analysis shows that this option may not reduce the number of facility closures any further than a 1 MGY flow cutoff (or 1 MGY P2 Alternative). The model facilities representing the facilities that close with flows of 2 MGY or less would require annualized costs to be reduced at least 68 percent in order to avoid closure. Since there are some compliance costs associated with implementing the practices of the P2 alternative, EPA estimates that these may close under the P2 Alternative. See Section XVI.E for a discussion on job losses. Although the P2 alternative reduces the number of facility closures as compared to an option with no flow cutoff, the option is not as protective as numeric pretreatment standards based on Option 2. For facilities discharging less than 2 MGY, EPA estimates that the P2 alternative would control an average of 67 pound-equivalents per facility per year (compared to 189 pound-equivalents per facility at Option 2). Thus, EPA is not proposing the option of 2 MGY flow cutoff combined with a P2 alternative. EPA solicits comment and data on the pollutant reductions that can be achieved using the practices outlined in Section XXI.D.

In summary, for all of the flow cutoff and P2 alternatives that EPA considered for this subcategory, the Agency identified no combination that would significantly reduce the economic impacts without also significantly reducing control of pollutants. At all the flow cutoffs and compliance alternatives, EPA concluded that the potential removals the Agency would be choosing to forego were above levels which EPA has previously determined insufficient to warrant national categorical pretreatment standards. Thus, EPA is not proposing a flow cutoff for this subcategory. Under the proposed option, all facilities in this subcategory would be subject to the pretreatment standards, which would reduce pass through of pollutants based on a technology EPA has determined to be technologically feasible and economically achievable. The Agency is soliciting comment on alternatives that might reduce the economic impact and still provide acceptable environmental protection, including all of the options discussed above. See Section XXI.D for a discussion of the P2 alternative and Section XXIII for solicitation of comments on this issue. Table XII.C–1 above shows the pounds of pollutants removed by the proposed option, and Table XII.C–2 summarizes the costs and economic impacts associated with the proposed option.

3. Calculation of PSES

Based on the results of the pass-through analysis discussed in Section XII.E.1., EPA is proposing pretreatment standards for existing sources in the Metal Finishing Job Shops subcategory equivalent to those limitations proposed for BAT for the pollutants listed at § 438.25 (as provided in the codified regulation that accompanies this preamble). EPA determined that all of the pollutants listed in § 438.25 (except for Total Sulfide, TOC, and TOP) pass through POTWs. EPA is proposing a limitation for total sulfide based on potential POTW interference or upset associated with discharges of total sulfide from MP&M facilities. EPA is proposing limitations for TOC and TOP as part of a compliance alternative for organic pollutant discharges. (See Section XXII.C. for a discussion of monitoring flexibility.)

4. Compliance Date

EPA is proposing to establish a three-year deadline for compliance with PSES. Design and construction of systems adequate for compliance with PSES will be a substantial undertaking for many MP&M sites.

F. Non-Chromium Anodizing Subcategory

1. Rationale for Not Proposing PSES

EPA is proposing to not establish PSES for the Non-Chromium Anodizing subcategory based on the economic impacts associated with Option 2 and the small quantity of toxic pollutants discharged by facilities in this subcategory remaining covered at an economically-achievable flow cutoff. EPA determined that 60 percent of the indirect discharging facilities in this subcategory would close as a result of complying with Option 2 based standards. Pretreatment standards for this subcategory based on either Option 2 or Option 4 would require facilities to remove large quantities of aluminum, a metal that is beneficial to POTWs because it assists in the flocculation of wastewater prior to sedimentation. Aluminum anodizers use a large quantity of water in their anodizing processes and produce a wastewater that contains mostly aluminum. If the Agency proposed pretreatment standards for this subcategory, even without regulating aluminum, the standards would require facilities to install very large treatment systems (because of their high flow volume) and would result in the removal of large quantities of aluminum in order to remove small quantities of other metals such as nickel, zinc, and manganese. Therefore, EPA determined that the benefits of the aluminum discharge to POTWs outweighed the benefits gained from the removal of small quantities of other metals. In addition, because EPA has already promulgated pretreatment standards for non-chromium anodizers at 40 CFR parts 413 and 433, there is already a level of control for the small quantities of other metals being discharged along with the aluminum. Facilities subject to this subcategory must still comply with applicable PSES limitations (either 40 CFR part 413 or 40 CFR part 433). 40 CFR 438.40(b).

G. Printed Wiring Board Subcategory

1. Need for PSES

As discussed above in Section XII.A, one of the factors that EPA uses to determine the need for pretreatment standards is whether the pollutants discharged by an industry pass through a POTW. The Agency only applies the pass-through analysis to pollutants that it selected for regulation under BAT. For the Printed Wiring Board subcategory, EPA determined that 9 pollutants pass through; and therefore, EPA is proposing pretreatment standards equivalent to BAT for these pollutants.

2. Selected PSES Option

As discussed in Section XII.B above, in the Agency's engineering assessment of the best available technology for pretreatment of wastewater from the Printed Wiring Board Subcategory, EPA considered the same technology options for PSES as it did for BAT with the additional consideration of a flow cutoff exclusion. The Agency is proposing Option 2 for PSES for many of the same reasons it selected that option for BPT and BAT (See Section IX.D and XI.D) and provides additional rationale below. EPA also determined that pretreatment standards based on Option 2 for all facilities (*i.e.,* no flow exclusion) are appropriate for the Printed Wiring Board subcategory. The Agency estimates that 621 printed wiring board facilities currently discharge MP&M process wastewater to POTWs. The Agency projects that 7 of these facilities (1 percent of the current indirect

discharging population) might close as a result of the MP&M regulation (see Section XVI.E for a discussion on job losses). EPA concluded that this level of impact was economically achievable for the subcategory as a whole, but in an effort to minimize the impacts (and or maintain existing limitations for facilities where potential removals may not be sufficient to warrant national regulation), considered flow exemptions and compliance alternatives.

The Agency believes that Option 2 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level. Approximately 80 percent of the indirect discharging facilities in the Printed Wiring Board subcategory employ chemical precipitation followed by sedimentation (Option 2) while 2 percent employ microfiltration after chemical precipitation (Option 4).

EPA did evaluate Option 4 as a basis for establishing PSES. EPA estimates that the economic impact due to the additional controls at Option 4 levels would result in 18 more facility closures than Option 2 (total of 25 closures). EPA itEPA is not proposing to establish PSES limitations based on Option 4 because it determined that Option 2 achieves nearly equivalent reductions in pound-equivalents for much less cost. By selecting Option 2 as the basis for PSES, EPA reduced annualized compliance costs by $75 million (1996$) while only losing 0.5 percent of the toxic pound equivalents that would be removed under Option 4. The Agency concluded that the additional costs of Option 4 do not justify the additional insignificant amount of pollutant removals achieved for indirect dischargers in this subcategory. Therefore, EPA determined that Option 2 is the ''best available'' technology economically achievable for the Printed Wiring Board subcategory.

Although EPA concluded that the level of economic impact associated with Option 2 with no flow cutoff was economically achievable, it considered flow exclusions in an effort to minimize the impacts and/or maintain existing limitations for facilities where potential removals may not be significant enough to warrant national regulations. EPA did not consider the reduction in POTW burden for this subcategory, unlike the General Metals subcategory, because EPA has already established PSES for all of the facilities in this subcategory under 40 CFR parts 413 and 433, and local control authorities would not have to develop entirely new permits (or other control mechanisms) for these facilities. EPA analyzed a 1 MGY flow cutoff, which would exclude 85 facilities, but would not reduce economic impacts. The same 7 facilities that EPA predicted to close with no flow cutoff are also expected to close with a 1 MGY flow cutoff. EPA determined that the proposed regulation would remove a total of less than 500 pound equivalents from the facilities discharging less than 1 MGY (after removing baseline closures from the analysis), or less than 10 pound-equivalents per facility. The incremental removals beyond current regulations is very small for facilities less than 1 MGY, and therefore EPA will consider the 1 MGY cutoff at final. However, the Agency concluded that the pollutant reductions associated with Option 2 were feasible and achievable, the economic impacts were not mitigated at a 1 MGY flow cutoff for this subcategory, and POTW burden would not be reduced with a flow cutoff, and is thus not proposing a 1 MGY flow cutoff for this subcategory. The Agency solicits comments on a 1 MGY flow cutoff, with the existing regulation applying to facilities under 1 MGY. EPA also solicits comment on the implementation and market consequences of this option. Table XII.C–1 above shows the pounds of pollutants removed by the proposed option, and Table XII.C–2 summarizes the costs and economic impacts associated with the proposed option.

3. Calculation of PSES

Based on the results of the pass-through analysis discussed in Section XII.G.1., EPA is proposing pretreatment standards for existing sources in the Printed Wiring Board subcategory equivalent to those limitations proposed for BAT for the pollutants listed at § 438.45 (as provided in the codified regulation that accompanies this preamble). EPA determined that all of the pollutants listed in § 438.45 (except for Total Sulfide, TOC, and TOP) pass through POTWs. EPA is proposing a limitation for total sulfide based on potential POTW interference or upset associated with discharges of total sulfide from MP&M facilities. EPA is proposing limitations for TOC and TOP as part of a compliance alternative for organic pollutant discharges. (See Section XXI.C for a discussion of monitoring flexibility.)

4. Compliance Date

EPA is proposing to establish a three-year deadline for compliance with PSES. Design and construction of systems adequate for compliance with PSES will be a substantial undertaking for many MP&M sites.

H. Steel Forming and Finishing Subcategory

1. Need for PSES

As discussed above in Section XII.A, one of the factors that EPA uses to determine the need for pretreatment standards is whether the pollutants discharged by an industry pass through a POTW. The Agency only applies the pass-through analysis to pollutants that it selected for regulation under BAT. For the Steel Forming and Finishing subcategory, EPA determined that 13 pollutants pass through; and therefore, EPA is proposing pretreatment standards equivalent to BAT for these pollutants.

2. Selected PSES Option

As discussed in Section XII.B above, in the Agency's engineering assessment of the best available technology for pretreatment of wastewater from the Steel Forming and Finishing Subcategory, EPA considered the same technology options for PSES as it did for BAT with the additional consideration of a flow cutoff exclusion. The Agency is proposing Option 2 for PSES for many of the same reasons it selected that option for BPT and BAT (See Section IX.E and XI.E) and provides additional rationale below. EPA is proposing pretreatment standards based on Option 2 for all facilities (*i.e.,* no flow exclusion) for the Steel Forming and Finishing subcategory.

The Agency estimates that 110 steel forming and finishing facilities currently discharge MP&M process wastewater to POTWs. The Agency projects that 6 of these facilities (6 percent of the current indirect discharging population) might close as a result of the MP&M regulation (see Section XVI.E for a discussion on job losses). EPA concluded that this level of impact was economically achievable for the subcategory as a whole, but in an effort to minimize the impacts, considered flow exemptions and compliance alternatives.

The Agency believes that Option 2 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level. Approximately 63 percent of the indirect discharging facilities in the Steel Forming and Finishing subcategory employ chemical precipitation followed by sedimentation (Option 2) while no facilities employ microfiltration after chemical precipitation (Option 4).

EPA did evaluate Option 4 as a basis for establishing PSES. EPA estimates

that the economic impact due to the additional controls at Option 4 levels would result in the same number of facility closures (6) as Option 2. Therefore, EPA does consider Option 4 to be economically achievable for this subcategory. However, EPA is not proposing to establish PSES limitations based on Option 4 because it determined that Option 2 achieves nearly equivalent reductions in pound-equivalents for much less cost. By selecting Option 2 as the basis for PSES, EPA reduced annualized compliance costs by $12 million (1996$) while only losing 0.6 percent of the toxic pound equivalents that would be removed under Option 4. The Agency concluded that the additional costs of Option 4 do not justify the additional insignificant pollutant removals achieved for indirect discharging facilities in this subcategory. Therefore, EPA determined that Option 2 is the ''best available'' technology economically achievable for the Steel Forming and Finishing subcategory.

Although EPA concluded that the level of economic impact associated with Option 2 with no flow cutoff was economically achievable, it considered flow exclusions in an effort to minimize the impacts. EPA did not consider the reduction in POTW burden for this subcategory, unlike the General Metals subcategory, because EPA has already established PSES for all of the facilities in this subcategory under 40 CFR 420, and local control authorities would not have to develop entirely new permits (or other control mechanisms) for these facilities. However, to mitigate economic impacts (and or maintain existing limitations for facilities where potential removals may not be sufficient to warrant national regulation), EPA analyzed a 1 MGY flow cutoff, which would exclude 21 facilities (after accounting for baseline closures), and a 2 MGY flow cutoff which would exclude 30 facilities. Neither a 1 MGY flow cutoff nor a 2 MGY flow cutoff would reduce economic impacts. The same 6 facilities that EPA predicted to close with no flow cutoff are also expected to close with either a 1 or 2 MGY flow cutoff. However, a 1 MGY flow cutoff would eliminate less than 100 total pound-equivalents that would be removed under the proposed option, or less than 5 pound-equivalents per excluded facility, while a 2 MGY flow cutoff would eliminate less than 200 pound-equivalents total, or less than 7 pound-equivalents per excluded facility. These incremental removals beyond current regulations are very small, and therefore EPA will consider the 1 and 2 MGY cutoffs as final. Although a 3 MGY flow cutoff would reduce projected economic impacts by half (3 projected closures instead of 6), it would eliminate 2,157 pound-equivalent removals, or about 58 pound-equivalents per facility. These incremental removals are nearly twice the removals (on a per facility basis) than would have been realized by regulating industrial laundry and landfill facilities. Because EPA has concluded that the proposed option is feasible and achievable, and POTW burden would not be reduced with a flow cutoff, EPA is not proposing a flow cutoff for the Steel Forming and Finishing subcategory. However, EPA solicits comment on flow cutoffs at the 1, 2, and 3 MGY levels. Under these scenarios, existing regulations in 40 CFR part 420 would continue to apply to the excluded facilities. Unlike the facilities in the Metal Finishing Job Shops or Printed Wiring Board subcategories, the facilities in the MP&M Steel Forming & Finishing subcategory are covered in their current regulations as parts of several subcategories, thus creating problems for control authorities in implementing the appropriate requirements. EPA solicits comment on implementation and market consequences of these options. Table XII.C–1 above shows the pounds of pollutants removed by the proposed option, and Table XII.C–2 summarizes the costs and economic impacts associated with the proposed option.

3. Calculation of PSES

Based on the results of the pass-through analysis discussed in Section XII.H.1., EPA is proposing pretreatment standards for existing sources in the Steel Forming and Finishing subcategory equivalent to those limitations proposed for BAT for the pollutants listed at § 438.55 (as provided in the codified regulation that accompanies this preamble). EPA determined that all of the pollutants listed in § 438.55 (except for Total Sulfide, TOC, and TOP) pass through POTWs. EPA is proposing a limitation for total sulfide based on potential POTW interference or upset associated with discharges of total sulfide from MP&M facilities. EPA is proposing limitations for TOC and TOP as part of a compliance alternative for organic pollutant discharges. (See Section XXI.C for a discussion of monitoring flexibility.)

4. Compliance Date

EPA is proposing to establish a three-year deadline for compliance with PSES. Design and construction of systems adequate for compliance with PSES will be a substantial undertaking for many MP&M sites.

I. Oily Wastes Subcategory

1. Need for PSES

As discussed in Section XII.A, two of the factors that EPA uses to determine the need for pretreatment standards is whether the pollutants discharged by an industry pass through or interfere with a POTW. For the Oily Wastes subcategory, EPA is proposing pretreatment standards equivalent to BAT for the following three pollutants or pollutant parameters: TOC, TOP and total sulfide.

2. Selected PSES Option

As discussed in Section XII.B, in the Agency's engineering assessment of the best available technology for pretreatment of wastewater from the Oily Wastes Subcategory, EPA considered the same technology options for PSES as it did for BAT with the additional consideration of a flow cutoff exclusion. The Agency is proposing BAT Option 6 with a 2 MGY flow cutoff for PSES. The Agency is proposing Option 6 for PSES for many of the same reasons it selected that option for BPT and BAT (See Section IX.F and XI.F) and provides additional rationale below. EPA is proposing the 2 MGY flow cutoff primarily to reduce the burden on POTWs, and solicits comment on a 3 MGY cutoff as a possible alternative to further reduce impacts.

EPA determined that Option 6 represented the best available technology and that Option 6 with a 2 MGY flow cutoff was economically achievable and greatly reduced the burden on POTWs. This option results in 14 facility closures (less than 1 percent of the indirect discharging Oily Wastes subcategory population). See Section XVI.E for a discussion on job losses. Additionally, the Agency believes that Option 6 represents the ''best available'' technology as it achieves a high level of pollutant control, treating all priority pollutants to very low levels, often at or near the analytical minimum level. According to EPA's detailed questionnaires, approximately 44 percent of the indirect discharging facilities in the Oily Wastes subcategory employ oil-water separation by chemical emulsion breaking followed by gravity separation and oil skimming (Option 6) while no facilities employ ultrafiltration (Option 8).

EPA did evaluate BPT Option 8 with a 2 MGY flow cutoff as a basis for establishing PSES more stringent than the level of control being proposed

today. EPA estimates that the economic impact due to the additional controls at Option 8 levels would result in the same number of facility closures (14) as Option 6. Therefore, EPA does consider Option 8 to be economically achievable for this subcategory. However, based on the available data base, EPA is not proposing to establish PSES limitations based on Option 8 because it removes fewer pound-equivalents than Option 6. Therefore, the Agency determined that Option 6 is the ''best available'' technology economically achievable for the removal of priority pollutants from wastewater generated at Oily Wastes subcategory facilities.

Considering the large number of indirect dischargers which have the potential to be covered by this proposed regulation, an important issue to the affected industry and to permit writers is the potentially enormous administrative burden associated with issuing permits or other control mechanisms for all these facilities. Therefore, in developing this proposal, EPA has looked for means of reducing the administrative burden, reducing monitoring requirements, and reducing reporting requirements. In order to meet this end, the Agency is proposing a 2 MGY flow cutoff for the Oily Wastes subcategory. Under this proposed option, facilities in the Oily Wastes subcategory that discharge greater than 2 MGY per year of MP&M process wastewater would be subject to the proposed pretreatment standards. However, those facilities in the Oily Wastes subcategory that discharge 2 MGY or less would not be subject to MP&M PSES requirements. These facilities would, however, remain subject to the existing general pretreatment standards at 40 CFR Part 403.

The Agency is proposing the 2 MGY flow cutoff exclusion for the Oily Wastes subcategory based on several factors. First, and the most important factor, was the overall size of the Oily Wastes subcategory. EPA estimates that there are approximately 28,500 indirect discharging facilities in the Oily Wastes subcategory, of which over 99 percent are not currently regulated by categorical pretreatment standards. Establishing an MP&M pretreatment standard for all 28,500 facilities would nearly double the number of permits that local authorities are currently responsible for. EPA concluded that this increased permit burden was not reasonable given the projected loadings reductions and therefore explored potential flow cutoffs as a way to reduce the impact on POTW permitting authorities.

Second, EPA is proposing the 2 MGY flow cutoff for this subcategory based in part on the small number of pound-equivalents that would be removed by facilities with annual wastewater flows less than or equal to 2 MGY. EPA determined that after removing facilities that close in the baseline (''baseline closures'') from the analysis, over 99 percent of the indirect discharging facilities in the Oily Wastes subcategory discharge less than or equal to 2 MGY. EPA estimates average removals of only 2 pound-equivalents per facility per year for these facilities.

In addition, EPA determined that for those facilities in this subcategory that discharge between 1 and 2 MGY the MP&M regulation would remove an average of 31 pound-equivalents per year per facility. These reductions, as discussed previously, are lower than those projected for industrial laundries and landfills, for which EPA determined national regulation was not warranted. The Agency concluded that regulation of facilities discharging only 2 pound-equivalents per year (with those discharging between 1 and 2 MGY at 31 pound-equivalents per year) was not justified by the additional permitting burden associated with these facilities. EPA believes this approach would allow Control Authorities to focus their efforts on the facilities discharging the vast majority of the pollutants, rather than dissipating their limited resources on sites contributing much less to the overall problem. EPA does note, however, that the indirect discharging facilities that discharge less than or equal to 2 MGY are responsible for an estimated 78 percent of the total pound-equivalents currently discharged (approximately 51,000 of the 65,000 pound-equivalents discharged after removing baseline closures from the analysis).

EPA also closely evaluated Option 6 with a 3 MGY flow cutoff for the Oily Waste subcategory. Based on EPA's data collection efforts, after removing facilities that close in the baseline (''baseline closures'') from the analysis, over 99 percent of the indirect discharging facilities in the Oily Wastes subcategory discharge less than or equal to 3 MGY. The Agency determined that after removing baseline closures from the analysis there are approximately 64 indirect discharge facilities in this subcategory between 2 and 3 MGY and that they discharge an average of 24 pound-equivalents per year per facility. If EPA proposed Option 2 with a 3 MGY flow cutoff, the economic impacts would decrease slightly (12 facility closures rather than 14 at the proposed option). The Agency concluded that the 3 MGY flow cutoff was not necessary to reduce POTW burden for the Oily Wastes subcategory although it would reduce the economic impact somewhat. EPA solicits comment on a 3 MGY cutoff, but notes that these approximately 28,160 facilities are responsible for an estimated 81 percent of the total pound-equivalents currently discharged (approximately 52,500 of the 65,000 pound-equivalents discharged after removing baseline closures from the analysis).

Therefore, EPA is proposing the 2 MGY flow cutoff but is also seriously considering a 3 MGY cutoff. EPA believes this approach would allow Control Authorities to focus their efforts on the facilities discharging the vast majority of the pollutants, rather than dissipating their limited resources on sites contributing much less to the overall problem. Table XII.C–1 above shows the pounds of pollutants removed by the proposed option, and Table XII.C–2 summarizes the costs and economic impacts associated with the proposed option (both tables include facilities that close in the baseline). EPA's methodology for identifying baseline closures is discussed in Section XVI.

3. Calculation of PSES

Based on the results of the pass-through analysis discussed in Section XII.I.1., EPA is proposing pretreatment standards for existing sources in the Oily Wastes subcategory equivalent to those limitations proposed for BAT for the pollutants listed at § 438.65 (as provided in the codified regulation that accompanies this preamble). EPA is proposing a pretreatment standard for total sulfide based on potential POTW interference or upset associated with discharges of total sulfide from MP&M facilities. EPA is proposing pretreatment standards for TOC and TOP as part of a compliance alternative for organic pollutant discharges. (See Section XXI.C for a discussion of monitoring flexibility.)

4. Compliance Date

EPA is proposing to establish a three-year deadline for compliance with PSES. Design and construction of systems adequate for compliance with PSES will be a substantial undertaking for many MP&M sites.

J. Railroad Line Maintenance Subcategory

1. Rationale for Not Proposing PSES

EPA is proposing to not establish PSES for the Railroad Line Maintenance subcategory based on the small quantity

of toxic pollutants discharged by facilities in this subcategory. The Agency estimates that there are 799 indirect discharging railroad line maintenance facilities that currently discharge 1,800 pound-equivalents per year to our nation's waters (taking into account removals at the POTW), or just over 2 pound-equivalents per facility per year. Based on this analysis, EPA preliminarily concluded that there is no need to develop nationally applicable regulations for this subcategory due to the low levels of pollutants discharged by facilities in this subcategory.

K. Shipbuilding Dry Dock Subcategory

1. Rationale for Not Proposing PSES

EPA is proposing to not establish PSES for the Shipbuilding Dry Dock subcategory based on the small number of facilities in this subcategory and on the small quantity of toxic pollutants removed by the technology options evaluated by EPA for this proposal. The Agency estimates that there are 6 indirect discharging facilities that have one or more dry docks that currently discharge 852 pound-equivalents per year to our nation's waters (taking into account removals at the POTW). On a national basis, Option 8 (ultrafiltration + P2) removed less than 1 pound-equivalent per year while Option 10 (DAF plus P2) only removed 26 pound-equivalents per year (or less than 5 pound-equivalents removed per facility per year). The Agency estimates that all of these facilities currently have DAF treatment in place. EPA determined that nationally-applicable regulations are unnecessary at this time because of the small number of facilities in this subcategory and based on the small amount of toxic pounds removed by the technology options evaluated by the Agency. The Agency believes that pretreatment local limits implemented on a case-by-case basis can more appropriately address any individual toxic parameters present at these six facilities.

XIII. New Source Performance Standards (NSPS) and Pretreatment Standards for New Sources (PSNS)

Section 307(c) of the Act calls for EPA to promulgate pretreatment standards for new sources (PSNS) at the same time that it promulgates new source performance standards (NSPS). New facilities have the opportunity to incorporate the best available demonstrated technologies including process changes, in-plant controls, and end-of-pipe treatment technologies.

The same technologies discussed previously for BAT and PSES are available as the basis for NSPS and PSNS. Since new sites have the potential to install pollution prevention and pollution control technologies more cost effectively then existing sources, EPA strongly considered the more advanced treatment options for NSPS and PSNS. The Agency discusses its analysis of these more stringent options for NSPS and PSNS on a subcategory-by-subcategory basis below.

A. NSPS for the General Metals Subcategory

1. Need for NSPS

EPA expects that new facilities in the General Metals subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for NSPS regulation is the same as the need for BPT regulation. (See Section IX.A.1).

2. Selected NSPS Option

EPA is proposing New Source Performance Standards for this subcategory based on BAT Option 4. The Agency determined that Option 4 is the best available demonstrated technology for the removal of pollutants in this subcategory. EPA's analytical data shows that Option 4 is capable of achieving much lower long-term averages than Option 2 for several of the metal pollutants of concern. In addition, EPA's data shows that microfiltration greatly reduces the variability in the concentration of the metal pollutants in the treatment effluent. Although Option 4 costs $54,500 (1996$) more than Option 2 annually for a new facility with a wastewater flow of 1.1 MGY (the wastewater flow for a representative direct discharging facility in the General Metals subcategory), EPA is proposing Option 4 because of the lower levels of metal pollutants in the wastewater effluent. EPA noted in the discussion of its consideration of this technology for BPT/BAT that it is not being proposed for BPT because the additional removals, while large when considered across the entire population of existing facilities, were not significant on a per facility basis, and because of concerns with potential increased loadings (relative to Option 2) of COD and organic pollutants. EPA requests comment on basing NSPS on Option 2 for the same reasons it is proposing to base BPT/BAT on Option 2.

The Agency also strongly considered proposing NSPS based on ultrafiltration for oil and grease removal and chemical precipitation followed by sedimentation for TSS and metals removal. This option is equivalent to BAT Option 2 with the oil/water separator replaced by an ultrafilter. The Agency is soliciting comment and data on this NSPS option for the final rule.

3. Calculation of NSPS Limitations

The Agency is proposing NSPS limitations for all of the pollutants that it proposed BPT and BAT limitations for in this subcategory. The NSPS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.16. (See Section XXI.C. for a discussion of monitoring flexibility.) EPA based these proposed regulations on EPA sampling episodes at four facilities that employed Option 4 technologies. Three of the four facilities are General Metals facilities while the fourth is a printed wiring board manufacturer. The Agency used the same statistical methods for determining the effluent limitations for NSPS as it described in Section VIII. Because of the limited number of facilities that EPA has analytical sampling data on for Option 4, the Agency is soliciting comment and data on Option 4 technologies. Specifically, the Agency is interested in wastewater treatment data from MP&M facilities employing Option 4 technologies (ultrafiltration for oil and grease removal and microfiltration following chemical precipitation for removal of TSS and metals). See Section XXIII ''Solicitation of Comments.''

4. NSPS Analysis

The Agency also performed an economic analysis in order to determine if Option 4 presented a barrier to entry for new facilities in the General Metals subcategory. EPA determined that the cost of compliance with NSPS based on Option 4 would make up only 0.04 percent of a new facility's projected revenues. Therefore, EPA concluded that NSPS based on Option 4 would not create a barrier to entry.

B. PSNS for the General Metals Subcategory

1. Need for PSNS

EPA expects that new facilities in the General Metals subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for PSNS regulation is the same as the need for PSES regulation. (See Section XII.D.1).

2. Selected PSNS Option

EPA is proposing Pretreatment Standards for New Sources for this subcategory based on BAT Option 4 for the same reasons it is proposing this option for NSPS. EPA is also requesting comment on basing PSNS on Option 2, as with NSPS. In addition, EPA is

proposing a 1 MGY flow cutoff exclusion for PSNS. This is the same flow cutoff level that EPA is proposing for PSES for the existing indirect discharging facilities in the General Metals subcategory. The Agency concluded that a 1 MGY flow cutoff is appropriate for new indirect discharging facilities in the General Metals subcategory based on the potential POTW permitting burden that would be associated with developing and then maintaining permits for new sources with low flows and the likelihood that these facilities discharge a small amount of pound-equivalents at these low flow rates. The Agency assumes that the pound-equivalents removed per facility for new facilities with flows below or equal to 1 MGY would be even lower than the 22 pound-equivalents per facility for similarly sized existing sources in this subcategory. The Agency concluded that a similar (or even smaller) amount of pollutant removal is not significant and does not justify regulation of these facilities by a national categorical regulation. EPA solicits comment on whether it is appropriate to exclude new sources that discharge process wastewater equal to 1 million gallons or less for the reasons described above.

The Agency also strongly considered proposing PSNS based on ultrafiltration for oil and grease removal and chemical precipitation followed by sedimentation for TSS and metals removal. This option is equivalent to BAT Option 2 with the oil/water separator replaced by an ultrafilter. The Agency is soliciting comment and data on this PSNS option for the final rule.

3. Calculation of PSNS Limitations

The Agency is proposing PSNS limitations for the same pollutants that it proposed PSES regulations. The PSNS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.17. EPA determined that all of the pollutants listed in § 438.17 (except for Total Sulfide, TOC, and TOP) pass through POTWs. EPA is proposing a limitation for total sulfide based on potential POTW interference or upset associated with discharges of total sulfide from MP&M facilities. EPA is proposing limitations for TOC and TOP as part of a compliance alternative for organic pollutant discharges. (See Section XXI.C. for a discussion of monitoring flexibility.) The Agency based these proposed limitations on the same four EPA sampling episodes that EPA discussed in Section XIII.A.3.

4. PSNS Analysis

Like NSPS, the Agency determined that the cost of compliance with PSNS based on Option 4 would make up only 0.09 percent of a new facility's projected revenues and concluded that this would not create a barrier to entry.

C. NSPS for the Metal Finishing Job Shops Subcategory

1. Need for NSPS

EPA expects that new facilities in the Metal Finishing Job Shops subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for NSPS regulation is the same as the need for BPT regulation. (See Section IX.B.1).

2. Selected NSPS Option

EPA is proposing New Source Performance Standards for this subcategory based on BAT Option 4. The Agency determined that Option 4 is the best available demonstrated technology for the removal of pollutants in this subcategory. EPA's analytical data shows that Option 4 is capable of achieving much lower long term averages than Option 2 for several of the metal pollutants of concern. In addition, EPA's data shows that microfiltration greatly reduces the variability in the concentration of the metal pollutants in the treatment effluent. Although Option 4 costs $72,500 (1996$) more than Option 2 annually for a new facility with a wastewater flow of 6.0 MGY (the wastewater flow for a representative direct discharging facility in the Metal Finishing Job Shops), EPA is proposing Option 4 because of the lower levels of metal pollutants in the treated wastewater effluent. EPA is not proposing Option 4 for BPT for this subcategory because of the lack of significant overall pollutant removals achieved, and the fact that it removes less COD, O&G, and organic pollutants. EPA requests comment on using Option 2 as the basis for NSPS.

The Agency also strongly considered proposing NSPS based on ultrafiltration for oil and grease removal and chemical precipitation followed by sedimentation for TSS and metals removal. This option is equivalent to BAT Option 2 with the oil/water separator replaced by an ultrafilter. The Agency is soliciting comment and data on this NSPS option for the final rule.

3. Calculation of NSPS Limitations

The Agency is proposing NSPS limitations for all of the pollutants that it proposed BPT and BAT limitations for in this subcategory. The NSPS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.26. (See Section XXI.C for a discussion of monitoring flexibility.) EPA based these proposed regulations on the same four EPA sampling episodes that it used to calculate NSPS for the General Metals subcategory. See Section XIII.A.

4. NSPS Analysis

The Agency also performed an economic analysis in order to determine if Option 4 presented a barrier to entry for new facilities in the Metal Finishing subcategory. EPA determined that the cost of compliance with NSPS based on Option 4 would make up only 1.41 percent of a new facility's projected revenues. Therefore, EPA concluded that NSPS based on Option 4 would not create a barrier to entry.

D. PSNS for the Metal Finishing Job Shops Subcategory

1. Need for PSNS

EPA expects that new facilities in the Metal Finishing Job Shops subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for PSNS regulation is the same as the need for PSES regulation. (See Section XII.E.1).

2. Selected PSNS Option

EPA is proposing Pretreatment Standards for New Sources for this subcategory based on BAT Option 4 for the same reasons it is proposing this option for NSPS. EPA is also requesting comment on PSNS limits based on Option 2. In addition, EPA is not proposing a flow cutoff exclusion for PSNS for this subcategory for the same reasons that it did not propose a flow cutoff for PSES, but is requesting comment on flow cutoffs of 1 and 2 MGY, as with PSES. (See Section XII.E.)

The Agency also strongly considered proposing PSNS based on ultrafiltration for oil and grease removal and chemical precipitation followed by sedimentation for TSS and metals removal. This option is equivalent to BAT Option 2 with the oil/water separator replaced by an ultrafilter. The Agency is soliciting comment and data on this PSNS option for the final rule.

3. Calculation of PSNS Limitations

The Agency is proposing PSNS limitations for the same pollutants that it proposed PSES regulations. The PSNS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.27. EPA determined that all of the pollutants listed in § 438.27 (except for Total Sulfide, TOC, and TOP) pass through POTWs. EPA is proposing a

limitation for total sulfide based on potential POTW interference or upset associated with discharges of total sulfide from facilities in this subcategory. EPA is proposing limitations for TOC and TOP as part of a compliance alternative for organic pollutant discharges. (See Section XXI.C for a discussion of monitoring flexibility.) The Agency based these proposed limitations on the same four EPA sampling episodes that EPA discussed in Section XIII.A.3.

4. PSNS Analysis

Like NSPS, the Agency determined that the cost of compliance with PSNS based on Option 4 would make up 4.64 percent of a new facility's projected revenues and expects that this would not create a barrier to entry. EPA notes that this is a higher percentage than for other subcategories and solicits comment on whether EPA should consider Option 2 for these facilities.

E. NSPS for the Non-Chromium Anodizing Subcategory

1. Need for NSPS

EPA expects that new facilities in the Non-Chromium Anodizing subcategory will discharge similar quantities of the same pollutants that existing sources discharge. EPA notes that it did not identify any existing direct dischargers in this subcategory and that estimates of costs and pollutant loadings were transferred from the best performing indirect dischargers in this subcategory (see Section IX.C). Therefore, the need for NSPS regulation is the same as the need for BPT regulation. (See Section IX.C.1).

2. Selected NSPS Option

EPA is proposing New Source Performance Standards for this subcategory based on BAT Option 2. As discussed in the BPT analysis for this subcategory, non-chromium anodizers discharge large quantities of aluminum but have very low levels of other metals in their wastewater. EPA determined that Option 2 is capable of removing most of the aluminum discharged by facilities in this subcategory and that any additional removals achieved by Option 4 are not justified by the additional cost.

The Agency also evaluated not proposing NSPS for facilities in this subcategory and instead continuing to require compliance with NSPS limitations established under 40 CFR part 433. However, the Agency has tentatively rejected this option because these new proposed NSPS limitations require an increased removal of TSS and the Agency feels that the pollutants proposed for regulation here are more appropriate for the non-chromium anodizing industry. The NSPS limitations established in 40 CFR part 433 require facilities to meet an average monthly discharge of 31 mg/L of TSS and allow for a maximum daily discharge of 60 mg/L. These proposed MP&M limitations require non-chromium anodizers to meet an average monthly discharge for TSS of 22 mg/L and allow for a monthly maximum discharge of 52 mg/L. EPA believes that the costs associated with NSPS are justified by the additional removal of TSS from this subcategory. In addition, 40 CFR part 433 requires non-chromium anodizers to meet effluent limitations for 7 metal pollutants. EPA's data show that these seven metals are present only in very small quantities at non-chromium anodizing facilities. In 40 CFR part 433, EPA did not establish a limit for aluminum, the metal found in the largest quantity in non-chromium anodizers' wastewater. The Agency has determined that direct discharging facilities in the Non-Chromium Anodizing subcategory should have a limit for aluminum and thus is proposing to cover them here. The Agency notes that this will reduce the number of pollutants that non-chromium anodizers would have to monitor for.

3. Calculation of NSPS Limitations

The Agency is proposing NSPS limitations for all of the pollutants that it proposed BPT and BAT limitations for in this subcategory. The NSPS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.36. (See Section XXI.C for a discussion of monitoring flexibility.)

4. NSPS Analysis

A barrier to entry analysis is typically performed for new facilities by using existing facilities as a model. However, there are no existing direct dischargers in this subcategory. Therefore, the Agency could not perform an economic analysis in order to determine if Option 2 presented a barrier to entry for new facilities in the Non-Chromium Anodizing subcategory.

F. PSNS for the Non-Chromium Anodizing Subcategory

1. Need for PSNS

EPA expects that new facilities in the Non-Chromium Anodizing subcategory will discharge similar quantities of the same pollutants that existing sources discharge and therefore EPA is not proposing pretreatment standards for new sources for this subcategory for the same reasons it is not proposing PSES for this subcategory. See Section XII.F and VI.C.3.

G. NSPS for the Printed Wiring Board Subcategory

1. Need for NSPS

EPA expects that new facilities in the Printed Wiring Board subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for NSPS regulation is the same as the need for BPT regulation. (See Section IX.D.1).

2. Selected NSPS Option

EPA is proposing New Source Performance Standards for this subcategory based on BAT Option 4. The Agency determined that Option 4 is the best available demonstrated technology for the removal of pollutants in this subcategory. EPA's analytical data shows that Option 4 is capable of achieving much lower long term averages than Option 2 for several of the metal pollutants of concern. In addition, EPA's data shows that microfiltration greatly reduces the variability in the concentration of the metal pollutants in the treatment effluent. Although Option 4 costs $162,000 more than Option 2 annually for a new facility with a wastewater flow of 25.5 MGY (the wastewater flow for a representative direct discharging facility in the Printed Wiring Board subcategory), EPA is proposing Option 4 because of the lower levels of metal pollutants in the wastewater effluent. EPA is not proposing Option 4 for BPT/BAT because of the lack of significant overall additional removals and the fact that it removes less COD, O&G, and organic pollutants, relative to Option 2. EPA also requests comment on basing NSPS on Option 2.

The Agency also strongly considered proposing NSPS based on ultrafiltration for oil and grease removal and chemical precipitation followed by sedimentation for TSS and metals removal. This option is equivalent to BAT Option 2 with the oil/water separator replaced by an ultrafilter. The Agency is soliciting comment and data on this NSPS option for the final rule.

3. Calculation of NSPS Limitations

The Agency is proposing NSPS limitations for all of the pollutants that it proposed BPT and BAT limitations for in this subcategory. The NSPS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.46.

(See Section XXI.C for a discussion of monitoring flexibility.) EPA based these proposed regulations on the same four EPA sampling episodes that it used to calculate NSPS for the General Metals subcategory. (See Section XIII.A.3). As mentioned above, EPA collected analytical wastewater treatment data from a printed wiring board manufacturer that employed this technology.

4. NSPS Analysis

The Agency also performed an economic analysis in order to determine if Option 4 presented a barrier to entry for new facilities in the Printed Wiring Board subcategory. EPA determined that the cost of compliance with NSPS based on Option 4 would make up only 0.02 percent of a new facility's projected revenues. Therefore, EPA concluded that NSPS based on Option 4 would not create a barrier to entry.

H. PSNS for the Printed Wiring Board Subcategory

1. Need for PSNS

EPA expects that new facilities in the Printed Wiring Board subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for PSNS regulation is the same as the need for PSES regulation. (See Section XII.G.1).

2. Selected PSNS Option

EPA is proposing Pretreatment Standards for New Sources for this subcategory based on BAT Option 4 for the same reasons it is proposing this option for NSPS. It is also requesting comment on PSNS based on Option 2. As was the case for PSES, EPA is not proposing a flow cutoff exclusion for this subcategory for the same reasons discussed in Section XII.G.2, but is requesting comment on a flow cutoff of 1 MGY , as with PSES.

The Agency also strongly considered proposing PSNS based on ultrafiltration for oil and grease removal and chemical precipitation followed by sedimentation for TSS and metals removal. This option is equivalent to BAT Option 2 with the oil/water separator replaced by an ultrafilter. The Agency is soliciting comment and data on this PSNS option for the final rule.

3. Calculation of PSNS Limitations

The Agency is proposing PSNS limitations for the same pollutants that it proposed PSES regulations. The PSNS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.47. EPA determined that all of the pollutants listed in § 438.47 (except for Total Sulfide, TOC, and TOP) pass through POTWs. EPA is proposing a limitation for total sulfide based on potential POTW interference or upset associated with discharges of total sulfide from facilities in this subcategory. EPA is proposing limitations for TOC and TOP as part of a compliance alternative for organic pollutant discharges. (See Section XXI.C for a discussion of monitoring flexibility.) EPA determined that all of these pollutants pass through POTWs. The Agency based these proposed limitations on the same four EPA sampling episodes that EPA discussed in Section XIII.A.3. As mentioned above, EPA collected analytical wastewater treatment data from a printed wiring board manufacturer that employed this technology.

4. PSNS Analysis

Like NSPS, the Agency determined that the cost of compliance with PSNS based on Option 4 would make up only 0.20 percent of a new facility's projected revenues and concluded that this would not create a barrier to entry.

I. NSPS for the Steel Forming and Finishing Subcategory

1. Need for NSPS

EPA expects that new facilities in the Steel Forming and Finishing subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for NSPS regulation is the same as the need for BPT regulation. (See Section IX.E.1).

2. Selected NSPS Option

EPA is proposing New Source Performance Standards for this subcategory based on BAT Option 4. The Agency determined that Option 4 is the best available demonstrated technology for the removal of pollutants in this subcategory. EPA's analytical data shows that Option 4 is capable of achieving much lower long-term averages than Option 2 for several of the metal pollutants of concern. In addition, EPA's data shows that microfiltration greatly reduces the variability in the concentration of the metal pollutants in the treatment effluent. Although Option 4 costs $42,400 more than Option 2 annually for a new facility with a wastewater flow of 18.4 MGY (the wastewater flow for a representative direct discharging facilities in the Steel Forming and Finishing subcategory), EPA determined that the additional cost of Option 4 are justified by the lower levels of metal pollutants in the wastewater effluent.

The Agency also strongly considered proposing NSPS based on ultrafiltration for oil and grease removal and chemical precipitation followed by a clarifier for TSS and metals removal. This option is equivalent to BAT Option 2 with the oil/water separator replaced by an ultrafilter. The Agency is soliciting comment and data on this NSPS option for the final rule.

3. Calculation of NSPS Limitations

The Agency is proposing NSPS limitations for all of the pollutants that it proposed BPT and BAT limitations for in this subcategory. The NSPS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.56. (See Section XXI.C for a discussion of monitoring flexibility.) The Agency based these proposed limitations on the same four EPA sampling episodes that EPA discussed in Section XIII.A.3.

4. NSPS Analysis

The Agency also performed an economic analysis in order to determine if Option 4 presented a barrier to entry for new facilities in the Steel Forming and Finishing subcategory. EPA determined that the cost of compliance with NSPS based on Option 4 would make up only 0.14 percent of a new facility's projected revenues. Therefore, EPA concluded that NSPS based on Option 4 would not create a barrier to entry.

J. PSNS for the Steel Forming and Finishing Subcategory

1. Need for PSNS

EPA expects that new facilities in the Steel Forming and Finishing subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for PSNS regulation is the same as the need for PSES regulation. (See Section XII.H.1).

2. Selected PSNS Option

EPA is proposing Pretreatment Standards for New Sources for this subcategory based on BAT Option 4 for the same reasons it is proposing this option for NSPS. In addition, EPA is not proposing a flow cutoff exclusion for PSNS for this subcategory for the same reasons that it did not propose a flow cutoff for PSES, but is requesting comment on flow cutoffs of 1, 2, and 3 MGY as with PSES. (See Section XII.H.)

The Agency also strongly considered proposing PSNS based on ultrafiltration for oil and grease removal and chemical precipitation followed by sedimentation for TSS and metals removal. This option is equivalent to BAT Option 2 with the

oil/water separator replaced by an ultrafilter. The Agency is soliciting comment and data on this PSNS option for the final rule.

3. Calculation of PSNS Limitations

The Agency is proposing PSNS limitations for the same pollutants that it proposed PSES regulations. The PSNS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.57. EPA determined that all of the pollutants listed in § 438.57 (except for Total Sulfide, TOC, and TOP) pass through POTWs. EPA is proposing a limitation for total sulfide based on potential POTW interference or upset associated with discharges of total sulfide from facilities in this subcategory. EPA is proposing limitations for TOC and TOP as part of a compliance alternative for organic pollutant discharges. (See Section XXI.C for a discussion of monitoring flexibility.) The Agency based these proposed limitations on the same four EPA sampling episodes that EPA discussed in Section XIII.A.3.

4. PSNS Analysis

Like NSPS, the Agency determined that the cost of compliance with PSNS based on Option 4 would make up only 0.17 percent of a new facility's projected revenues and concluded that this would not create a barrier to entry.

K. NSPS for the Oily Wastes Subcategory

1. Need for NSPS

EPA expects that new facilities in the Oily Wastes subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for NSPS regulation is the same as the need for BPT regulation. (See Section IX.F.1).

2. Selected NSPS Option

EPA is proposing New Source Performance Standards for this subcategory based on BAT Option 6, oil-water separation by chemical emulsion breaking, gravity separation, and oil skimming. The Agency determined that Option 6 is the best available demonstrated technology for the removal of pollutants in this subcategory and is proposing this option for the same reasons it selected this option for BPT and BAT. (See Section IX.F.2).

3. Calculation of NSPS Limitations

The Agency is proposing NSPS limitations equivalent to those proposed for BPT for this subcategory. The NSPS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.66. (See Section XXI.C for a discussion of monitoring flexibility.)

4. NSPS Analysis

Since EPA is proposing to set NSPS equal to BAT (Option 6) and this option is determined to be economically-achievable for these facilities under BAT, EPA concluded that NSPS based on Option 6 would not create a barrier to entry.

L. PSNS for the Oily Wastes Subcategory

1. Need for PSNS

EPA expects that new facilities in the Oily Wastes subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for PSNS regulation is the same as the need for PSES regulation. (See Section XII.I.1).

2. Selected PSNS Option

EPA is proposing Pretreatment Standards for New Sources for this subcategory based on BAT Option 6 for the same reasons it is proposing this option for NSPS. In addition, EPA is proposing a 2 MGY flow cutoff exclusion for PSNS with serious consideration of a 3 MGY flow cutoff as well. This is the same flow cutoff level that EPA is proposing for PSES for the existing indirect discharging facilities in the Oily Wastes subcategory. The Agency is proposing a 2 MGY flow cutoff for new indirect discharging facilities in the Oily Wastes subcategory based on the potential POTW permitting burden that would be associated with developing and then maintaining permits for new sources with low flows and the likelihood that these facilities discharge a small amount of pound-equivalents at these low flow rates. The Agency assumes that the pound-equivalents per facility for new facilities with flows below or equal to 2 MGY would be even lower than the 2 pound-equivalents per facility for similarly sized existing sources in this subcategory. The Agency concluded that a similar (or even smaller) amount of pollutant removal is not justified by the cost of the regulation for new indirect Oily Waste facilities discharging less than or equal to 2 MGY.

3. Calculation of PSNS Limitations

The Agency is proposing PSNS limitations equivalent to PSES for the same pollutants that it proposed PSES regulations. The PSNS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.67. (See Section XII.I.3. for PSES discussion and see Section XXI.C for a discussion of monitoring flexibility.)

4. PSNS Analysis

Since EPA is proposing to set PSNS equal to PSES (Option 6) and this option is determined to be economically achievable for these facilities under PSES, the Agency concluded that this would not create a barrier to entry.

M. NSPS for the Railroad Line Maintenance Subcategory

1. Need for NSPS

EPA expects that new facilities in the Railroad Line Maintenance subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for NSPS regulation is the same as the need for BPT regulation. (See Section IX.G.1.)

2. Selected NSPS Option

EPA is proposing New Source Performance Standards for this subcategory based on BAT Option 10, dissolved air flotation plus in-process flow control and pollution prevention. The Agency determined that Option 10 is the best available demonstrated technology for the removal of pollutants in this subcategory and is proposing this option for the same reasons it selected this option for BPT and BAT. (See Section IX.G.2).

3. Calculation of NSPS Limitations

The Agency is proposing NSPS limitations equivalent to those proposed for BPT for this subcategory. The NSPS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.76. (See Section XXI.C for a discussion of monitoring flexibility.)

4. NSPS Analysis

EPA notes that railroad line maintenance facilities do not have revenue reported at the facility level, and it is therefore not possible to compare costs as a percent of facility revenue for new and existing facilities in this subcategory. In addition, EPA is proposing to set NSPS equal to BAT (Option 10) and has determined this option is economically achievable for these facilities under BAT, therefore, EPA concluded that NSPS based on Option 10 would not create a barrier to entry.

N. PSNS for the Railroad Line Maintenance Subcategory

1. Rationale for Not Proposing PSNS

EPA expects that new facilities in the Railroad Line Maintenance subcategory will discharge similar quantities of the

same pollutants that existing sources discharge. Therefore, EPA is proposing to not establish PSNS for this subcategory for the same reasons that it did not propose PSES. (See Section XII.J.1).

O. NSPS for the Shipbuilding Dry Dock Subcategory

1. Need for NSPS

EPA expects that new facilities in the Shipbuilding Dry Dock subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, the need for NSPS regulation is the same as the need for BPT regulation. (See Section IX.H.1).

2. Selected NSPS Option

EPA is proposing New Source Performance Standards for this subcategory based on BAT Option 10, dissolved air flotation plus in-process flow control and pollution prevention. The Agency determined that Option 10 is the best available demonstrated technology for the removal of pollutants in this subcategory and is proposing this option for the same reasons it selected this option for BPT. (See Section IX.H.2).

3. Calculation of NSPS Limitations

The Agency is proposing NSPS limitations equivalent to those proposed for BPT for this subcategory. The NSPS limitations for this subcategory can be found in the proposed rule (which accompanies this preamble) at § 438.76. (See Section XXI.C for a discussion of monitoring flexibility.)

4. NSPS Analysis

Since EPA is proposing to set NSPS equal to BAT (Option 10) and has determined that this option is economically achievable for these facilities under BAT, EPA concluded that NSPS based on Option 10 would not create a barrier to entry.

P. PSNS for the Shipbuilding Dry Dock Subcategory

1. Rationale for Not Proposing PSNS

EPA expects that new facilities in the Shipbuilding Dry Dock subcategory will discharge similar quantities of the same pollutants that existing sources discharge. Therefore, EPA is proposing to not establish PSNS for this subcategory for the same reasons that it did not propose PSES. (See Section XII.K.1)

XIV. Issues Related to the Methodology Used to Determine POTW Performance

For today's proposal, EPA used its traditional methodology to determine POTW performance (percent removal) for toxic and non-conventional pollutants. POTW performance is a component of the pass-through methodology used to identify the pollutants to be regulated for PSES and PSNS. It is also a component of the analysis to determine net pollutant reductions (for both total pounds and toxic pound-equivalents) for various indirect discharge technology options. However, as discussed in more detail below, EPA is evaluating several issues related to its traditional methodology for determining POTW performance and solicits comments a variety of methodological changes.

A. Assessment of Acceptable POTWs

EPA developed the principal pass-through analysis for today's MP&M proposal by using data from all 50 POTWs that were part of the 50 POTW Study data base. Some of these POTWs were not operated to meet the secondary treatment requirements at 40 CFR part 133 for all portions of their wastestream. Most POTWs today have secondary treatment or better in place. EPA estimates that as of 1996, POTWs with at least secondary treatment in place service greater than 90 percent of the indirect discharging population. If the POTW removal calculations do not reflect the upgrades and system improvements that have occurred since the time of the 50 POTW Study, they would tend to under-estimate POTW removals. This would result in overestimating the pollutant reductions that are achieved through the regulation of indirect dischargers, thereby making the regulation appear more cost-effective for indirect dischargers than it is.

One partial solution to this methodological issue would be to evaluate individual treatment trains in the 50 POTW Study data base, and include only those treatment trains that achieved compliance with 40 CFR part 133 in the analysis of POTW pollutant removal rates. There were 29 treatment trains that achieved BOD_5 and TSS effluent concentrations between 15 mg/l and 45 mg/l during the sampling and could potentially be considered reflective of secondary treatment (based on 40 CFR 133.102 limitations of 30 mg/l monthly average and 45 mg/l weekly max for secondary treatment), and an additional 2 treatment trains were either trickling filters or waste stabilization ponds that achieved BOD_5 and TSS effluent concentrations between 40 mg/l and 65 mg/l and could potentially be considered equivalent to secondary treatment pursuant to 40 CFR 133.101(g) (based on 40 CFR 133.105 limitations of 45 mg/l monthly average and 65 mg/l weekly maximum). In addition, 15 treatment trains achieved BOD_5 and TSS effluent concentrations below 15 mg/l each, and could potentially be considered greater than secondary treatment.

Using data from these 46 treatment trains only would omit the worst performers in the 50 POTW Study that are probably not reflective of current performance. It might not fully correct, however, for additional upgrades and optimization that may have occurred over the past two decades.

B. Assessment of Acceptable Data

EPA developed the pass-through analysis that is the basis for today's proposal using POTW data editing criteria that are generally consistent with those used for the industry data. Specifically, EPA included only data from POTWs for which influent concentrations were 10 times the analytical minimum (quantitation) level (10xML) if available. If none of the average pollutant influent concentrations are at least 10 times the ML, then EPA retained only data from POTWs for which influent concentrations were 2 times the analytical minimum level. Because it is difficult to achieve the same pollutant reduction (in terms of percent) in a dilute wastestream as in a more concentrated wastestream, EPA believes that a 10 X ML editing criteria may overestimate the percent removals that are calculated for both industry and POTWs in the pass-through analysis.

As a general rule, more POTW data than industry data is eliminated through this editing criteria for the specific pollutants that are being examined. This is not surprising since the pass-through analysis would not even be performed on pollutants generally found at less than 10 times the method minimum level in industry since EPA would, in many cases, not require pretreatment for such low levels of a pollutant. As a result of this imbalance (pollutant influent levels at POTWs being less than pollutant influent levels to industrial pretreatment), EPA believes that it is possible that this editing criteria may bias the pass-through results by over-estimating POTW removals where influent concentrations are generally lower. This would result in underestimating the pollutant reductions that are achieved through the regulation of indirect dischargers thereby making the rule appear less cost-effective than it is. On the other hand, there may be little difference in percent removals across the range of

influent concentrations generally experienced by POTWs.

One potential solution to this methodological question would be to include data (for both indirect dischargers and POTWs) even if the influent concentration is not 10 times the analytical minimum level. This solution needs to be considered in context, however, with data handling criteria for effluent measurements of ''non-detect'' discussed below.

C. Assessment of Removals When Effluent Is Below the Analytical Method Minimum Level

EPA developed the pass-through analysis that is the basis for today's proposal using the analytical method minimum level as the effluent value when the pollutant was not detected in the effluent. This is the approach that is generally used when developing pollutant reduction estimates for the regulation, performing cost-effectiveness calculations, and developing effluent limitations. EPA believes that this methodology may underestimate the performance of the selected technology option for both directs and indirects. Once again, this would result in underestimating the removals estimated for direct dischargers, and thereby making the rule appear less cost-effective than it is. For indirect dischargers, EPA believes that the overall effect of using the minimum level for non-detect values for both industry and POTW data creates a bias for underestimating POTW removals in comparison to industry removals. This may result in an overestimation of pollutant removals by indirect dischargers, and may make the rule appear more cost-effective than it is. [Note that this problem is minimized by only using data with influent levels exceeding 10 X ML, because a non-detect assures that at least 90 percent of the pollutant has been removed. It is arguably less important that the true removal may be greater than 90 percent, rather than exactly 90 percent. Using a less stringent editing criteria of 2 X ML as discussed above would exacerbate this problem. If the influent were only 2 X ML, then removals greater than 50 percent could never be measured.]

One potential alternative would be to assume a value of one half of the minimum level for effluent values of non-detect. This approach would have to be applied uniformly for the indirect dischargers as well as the POTWs in order for the percent removal calculations to be reasonable.

For a more detailed discussion of alternative approaches to the POTW pass-through analysis, see the Appendix to Section 7 of the Technical Development Document. EPA solicits comment on the significance of each of these methodological issues and the potential alternatives.

XV. Methodology for Estimating Costs and Pollutant Reductions

EPA estimated industry-wide compliance costs and pollutant loadings using model sites based on technical questionnaire respondents and a computerized design and cost model for the MP&M technology options (see Sections 11 and 12 of the Technical Development Document for a detailed discussion of EPA's MP&M Design & Cost Model). The Agency estimated industry-wide costs and pollutant loadings for several technology options based on technologies designed for each subcategory of model sites. EPA used these model sites to estimate costs for 63,000 MP&M wastewater-discharging sites nationwide using statistically calculated industry weights (*i.e.,* survey sample weights). EPA notes that once the low flow exclusion is applied, the number of sites expected to incur costs under the MP&M regulation is 10,300.

There are 890 sites which indicated that they were water dischargers on their technical questionnaire and provided EPA with enough data to include them in the cost model. EPA assessed each of the 890 sites selected to determine the unit operations, wastewater characteristics and treatment technologies currently in place at the sites.

Based on the information provided by the sites in their questionnaire responses, follow-up letters, and phone calls, EPA classified each wastewater stream by the type of unit operation (*e.g.,* machining, electroplating, acid treatment, etc.) and base metal type (*e.g.,* steel, aluminum, zinc, etc.). The Agency used the following additional questionnaire data to characterize process wastewater streams: wastewater discharge flow rate, production rate, operating schedule, and discharge destination. Many of the sites provided these data for all wastewater streams generated on site. For sites that did not provide complete data, EPA either estimated the missing data based on technical considerations specific to the site, or statistically imputed the data. The Agency modeled the concentration of each pollutant in each wastewater stream from field sampling of wastewater discharges from the unit operations at MP&M sites. EPA used questionnaire responses to identify the following information about end-of-pipe technologies in place at MP&M sites: the types of treatment units in place; the unit operations discharging process wastewater to each treatment unit; and the operating schedule of each treatment unit.

EPA developed a computerized design and cost model to estimate compliance costs and pollutant loadings for the MP&M technology options, taking into account each site's level of treatment in place. As a conservative estimate for estimating baseline (prior to compliance with these proposed regulations) pollutant loadings, EPA assumed that all sites with treatment currently in place (including those sites not currently covered by the Metal Finishing regulations) were currently meeting the long-term average (LTA) concentrations (*i.e.,* design concentrations) for the pollutants limited under the Metal Finishing effluent guidelines (40 CFR part 433) with the exception of cyanide and were meeting the LTA concentrations achieved by EPA's sampled MP&M BAT facilities for cyanide and other pollutants of concern. For sites that did not report treatment in place, EPA based baseline pollutant loadings on EPA's unit operation-by-unit operation sampling data for raw wastewater. The Agency programmed the model with technology-specific modules which calculated the costs for various combinations of technologies included in the technology options for each subcategory. EPA based design and cost data on MP&M site data, literature data, and vendor data. The Agency developed technology-specific cost modules for the in-process pollution prevention and water use reduction technologies and end-of-pipe treatment technologies discussed in Section VII.A of this notice.

The model provided the following types of information for each technology designed for a model site: capital costs; operating and maintenance costs; electricity used and associated cost; sludge generation and associated disposal costs; waste oil generation and associated disposal costs; water use reduction and associated cost credit; chemical usage reduction and associated cost credit; effluent flow rate; and effluent pollutant concentrations. This data enabled EPA to develop site by site compliance costs and pollutant reductions for the costed sites.

If contract hauling of wastewater for off-site treatment and disposal was less costly than on-site treatment, EPA estimated costs assuming the model site would contract haul the wastewater. EPA made this assessment on a technology-specific basis. When estimating costs for sludge disposal, EPA assumed all sludge to be F006

listed (or other F-listed hazardous waste) hazardous waste under RCRA (40 CFR 261.31) and would, therefore, be disposed of off-site as hazardous waste. As a conservative estimate for the model, EPA did not allow the time for storage of the sludge prior to disposal to exceed 90 days, regardless of the facilities RCRA generator status (*i.e.,* exempt, small, large). EPA notes that on March 8, 2000 (65 FR 12377), the Agency published a final regulation in the **Federal Register** extending the accumulation time, under RCRA, for certain wastewater treatment sludges from electroplating processes to be held on-site without requiring a hazardous waste storage permit. Facilities implementing pollution prevention, recycling and metals recovery meeting certain requirements can accumulate F006 sludge for up to 180 days for large quantity generators (or 270 days for small quantity generators).

After estimation of capital and operating and maintenance costs, EPA calculated the total capital investment (TCI), and the total annualized cost (TAC). The Agency assumed that facilities meeting local limitations or national effluent limitation guidelines and pretreatment standards will already incur monitoring costs. EPA solicits comment on the whether facilities will incur additional monitoring costs to comply with today's proposal (and how much that monitoring would cost). EPA has incorporated several options for adding additional flexibility in regards to monitoring (See Section XXI.C for a discussion on monitoring flexibility). EPA expects that these proposed flexibilities will decrease the overall burden and costs of analytical wastewater monitoring for facilities within the scope of this rule.

XVI. Economic Impact and Social Cost Analysis

A. Introduction

EPA's economic analyses are presented in the report titled *''Economic, Environmental, & Benefit Analysis of the Proposed Metal Products & Machinery Rule* [EPA–821–B–00–008] (hereafter referred to as the ''EEBA''). This report presents the social costs and benefits of the proposed rule and alternatives, and estimates the expected economic impacts of compliance with the proposed rule in terms of facility closures and associated losses in employment. Other measures of economic impact include firm-level impacts, local community impacts, international trade effects, employment effects, and effects on new MP&M facilities. An analysis of impacts on small businesses supports EPA's compliance with the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA). This section of the preamble summarizes the economic impact and social cost findings from the EEBA. The reader is referred to the full report for the details of these analyses.

EPA's determination of economic achievability are based on the findings reported in the EEBA and discussed below. The options analyzed consist of combinations of comparable technology options for the different subcategories. The three options analyzed in the economic analyses are defined as follows:

TABLE XVI–1.—REGULATORY OPTIONS CONSIDERED IN THE ECONOMIC ANALYSES

Subcategory	Proposed rule	Option 2/6/10	Option 4/8
General Metals	Technology option 2; 1 mgy flow cutoff for indirect dischargers.	Technology option 2	Technology option 4.
Metal Finishing Job Shop	Technology option 2	Technology option 2	Technology option 4.
Non-Chromium Anodizing	Technology option 2; no PSES/PSNS for indirect dischargers.	Technology option 2	Technology option 4.
Printed Wiring Board	Technology option 2	Technology option 2	Technology option 4.
Steel Forming & Finishing	Technology option 2	Technology option 2	Technology option 4.
Oily Wastes	Technology option 6; 2 mgy flow cutoff for indirect dischargers.	Technology option 6	Technology option 8.
Railroad Line Maintenance	Technology option 10; no PSES/PSNS for indirect dischargers.	Technology option 10	Technology option 8.
Shipbuilding Dry Dock	Technology option 10; no PSES/PSNS for indirect dischargers.	Technology option 10	Technology option 8.

Technology options 1 through 10 are described in Section VIII.A. of the preamble.

Technology options 1, 3, 5, 7 and 9 (without pollution prevention) were not further analyzed, because they remove fewer pollutants and cost more than the comparable technology options with pollution prevention.

The economic impact analyses assess how facilities will be affected financially by the proposed rule. Key outputs of the facility impact analysis include expected facility closures in the MP&M industries, associated losses in employment, and the number of facilities experiencing financial stress short of closure (''moderate impacts''). The findings from the facility impact analysis also provide the basis for the following analyses:

- A firm-level analysis, which assesses the impact on the financial performance and condition of firms owning MP&M facilities;
- An employment effects analysis, which assesses the increase in employment associated with compliance activities, the loss of employment due to facility closures, and the net effect on overall employment;
- A community impact analysis, which assesses the job losses caused by facility closures and job gains associated with compliance;
- A foreign trade analysis, which assesses the effect of the proposed rule on the U.S. balance of trade;
- A new source impact analysis, which assesses the effect of effluent guidelines on the costs and financial viability of new facilities in the MP&M industries; and
- The Initial Regulatory Flexibility Analysis (IFRA), which assesses the economic and financial impacts of the proposed rule on small entities.

B. Facility Level Impacts

1. Facility Categories Analyzed

EPA performed economic impact analyses for three categories of facilities, using different methodologies to evaluate each of the groups. The three groups are:

- Private MP&M Facilities. This group includes privately-owned facilities that do not perform railroad line maintenance and are not owned by governments. This major category

includes private businesses in a wide range of sectors or industries, including. This segment includes facilities that manufacture and rebuild railroad equipment. Only facilities that repair railroad track and equipment along the railroad line are not included.

• Railroad line maintenance facilities maintain and repair railroad track, equipment and vehicles.

• Government-owned facilities include MP&M facilities operated by municipalities, State agencies and other public sector entities such as State universities. Many of these facilities repair, rebuild, and maintain buses, trucks, cars, utility vehicles (*e.g.,* snow plows and street cleaners), and light machinery.

The specific methodology used to assess impacts differs for each of the three types of MP&M facilities. In each case, EPA established thresholds for measures of financial performance and compared the facilities' performance before and after compliance with each regulatory option with these thresholds.

2. Data Sources for the Facility Impact Analysis

The economic analyses rely on data provided by the financial portion of the detailed questionnaire distributed to MP&M facilities by EPA under the authority of Section 308 of the Clean Water Act (''Section 308 Survey''). (See Section V.B for information on the MP&M survey questionnaires). The survey was conducted in two phases, covering different MP&M industries in each phase. The Phase I survey covered seven industry sectors and reported data for fiscal years 1987 to 1989. The Phase II survey covered an additional ten industry sectors (all remaining MP&M sectors except Steel Forming and Finishing, which was the subject of a separate survey) and reported data for fiscal years 1994 to 1996. The survey financial data were extrapolated to 1999 dollars using the Producer Price Index. The survey financial data included three years of income statements and balance sheets for the facility; the composition of revenues by customer type and MP&M business sector; estimated value of facility assets and liabilities in liquidation; borrowing costs; ownership of the facility; and total revenues and employment of the owning entity (if separate from the facility). The impacts assessed for these sample facilities were extrapolated to the national level using facility sample weights that are based on the sample design for the industrial detailed surveys.

Data for facilities in the railroad line maintenance subcategory came from a modified version of the Phase II survey administered to railroad operating companies. The questionnaire was modified because railroad operating companies generally do not monitor financial performance or collect financial data at the facility level for line maintenance facilities. The railroad operating companies reported the number of MP&M facilities in each operating unit, and provided detailed operating company financial data and technical data for each line maintenance facility.

Data for the Steel Forming and Finishing Subcategory came from a 1997 Section 308 survey of iron and steel facilities. This survey requested financial data generally similar to that collected by the MP&M surveys, including income statements and balance sheets for Fiscal Years 1995–1997 for the facility and the parent firm.

Government-owned MP&M facilities provided data in response to a Phase II Section 308 survey of municipal and other government agency facilities. This survey requested information on fiscal year 1996 sources and amounts of revenue and debt levels for both the government entity and the MP&M facilities; and demographic data for the population served by the government entity.

In addition to the survey data, a number of secondary sources provided data for the analysis. Secondary source data were used to characterize background economic and financial conditions in the industries subject to the MP&M effluent guideline. Secondary sources used in the analysis include:

• Department of Commerce economic census and survey data, including the Censuses of Manufactures, Annual Surveys of Manufactures, and international trade data;

• The Benchmark Input-Output Tables of the United States, published by the Bureau of Economic Analysis in the Department of Commerce;

• Price index series from the Bureau of Labor Statistics, Department of Labor;

• U.S. Industry and Trade Outlook, published by McGraw-Hill and the U.S. Department of Commerce;

• Industry trade publications; and

• Financial publications, including the Value Line Investment Survey and Robert Morris Associates annual data summaries.

3. Methodology and Impact Measures for the Facility Level Analysis

a. Private MP&M Facilities

EPA performed two categories of financial analysis, one to assess the potential for facility closures and the other to assess the potential for moderate financial impacts on MP&M facilities. These analyses considered facility financial condition in the absence of the rule (under baseline conditions) and changes in financial condition that would result from the proposed rule.

EPA used two financial tests to estimate closures among general MP&M facilities:

• After-Tax Cash Flow: EPA examined after-tax cash flow (ATCF) over a three year period to determine the financial condition of general MP&M facilities.

• Net Present Value: EPA also performed a net present value (NPV) test, which compared the liquidation value of each facility to the present value of expected future earnings. A business may close if the value of closing (its liquidation value) exceeds its value as an ongoing business (calculated as the present value of expected future earnings).

EPA determined that a facility is subject to severe financial stress and is a potential closure if ATCF is negative, since businesses generally cannot sustain negative cash flows for long periods of time. This test used the average of reported financial data over three fiscal years. Baseline cash flow is defined as the sum of reported net income and depreciation. The measure is widely used within industry in evaluating capital investment decisions because both net income and depreciation (which is an accounting offset against income, but not an actual cash expenditure) are potentially available to finance future investment. However, assuming that total baseline cash flow is available over an extended time horizon (for example, 15 years) to finance investments related to environmental compliance could overstate a site's ability to comply. In particular, the cost of existing capital equipment (not associated with regulatory compliance) is not netted out of cash flow, as it is of income through the subtraction of depreciation. Thus, any costs associated with either replacing existing capital equipment, or repaying money that was previously borrowed to pay for it, are omitted from the facility analysis. EPA requests comment on its use of cash flow as a measure of resources available to finance environmental compliance and suggestions for alternative methodologies. (See Section XXII of today's notice.)

Where estimates of liquidation values were available, EPA also conducted the NPV test. NPV is the present value of expected future earnings less the

liquidation value (including closure and post-closure costs) of the facility. If NPV is negative, then a business owner is financially better off closing the facility and liquidating its assets, rather than keeping the facility open. EPA estimated the present value of the facility's expected future earnings by discounting its annual after-tax cash flow over a fifteen-year period using a 7 percent discount rate. EPA presumed that a facility was a potential closure if the facility had an NPV less than zero.

Where liquidation values were available, facilities that failed *both* tests under baseline conditions are baseline closures. Facilities that pass at least one of the two tests in the baseline case but then fail both tests post-compliance were considered closures due to the rule. Where liquidation values were not provided by the survey, EPA applied only the ATCF test to identify baseline and regulatory closures.

In many past rules, EPA has used only the cash flow test to predict both baseline and regulatory closures. Using both tests presents a higher hurdle and thus makes it less likely that a facility experiencing stress will be projected to close. Due to data limitations, both tests were used for only 18,913 (approximately a third) of the 58,421 private MP&M facilities considered in the analysis. For the remaining two-thirds of the facilities, only the after-tax cash flow test was used. Table XVI–2 shows the impacts on estimated closures of using both tests, rather than the cash flow test alone, to predict closures.

TABLE XVI–2.—BASELINE CLOSURES, REGULATORY CLOSURES, AND NATIONAL ESTIMATES OF COMPLIANCE COSTS FOR PRIVATE MP&M FACILITIES BY STATUS UNDER TESTS FOR CLOSURES: 18,913 FACILITIES FOR WHICH BOTH TESTS WERE USED

Closure test	Baseline closures	Facilities remaining open in the baseline	Status under proposed option	
			Regulatory closures	Pre-tax compliance costs ($1999 million)
Fail ATCF Only	3,211	15,766	225	$1,782.6
Fail NPV Only	4,243	14,734	244	1,657.2
Double Test: Fail ATCF and NPV Text	2,711	16,266	169	1,793.4

If the cash test alone had been used, about 500 additional baseline closures and 56 additional regulatory closures would have been projected for the proposed rule. Depending on the subcategories in which these facilities were located, this could have affected EPA's achievability determinations in some cases. EPA requests comment on its methodology for estimating facility closures for this rule.

All sellers in an affected market may benefit from higher prices when prices rise in response to compliance costs, whether or not they incur compliance costs under the rule. Some facilities that have very low compliance costs may even gain more from increased prices than they lose due to increased costs associated with the rule. The analysis takes into account the effect of price increases that are attributable to the regulation. The estimated price increases were generally less than 1 percent and in no case exceeded 2 percent.

EPA also identified private MP&M facilities that are not expected to close but that might nonetheless experience moderate financial impacts as a result of the rule. The analysis of moderate financial impacts examined two financial indicators:

- Pre-Tax Return on Assets (PTRA): The ratio of cash operating income to total assets measures the facility's profitability.
- Interest Coverage Ratio (ICR): The ratio of cash operating income to interest expenses measures the facility's ability to service its debt and borrow for capital investments.

These two measures are among the criteria that creditors and equity investors use to determine whether and under what terms to provide financing to a business. The PTRA and ICR also provide insight into the ability of a business to generate funds for compliance investments internally. A business may have some trouble obtaining financing if its profitability is low and its ability to pay its continuing interest expenses is uncertain. EPA compared baseline and post-compliance PTRA to an 8 percent threshold and ICR to a threshold of 4. A facility is considered subject to incremental moderate impacts attributable to the proposed regulation if its PTRA and its ICR both pass these thresholds in the baseline but it fails one or both of the tests after compliance with the rule. Facilities failing one of the tests in the baseline and both tests post-compliance were not counted as experiencing moderate impacts, but this may in some cases be indicative of moderate rule-related impacts as well.

EPA assumed that MP&M facilities would be able to recover some of their regulatory costs by raising prices to their customers. An analysis of the potential for cost recovery considered conditions in each individual MP&M industrial sector industry (*e.g.* aircraft, aerospace, electronic equipment, etc.) Cost pass-through factors were estimated for each sector. The cost pass-through factor blends findings from two separate analyses to estimate a composite measure of pass-through potential:

- An econometric analysis of the historical relationship between output prices and changes in input costs; and
- An analysis of indicators of pass-through potential based on market structure and performance.

Market structure factors include:

- Market power based on the degree of horizontal and vertical integration;
- Extent of competition from foreign suppliers (in both domestic and export markets);
- Barriers to competition as indicated by above normal, risk-adjusted profitability; and
- Long term growth trends in the industry.

The analysis of pass-through potential indicates the percentage of compliance costs that EPA expects firms subject to regulation to recover from customers through increased prices. The estimated percentage price increases were very small for the proposed rule, ranging from 0.02 percent to less than two percent in different sectors. This analysis can be found in Appendix B of the EEBA.

Table XVI–3 summarizes the measures used to assess impacts for private MP&M facilities.

TABLE XVI–3.—SUMMARY OF FACILITY IMPACT METHODOLOGY FOR PRIVATE MP&M FACILITIES

Impact category	Description	Criteria	Significance of negative finding
Baseline Closure	Identifies facilities that are in jeopardy of financial failure independent of the proposed regulation.	1. After-tax cash flow (ATCF) negative? and 2. Liquidation value exceed going concern value (NPV test)?	Facilities failing both tests are considered baseline closures and excluded from subsequent analyses.
Post-Compliance Closure	Identifies facilities that are likely to close instead of implementing the pollution prevention and treatment systems required to comply with the rule.	1. Post-compliance after-tax cash flow (ATCF) negative? and 2. Liquidation value exceed post-compliance going concern value?	Facilities failing both tests are projected to close as the result of regulation—an incremental severe economic impact.
Moderate Financial Impacts	Identifies facilities that may have difficult financing compliance investments or on-going business investments as a result of the rule.	1. Decline in pre-tax return on assets (PTRA) to a level that jeopardizes access to financing? or 2. Decline in interest coverage ratio (ICR) to a level that jeopardizes access to financing?	Facilities passing both tests in the baseline but failing one or both tests post-compliance are considered to experience incremental moderate economic impacts attributable to the regulation.

b. Railroad Line Maintenance Facilities

Railroad operators are unlikely to evaluate the financial performance of repair and maintenance facilities as separate profit centers, and are therefore not likely to estimate revenues at the facility level. EPA conducted an analysis of impacts of these facilities at the railroad operating company level, and assessed whether the combined impact of compliance costs for the regulated facilities owned by each operating company would cause a deterioration in the company's financial performance. The analysis predicted that railroad line maintenance facilities would close only if the railroad operating company as a whole was predicted to close, based on the same closure tests described above for other private MP&M facilities. Railroad facilities other than the line maintenance facilities perform the same type of operations as other MP&M facilities and are included in the General Metals and Oily Wastes subcategories, depending on their MP&M activities.

c. Government-Owned Facilities

Governments with facilities affected by the proposed rule may take one of three actions in response to the rule:

- Replace one or more MP&M municipal facilities with a non-municipal provider for services;
- Discontinue these services altogether; or
- Pay for compliance and continue operations.

EPA assumed that all government-owned facilities would continue operating under the proposed rule. The economic impact analysis for these facilities evaluates whether a government entity would incur a major budgetary burden as a result of complying with the proposed rule. Like private firms, governments could in some cases minimize the impact of the proposed rule on their budgets by discontinuing operations at the regulated facility, rather than paying the costs of compliance. Unlike the analysis for private sector MP&M facilities, the analysis of government impacts did not consider potential closures and therefore may overstate the impacts of the rule on governments that own MP&M facilities.

EPA evaluated impacts for government-owned facilities by performing three tests.

- Impacts on site-level cost of service: This test assesses whether facility compliance costs would exceed one or more percent of the total baseline cost of service at that facility. EPA assumed that facilities can absorb compliance costs within their current budget if the costs do not exceed one percent of total costs in the baseline.
- Impacts on taxpayers: This test compared compliance costs to the income of households that are served by the relevant government, and that may support the government through taxes and fees. (If the government is a regional transit authority, for example, then the households included in this analysis are all households in the region that provides funding for the transit authority, as reported in the Phase II Section 308 survey.) A government might be expected to experience impacts if the ratio of total annualized pollution control costs per household to median household income exceeds one percent post-compliance. This comparison considered the government entity's existing pollution control costs plus the compliance costs incurred by all of its MP&M facilities under this rule. EPA uses this test in its Economic Guidance for Water Quality Standards as a screening measure to determine when communities would incur ''little economic impact'' from total pollution control costs. EPA recognizes that most local governments receive at most a few percent of the income of their tax or fee base (and some receive much less). Thus, one percent of median income for pollution control costs alone may be a very significant share of the local government's total budget.
- Impact on government debt levels: This test assessed the impact of financing the capital costs of compliance on the government's overall debt burden. The government might be expected to experience impacts if financing all of the compliance capital investments would increase its total debt service payments to more than 25 percent of baseline revenue. This criterion is used in EPA's MUNIPAY model as a level beyond which debt service costs might adversely affect a community's credit-worthiness. EPA determined that a government facility that failed all three tests is likely to suffer severe adverse impacts as a result of the rule. As shown in Table XVI–12 below, no governments fail the latter two tests. However, 215 facilities failed the site-level cost of service test. The governments operating these facilities could experience some level of impacts as a result of the rule, if these facilities represent a significant cost to their budgets. Government owned facilities perform the same type of operations as other MP&M facilities and are included in the General Metals and Oily Wastes subcategories, depending on their MP&M activities.

4. Baseline Closure Analysis

The estimated baseline closures for both indirect and direct discharge facilities are summarized in Table XVI–4. Of the estimated 62,752 discharging facilities, 6.1 percent or 3,829 facilities

were assessed as baseline closures. The 3,829 baseline closures include 3,678 indirect dischargers, or 6.3 percent of indirect dischargers, and 151 direct dischargers, or 3.1 percent of direct dischargers. The facilities estimated to close in the baseline analysis are in jeopardy of financial failure independent of the proposed rule. These facilities were excluded from the post-compliance analysis of regulatory impacts. Data on facility start-ups and closures from the Census Statistics of U.S. Businesses indicate that between 6 and 12 percent of facilities in the major metal products manufacturing industries close in any given year. EPA's estimate may therefore understate actual baseline closures somewhat.

TABLE XVI–4.—SUMMARY OF BASELINE CLOSURES

Subcategory	Total number of dischargers	Number of baseline closures	Percent of baseline closures	Operating in baseline
General Metals	29,975	3,199	10.7	*26,776
Metal Finishing Job Shop	1,530	286	18.7	1,244
Non-Chromium Anodizing	190	40	21.1	150
Printed Wiring Board	635	3	0.5	632
Steel Forming & Finishing	153	6	3.9	147
Oily Wastes	29,425	295	1.0	29,130
Railroad Line Maintenance	832	0	0.0	832
Shipbuilding Dry Dock	11	0	0.0	11
All Categories	62,752	3,829	6.1	*58,922

*Excludes 64 facilities that close under baseline conditions but that are expected to continue operating under the proposed rule.
Note: may not sum to totals due to independent rounding.

Of the facilities closing in the baseline, 64 are projected to continue operating under the proposed rule because they qualify for the low flow cutoff (and therefore incur no compliance costs) but benefit from price increases caused by the rule. These 64 facilities are not considered in the remainder of the economic impact analysis.

5. Facility Level Costs by Subcategory

The Technical Development Document presents EPA's engineering estimates of costs that will be incurred by facilities to comply with the proposed rule and other regulatory options. EPA adjusted the engineering costs from 1996 to 1999 dollars using the *Engineering News-Record* Construction Cost Index (CCI), and adjusted the costs to reflect the effect of taxes using the maximum Federal income tax rate of 34 percent. The annual equivalent of capital and other one-time costs is calculated by annualizing costs at a seven percent discount rate over an estimated 15 year equipment life.

The compliance costs of the rule are the costs paid by those facilities that continue to operate in compliance with the rule. Aggregate compliance costs presented in this section differ from the costs presented in Section IX because they exclude costs for facilities that are baseline closures or that close due to regulatory requirements. They therefore represent only the compliance outlays of facilities that continue to operate. Section H presents EPA's estimates of social costs, which include costs for regulatory closures. Table XVI–5 shows the total annualized compliance costs by subcategory for the 9,577 dischargers (direct and indirect) that are subject to requirements, make the necessary investments to meet the requirements, and continue operating under the proposed rule. The table also presents costs for Option 2/6/10 and Option 4/8, but results are discussed for only the proposed option to reduce the length of this document.

Total annualized costs are the sum of the annual operating and maintenance costs and the annualized equivalent of capital and other one-time costs. Annualized after-tax compliance costs are estimated to be $1,328.9 million ($1.33 billion) [3] per year under the proposed rule, of which 13 percent is paid by direct dischargers and 87 percent is paid by indirect dischargers. A total of 49,147 indirect dischargers are excluded from regulation by the proposed exclusions and low flow cutoffs. Total compliance costs would be 36 percent higher under Option 2/6/10 ($1,812 million per year paid by 57,641 facilities) and 120 percent higher under Option 4/8 ($2,918 million per year paid by 55,959 facilities) than under the proposed rule.

TABLE XVI–5.—TOTAL ANNUALIZED FACILITY* COMPLIANCE COSTS BY SUBCATEGORY, DISCHARGE STATUS AND REGULATORY OPTION
[After-tax, million $1999]

Subcategory	Proposed rule		Option 2/6/10		Option 4/8	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
General Metals	$132.3	$969.9	$132.3	$1,295.8	$195.1	$1,885.5
Metal Finishing Job Shop	0.8	80.1	0.8	80.1	1.5	112.1
Non-Chromium Anodizing	.....	0.0	.....	17.5	.....	26.0
Printed Wiring Board	1.7	93.4	1.7	93.4	3.0	141.2
Steel Forming & Finishing	20.9	14.0	20.9	14.0	22.7	21.8
Oily Wastes	9.3	4.3	9.3	143.8	50.0	457.4
Railroad Line Maintenance	0.8	0.0	0.8	0.2	0.9	0.4

[3] EPA notes that pre-tax annualized compliance costs are estimated to be $1.98 billion (in 1999 dollars).

TABLE XVI–5.—TOTAL ANNUALIZED FACILITY* COMPLIANCE COSTS BY SUBCATEGORY, DISCHARGE STATUS AND REGULATORY OPTION—Continued

[After-tax, million $1999]

Subcategory	Proposed rule		Option 2/6/10		Option 4/8	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Shipbuilding Dry Dock	1.4	0.0	1.4	0.1	0.4	0.1
All Categories: Annual Costs	167.2	1,161.7	167.2	1,644.9	273.6	2,644.5
All Categories: Number of Regulated Facilities Continuing to Operate Post-Regulation	4,633	4,944	4,633	53,008	4,615	51,344
Total Costs to Industry by Option, Directs + Indirects	$1,328.9		$1,812.1		$2,918.1	

*This table includes facility compliance costs only. Section XVI.H. discusses the social costs of the rule. The estimates in this table exclude baseline and regulatory closures.

Note: May not sum to totals due to independent rounding.

6. Facility Level Impacts by Subcategory

The findings from the post-compliance impact analyses are summarized below, first for the PSES requirements considered for indirect discharging facilities, and then for the BAT/BPT options considered for direct discharging facilities. A third section summarizes the findings for both discharger classes. Impacts are discussed for only the proposed option, to reduce the length of the document; however, the tables present the results for Option 2/6/10 and Option 4/8. Impacts are not presented for Options 1, 3, 5, 7, and 9 (without pollution prevention) because these options remove fewer pollutants and cost more than the comparable Options 2, 4, 6, 8, and 10.

a. Indirect Dischargers

Of the 54,270 indirect discharging facilities subject to regulation after baseline closures, EPA estimates that 179 facilities or 0.3 percent could be expected to close as the result of the proposed rule, as shown in Table XVI–6. More than 90 percent of the indirect dischargers are excluded from the regulation by the low-flow cutoffs for the General Metals and Oily Wastes subcategories, and the exclusions for Non-Chromium Anodizers, Railroad Line Maintenance and Shipbuilding Dry Docks. The employment losses associated with the facility closures are estimated at 5,738 full-time equivalent (FTE) positions. The estimated losses in employment are probably substantial overestimates because the analysis does not account for the likelihood that non-closing facilities will absorb some of the employment lost from closing facilities. The proposed rule also creates new employment demand to build, install, maintain and operate compliance equipment, which offset these job losses. These job gains are discussed in Section XVI–H.4.

Another 575 facilities, or one percent of the indirect dischargers operating in the baseline, are expected to experience moderate economic impacts under the proposed rule, as shown in Table XVI–7. Both closures and moderate impacts increase substantially for Option 2/6/10 and Option 4/8, compared to the proposed rule.

TABLE XVI–6.—INCREMENTAL SEVERE IMPACTS (FACILITY CLOSURES) ON INDIRECT DISCHARGERS

Subcategory	Total operating in baseline	Number of facility closures due to the rule		
		Proposed rule	Option 2/6/10	Option 4/8
General Metals	23,140	24	1,017	2,140
Metal Finishing Job Shops	1,231	128	128	393
Non-Chromium Anodizing	150	0	91	91
Printed Wiring Board	620	7	7	25
Steel Forming & Finishing	105	6	6	6
Oily Wastes	28,219	14	14	271
Railroad Line Maintenance	799	0	0	0
Shipbuilding Dry Dock	6	0	0	0
All Categories	54,270	179	1,262	2,925

Note: May not sum to totals due to independent rounding.

TABLE XVI–7.—INCREMENTAL MODERATE IMPACTS ON INDIRECT DISCHARGERS

Subcategory	Total operating in baseline	Number of facilities experiencing moderate impacts due to the rule		
		Proposed rule	Option 2/6/10	Option 4/8
General Metals	23,140	153	1,753	1,737
Metal Finishing Job Shops	1,231	117	117	117
Non-Chromium Anodizing	150	0	0	0
Printed Wiring Board	620	301	301	315
Steel Forming & Finishing	105	4	4	4
Oily Wastes	28,219	0	0	26
Railroad Line Maintenance	799	0	0	0
Shipbuilding Dry Dock	6	0	0	0

TABLE XVI–7.—INCREMENTAL MODERATE IMPACTS ON INDIRECT DISCHARGERS—Continued

Subcategory	Total operating in baseline	Number of facilities experiencing moderate impacts due to the rule		
		Proposed rule	Option 2/6/10	Option 4/8
All Categories	54,270	575	2,175	2,199

Note: May not sum to totals due to independent rounding.

Another 575 facilities, or one percent of the indirect dischargers operating in the baseline, are expected to experience moderate economic impacts under the proposed rule, as shown in Table XVI–7. Both closures and moderate impacts increase substantially for Option 2/6/10 and Option 4/8, compared to the proposed rule.

b. Direct Dischargers

Of the 4,653 direct discharging facilities subject to regulation after baseline closures, EPA estimates that 20 facilities or 0.4 percent could be expected to close as the result of the proposed rule. These 20 are all General Metals facilities, and represent 0.6 percent of the 3,636 General Metals Direct Dischargers operating in the baseline. The employment losses associated with these facility closures are estimated at 178 FTEs. Again, estimated losses in employment associated with closures are likely to be overstated, because the analysis does not account for the likelihood that non-closing facilities will absorb some of the employment from closing facilities. In addition, compliance requirements at facilities that continue to operate will lead to off-setting increases in employment.

Another 41 facilities, or 0.9 percent of the 4,653 direct dischargers operating in the baseline, would be expected to experience moderate financial impacts due to the rule, as shown in Table XVI–9.

TABLE XVI–8.—INCREMENTAL SEVERE IMPACTS (FACILITY CLOSURES) ON DIRECT DISCHARGERS

Subcategory	Total in baseline operating	Number of facility closures due to the rule		
		Proposed rule	Option 2/6/10	Option 4/8
General Metals	3,636	20	20	35
Metal Finishing Job Shops	12	0	0	0
Non-Chromium Anodizing*	.....	.....	.....	.....
Printed Wiring Board	11	0	0	0
Steel Forming & Finishing	43	0	0	2
Oily Wastes	911	0	0	0
Railroad Line Maintenance	34	0	0	0
Shipbuilding Dry Dock	6	0	0	0
All Categories	4,653	20	20	37

*EPA estimates that there are no facilities in the Non-Chromium Anodizing subcategory that discharge directly to surface waters.
Note: May not sum to totals due to independent rounding.

TABLE XVI–9.—INCREMENTAL MODERATE IMPACTS ON DIRECT DISCHARGERS

Subcategory	Total operating in the baseline	Number of facilities experiencing moderate impacts due to the rule		
		Proposed rule	Option 2/6/10	Option 4/8
General Metals	3,636	34	34	103
Metal Finishing Job Shops	12	0	0	0
Non-Chromium Anodizing*	.....	.....	.....	.....
Printed Wiring Board	11	0	0	0
Steel Forming & Finishing	43	7	7	7
Oily Wastes	911	0	0	0
Railroad Line Maintenance	34	0	0	0
Shipbuilding Dry Dock	6	0	0	0
All Categories	4,653	41	41	110

*EPA estimates that there are no facilities in the Non-Chromium Anodizing subcategory that discharge directly to surface waters.
Note: May not sum to totals due to independent rounding.

c. Summary of Facility Impacts

Table XVI–10 summarizes the results of the economic impact analysis for all facilities and for all regulatory options analyzed. Closures and moderate impacts under the proposed option are substantially lower than in Option 2/6/10 and Option 4/8. Of the 616 facilities experiencing moderate impacts due to the proposed rule, 137 facilities fell below the threshold for pre-tax return on assets only, 38 fell below the interest coverage ratio threshold only, and 441 fell below both thresholds due to the rule. Job losses due to closures are more than off-set by job gains associated with compliance requirements under the proposed option. (See Section XVI–H.4 for a discussion of employment impacts.)

TABLE XVI–10.—SUMMARY OF INCREMENTAL FACILITY IMPACTS FOR ALL FACILITIES

Subcategory	Regulatory option		
	Proposed rule	Option 2/6/10	Option 4/8
Number of Facilities Operating in Baseline	58,922	58,922	58,922.
Number of Closures (severe impacts)	199	1,282	2,963.
Percent Closing	0.3	2.2	5.0.
Job losses due to closures (FTE-years)	5,916 (over 3 years)	16,834 (over 3 years)	48,070 (over 3 years).
Job gains due to compliance requirements (FTE-years).	8,487 (over 15 years)	12,023 (over 15 years)	27,535 (over 15 years).
Number of Additional Facilities with Moderate Impacts.	616	2,216	2,309.
Percent with Moderate Impacts	1.0	3.8	3.9.
Annualized Compliance Costs (pre-tax, billion $1999).	$1.98	$2.67	$4.18.
Annualized Compliance Costs (after-tax, billion $1999).	$1.33	$1.81	$2.92.

C. Firm Level Impacts

EPA examined the impacts of the proposed rule on firms that own MP&M facilities, as well as on the financial condition of the facilities themselves. A firm that owns multiple MP&M facilities could experience adverse financial impacts at the firm level if its facilities are among those that incur significant impacts at the facility level. The firm-level analysis is also used to compare impacts on small versus large firms, as required by the Regulatory Flexibility Act and the Small Business Regulatory Enforcement Fairness Act. (RFA/SBREFA issues are discussed in Section XX.C of this preamble.)

EPA compared compliance costs with revenue at the firm level as a measure of the relative burden of compliance costs. EPA applied this analysis only to MP&M facilities owned by private entities. (Section XVI.D discusses impacts on governments that own MP&M facilities). The Phase I, Phase II industrial detailed, and Iron & Steel surveys identified the parent firm that owns each facility that responded to the survey. In addition, the Phase II industrial detailed survey requested that respondents provide information on other MP&M facilities owned by the same firm, on a voluntary basis. EPA estimated firm-level compliance costs by summing costs for all facilities owned by the same firm that responded to the survey plus estimated compliance costs for additional facilities for which respondents submitted information.

The Agency was not able to estimate the national numbers of firms that own MP&M facilities precisely, because the sample weights based on the survey design represent numbers of facilities rather than firms. Most MP&M facilities (43,118 of 54,590, or 80 percent) are single-facility firms, however. These firms can be analyzed using the survey weights. In addition, there are 289 firms that own more than one sample facility. These firms are included in the analysis with a sample weight of one, since it is not known how many firms these 289 sample firms represent. EPA's analysis of firm-level impacts is presented in Chapter 9 of the EEBA.

Table XVI–11 shows the results of the firm-level analysis. The results represent a total of 43,407 MP&M firms (43,118 + 289), owning 54,590 facilities (43,118 owned by single-facility firms + 11,473 owned by multi-facility firms).

TABLE XVI–11.—FIRM LEVEL BEFORE-TAX ANNUAL COMPLIANCE COSTS AS A PERCENT OF ANNUAL REVENUES FOR PRIVATE SMALL BUSINESSES: PROPOSED RULE

Number of firms in the analysis*	Number and percent with before-tax annual compliance costs/annual revenues equal to:					
	Less than 1%		1–3%		Over 3%	
	Number	Percent	Number	Percent	Number	Percent
43,407	41,236	95	1,070	2.5	1,101	2.5

*Firms whose only MP&M facilities close in the baseline are excluded.

A small percentage (2.5 percent) of the firms in the analysis incur before-tax compliance costs equal to 3 percent or more of annual revenues. Ninety-five percent incur compliance costs less than 1 percent of annual revenues, and the remaining 2.5 percent incur costs between 1 and 3 percent of revenues. Of 2,171 firms in the analysis that incur costs greater than 1 percent of revenues, 636 are single-facility small firms that were reported in the facility impact analysis to close (161 firms) or experience moderate impacts (475 firms) due to the rule.

This analysis is likely to overstate costs at the firm level for two reasons. First, it includes compliance costs for facilities that are projected to close due to the rule. The estimated compliance costs for these facilities are higher than the true cost to the firm of shutting down the facility, as illustrated by the detailed facility impact analysis that projects closures. Second, the analysis does not take account of actions a multi-facility firm might take to reduce its compliance costs under the proposed rule. These include transferring functions among facilities to consolidate wet processes and take advantage of scale economies in wastewater treatment.

D. Impacts on Governments

The proposed MP&M rule will affect governments in two ways:

- Government-owned MP&M facilities may be directly affected by the MP&M regulation and therefore incur compliance costs; and

• Municipalities that own Publically Owned Treatment Works (POTWs) that receive influent from MP&M facilities subject to the regulation may incur additional costs to implement the proposed rule. These include costs associated with permitting MP&M facilities that have not been previously permitted, and with repermitting some MP&M facilities with existing control mechanisms (*e.g.,* permits) earlier than would otherwise be required. In addition, POTWs may elect to issue mass-based control mechanisms to some MP&M facilities that currently have concentration-based control mechanisms, at an additional cost.

1. Impacts on Government-Owned Facilities

EPA administered a survey (the ''Municipal Survey'') to government-owned facilities to assess the cost of the regulation on these facilities and the government entities that own them. (See Section V.B for a discussion of EPA's data collection efforts.) The survey requested information that provides the basis for EPA's analysis of the budgetary impacts of the proposed regulation, including the size and income of the populations served by the affected government entities; the government's current revenues by source, taxable property, debt, pollution control spending and bond rating; and the costs, funding sources and other characteristics of the MP&M facilities owned by each government entity.

EPA discusses the methodology for assessing impacts on government-owned facilities in more detail in Section XVI.B.3.c. In summary, EPA used three tests to assess whether MP&M facility compliance costs would impose major budgetary impacts on the governments that own the facilities: impacts on site-level cost of service, impacts on taxpayers, and impacts on government debt. The first test assesses impacts at the facility level and the second two tests assess impacts at the government level. The Agency judged that a government would incur major budgetary impacts due to the rule if it failed all three tests.

The two government-level tests are applied incrementally. Governments that fail the test in the baseline are not considered to experience budgetary impacts attributable to the rule.

Table XVI–12 provides national estimates of the number of MP&M facilities operated by governments that are potentially subject to the proposed rule, by type and size of government.

TABLE XVI–12.—NUMBER OF GOVERNMENT-OWNED FACILITIES BY TYPE AND SIZE OF GOVERNMENT ENTITY

Size of government and status under proposed option	Municipal government	State government	County government	Regional governmental authority	Total
Large Governments (population> 50,000)	572	366	686	36	1,660
Small Governments (population <=50,000)	2,191	.....	481	.....	2,672
All Governments	2,763	366	1,167	36	4,332

Table XVI–13 summarizes the status of government-owned facilities under the various regulatory options, their compliance costs and measures of impacts on government that own MP&M facilities.

TABLE XVI–13.—NUMBER OF REGULATED GOVERNMENT-OWNED FACILITIES, COMPLIANCE COSTS AND BUDGETARY IMPACTS BY REGULATORY OPTION

	Proposed option	Option 2/6/10	Option 4/8
Total Number of Government-Owned Facilities	4,332	4,332	4,332
Number of facilities exempted by low-flow cutoff	3,603	.....	.....
Number of facilities subject to regulation	729	4,332	4,332
Compliance costs ($1999 million)	$14.1	$64.8	$224.7
Number of facilities with compliance costs > one percent of baseline cost of service*	215		
Number of governments failing the ''impact on taxpayers'' criterion**	0		
Number of governments failing the ''impacts on government debt'' criterion***	0		
Number of governments failing all three impacts criteria +	0		

* Annualized compliance costs as a percent of total facility costs and expenditures, including operating, overhead and debt service costs and expenses.

** Based on comparison of compliance costs for all facilities owned by the government to the income of households that are served by the relevant government. A government is judged to experience impacts if the proposed rule results in a ratio of total annualized pollution control costs per household to median household income that exceeds one percent post-compliance. Includes existing pollution control costs plus the compliance costs due to the MP&M rule.

*** Based on comparison of total debt service costs (including costs to finance MP&M capital costs entirely with debt) with baseline government revenue. A government is judged to experience impacts if the rule causes its total debt service payments to exceed 25% of baseline revenue.

+ A government is judged to experience major budgetary impacts if it has one or more facilities with costs of compliance above 1% of baseline cost of service and fails both the taxpayers impact and government debt impact tests.

Table XVI–13 shows that the proposed rule substantially reduces costs and impacts relative to the other options considered for government-owned facilities, because 3,603 (83 percent) of the facilities are exempted under the low flow cutoffs (110 General Metals facilities and 3,492 Oily Wastes facilities.) Compliance costs would be more than 4½ times higher under Option 2/6/10 and 16 times higher under Option 4.

An estimated 215 government-owned facilities (5 percent of the total) would incur costs under the proposed rule exceeding one percent of their baseline cost of service. Therefore, 95 percent of the government-owned facilities either incur no costs or are likely to be able to absorb the added costs within their existing budgets. None of the

governments incur costs that cause them to exceed the thresholds for impacts on taxpayers or for government debt burden. EPA therefore concludes that the proposed rule will not impose major budgetary burdens on any of the governments that own MP&M facilities.

2. POTW Administrative Costs

EPA also evaluated the costs incurred by governments to administer the rule. The rule is not expected to impose any new administrative costs associated with direct dischargers, which are already permitted by States. However, control authorities will have to issue control mechanisms (*e.g.,* permits) for the first time to some indirect discharging facilities and will have to accelerate repermitting for some indirect dischargers that currently hold control mechanisms.

The costs of issuing and enforcing permits and control mechanisms associated with the proposed rule are discussed in Section XVI.H.3 of this preamble. EPA is able to estimate total costs to POTWs, but is not able to estimate the costs to any one POTW, since it is not possible to determine what POTWs receive discharges from MP&M facilities except for those that responded to the surveys.

EPA estimates that POTWs as a whole will incur incremental average annualized costs over 15 years of between $115,000 and $912,000 under the proposed rule. The maximum expenditures by all affected POTWs in any one year will be between $186,000 and $1,607,000. These costs include issuing new control mechanisms (*e.g.,* permits) to facilities that do not currently have permits, issuing mass-based permits to some facilities that currently have concentration-based permits, and repermitting some facilities sooner than would otherwise be required to meet the three-year compliance schedule. On average, a POTW's costs for the incremental permitting are only $23 to $184 per permitted MP&M indirect discharger under the proposed rule.

EPA is requiring mass-based permits/control mechanisms only for the Steel Forming & Finishing subcategory; permits/control mechanisms for other subcategories may be concentration-based. EPA is encouraging permit writers and control authorities to issue mass-based permits and control mechanisms, however, where appropriate and feasible. The analysis of permitting costs assumes for costing purposes that one-third of the new or reissued permits/control mechanisms in subcategories other than Steel Forming & Finishing will be mass-based.

EPA expects that these increases in costs will be partially offset by reductions in government administrative costs for facilities that are already permitted under local limits and that will be repermitted under this rule. The proposed technical guidance provided by EPA as a part of this rulemaking may reduce the research required by permit writers/control authorities in developing permits and control mechanisms based on Best Professional Judgement (BPJ) for industrial dischargers not previously covered by a categorical standard or a water quality standard. Further, the establishment of discharge standards may reduce the frequency of evidentiary hearings. The promulgation of limitations may also enable EPA and the authorized States to cover more facilities under general permits. EPA did not estimate these cost savings to permitting authorities that may result from the rule.

E. Community Level Impacts

EPA considered the potential impacts of changes in employment due to the proposed rule on the communities where MP&M facilities are located. Changes in employment due to the rule include both job losses that occur when facilities close and job gains associated with facilities' compliance activities. EPA estimated that a total of 5,916 jobs would be lost at the 199 facilities projected to close under the proposed rule. At the same time, EPA estimated that manufacturing and installing compliance equipment would lead to 4,488 full-time equivalent (FTE) positions, and that operating and maintaining compliance systems would result in another 286 FTEs per year. Over a 15 year analysis period, the net effect of job gains and losses caused by the rule is an increase of 2,575 FTE-years or an average of 172 FTEs per year. This estimate assumes that workers that lose their job are unemployed for an average of one year, and that compliance investments and closures occur evenly over the first three years after promulgation. This estimate of employment impacts is likely to understate the net increase, because it ignores the fact that some production and employment lost at closing plants is likely to result in increased production and employment at other MP&M facilities. (EPA's analysis of employment impacts is discussed in more detail in Section XVI–H.4 below and in Chapter 6 of the EEBA.)

Given the projected overall increase in employment due to the proposed rule, EPA does not expect the rule to have significant impacts at the community level. It is not possible to predict precisely where the job gains and losses will occur. However, facilities that are projected to close due to the rule have employment ranging from 2 to 205 FTEs. MP&M facilities tend to be located in industrialized urban areas, and closures of this size are not likely to have a major impact on a local economy.

F. Foreign Trade Impacts

U.S. MP&M producers as a group exported products with a value of $380.3 billion in 1999. Imports to the U.S. of the same products in 1999 totaled $539.1 billion, resulting in an overall net MP&M commodity trade deficit of $153.8 billion. Some MP&M sectors contribute to a positive commodity trade balance (*e.g.* aircraft, with a $37.0 billion positive balance in 1999). In other sectors, substantially more products are imported than exported (*e.g.* motor vehicles, with a net negative balance of $96.8 billion.) Exports and imports by MP&M sector are discussed in Chapter 3 of the EEBA.

The proposed rule will have an impact on the balance of trade in MP&M products to the extent that prices for MP&M products increase and MP&M facilities reduce production. Imports may increase if domestic customers switch from domestic suppliers to foreign suppliers of MP&M products, and exports may decrease if foreign customers switch from purchasing U.S. exports to other suppliers. On the other hand, business lost by the regulated MP&M facilities due to their increased costs may be captured by other domestic producers.

Section XVI.B of this preamble and Chapter 5 of the EEBA describe EPA's analysis of changes in output that are expected to result from the proposed rule. EPA assessed the impact of these market-level changes on the U.S. balance of trade using information provided by the industrial general surveys on the source of competition in domestic and foreign markets. This analysis allocates the value of changes in output for each facility that is projected to close due to the rule to exports, imports or domestic sales, based on the predominant source of competition in each market reported in the surveys.

Table XVI–14 shows the results of this analysis. The table compares the projected changes in exports, imports and balance of trade (expressed in $1999) to baseline 1999 values for both the MP&M industries and for the U.S. balance of trade in commodities as a whole. The projected changes in trade under the proposed rule have a very

small impact on the balance of trade. The total U.S. balance of trade in commodities would decline by less than 0.01 percent and the balance of trade in the MP&M industries would decline by 0.01 percent.

TABLE XVI–14.—PROPOSED RULE IMPACTS ON FOREIGN TRADE

[Million $1999]

	1999 value of exports	1999 value of imports	Balance of Trade
Baseline			
U.S. Commodity Trade	695,797	1,024,618	(328,821)
MP&M Industries	380,305	534,141	(153,836)
Post-Compliance			
Change Due to the Proposed Rule	0	21.1	(21.1)
Percent Change In U.S. Commodity Trade Balance	0%	<0.01%	<0.01%
Percent Change in MP&M Industries Trade Balance	0%	<0.01%	0.01%

Source: U.S. Census and U.S. Environmental Protection Agency.

G. Impacts on New Facilities

EPA assessed the impacts of the proposed rule on new facilities based on the characteristics of a model facility in each subcategory and (in some cases) discharge category (direct and indirect). Engineering estimates of compliance costs for Option 2/6/10 and Option 4/8 for a representative facility reflect the typical flow size and other technical characteristics of facilities in each category. (See the Technical Development Document.) Table XVI–15 lists the compliance costs and flow size for a representative model facility in each category, along with the regulatory option considered for each subcategory.

In absence of the MP&M rule, new sources in the Metal Finishing Job Shop and Printed Wiring Board subcategories would comply with 40 CFR part 433 new source requirements, and Steel Forming & Finishing new sources would comply with 40 CFR part 420 new source requirements. Therefore, the analysis considers only the incremental costs of proposed MP&M new source requirements beyond those baseline requirements.

EPA estimated facility revenues for the model facilities based on the revenues reported for existing facilities in the Section 308 surveys. The analysis excludes facilities that are projected to close or to experience moderate economic impacts in the baseline, since the economic characteristics of these financially-weak facilities are unlikely to be representative of new facilities. EPA sorted the existing financially-sound facilities in each subcategory/discharge status by flow size, and identified facilities in each quartile based on flow size. The Agency then identified the flow size quartile that the hypothetical facility would fall into. Finally, EPA calculated the average revenue for the existing facilities in that same flow size quartile, and assumed that the hypothetical new facility would have revenues equal to that average. Table XVI–15 shows the facility revenue estimated for each model facility.

EPA calculated compliance costs as a percentage of post-compliance revenues as a measure of impacts. The projected revenues include estimated prices increases due to the rule. The analysis assumes that new sources would benefit from the small price increases resulting from the proposed rule for existing sources, and applies the same percentage price increase to calculate post-regulation revenues for the new sources. Table XVI–15 shows before-tax annual compliance costs as a percent of facility post-regulation revenues.

Finally, Table XVI–15 presents the cost-to-revenue percentage estimated for new facilities in each subcategory.

TABLE XVI–15.—NEW SOURCE IMPACTS

Subcategory	Discharge status	Existing source options proposed	New source options considered [a]	Annualized compliance costs [b] ($1999)	Facility Revenue [c] ($1999)	New Source ACC as % of Revenue
General Metals	I	2	4	$393,220	$417,071,318	0.09
General Metals	D	2	4	167,342	398,818,659	0.04
Metal Finishing Job Shops	I	2	4	65,369	1,428,443	4.64
Metal Finishing Job Shops	D	2	4	70,735	5,089,823	1.41
Non-Chromium Anodizing	I	2	4	97,108	24,201,166	0.40
Oily Wastes	I	6	8	355,874	474,228,616	0.08
Oily Wastes	D	6	8	37,815	116,772,943	0.03
Printed Wiring Board	I	2	4	70,563	35,930,097	0.20
Printed Wiring Board	D	2	4	160,184	1,029,783,596	0.02
Railroad Line Maintenance	I&D	10	8	184,261	n.a.	n.a.
Shipbuilding Dry Dock	I&D	10	8	220,492	192,018,827	0.11
Steel Forming & Finishing	I	2	4	114,851	69,640,244	0.17
Steel Forming & Finishing	D	2	4	46,945	32,759,295	0.14

Note: Technology Options 1 through 10 are described in Section VIII.A of the preamble.

[a] EPA is not proposing the new source option considered in this analysis for the Non-Chromium Anodizing, Oily Wastes, Railroad Line Maintenance, and Shipbuilding Dry Dock subcategories. See Section XIII for a discussion on new source options selection.

[b] Incremental to baseline new source requirements (found in 40 CFR 433 and 420, as applicable) for Metal Finishing Job Shop, Printed Wiring Board and Steel Forming & Finishing new sources.

[c] Equal to the average revenues of existing facilities in the same quartile based on flow size of the new source model facility, excluding existing facilities that close or experience moderate impacts in the baseline. Assumes the same percentage price increases for new as for existing sources under the proposed option.

[d] Includes existing facilities in all flow categories that continue operating post-compliance.

New sources in all but the Metal Finishing Job Shop direct discharger subcategory incur costs that are below one percent of post-regulation revenues. Cost increases of this magnitude are unlikely to place new facilities at a competitive disadvantage relative to existing sources. Moreover, costs as a percentage of revenues are generally comparable for new sources and existing sources with which they will compete.

Railroad line maintenance facilities do not have revenue reported at the facility level, and it is therefore not possible to compare costs as a percent of facility revenue for new and existing facilities in this subcategory. The representative new source railroad line maintenance facility would incur annualized costs ($184,261) that are somewhat higher than those incurred by existing facilities in this subcategory (which range from zero to $122,042.)

See Section XIII for a discussion of new source options selection. EPA notes that it did not select the ''New Source Option Considered'' in Table XVI–15, above, for the Non-Chromium Anodizing, Oily Wastes, Railroad Line Maintenance, and Shipbuilding Dry Dock subcategories, but rather selected a lower cost option for new sources.

H. Social Costs

1. Components of Social Costs

The social costs of regulatory actions are the opportunity costs to society of employing scarce resources in pollution control activity. The largest component of economic costs to society is the cost incurred by MP&M facilities for the labor, equipment, material, and other economic resources needed to comply with the proposed rule.

The social costs associated with the proposed MP&M regulation differ from the compliance costs estimated to assess impacts on the regulated facilities and firms, because of different treatment of taxes. Social costs include compliance costs that are considered on a before-tax basis. Privately-owned facilities are able to deduct the costs of compliance as business expenses, reduce their tax liability for a given level of revenue, and thereby share the burden of the costs with other taxpayers. The burden is shared with other taxpayers because the Federal government loses the money saved by industry through tax shields. The cost to society includes the costs borne by industry, as well as the cost borne by the Federal government through lost tax revenues. The cost to society, therefore, is higher than the cost to industry. The annualized lost Federal tax revenues can be calculated as the difference between the annualized cost before and after tax shields.

Social costs also include lost producers' and consumers' surplus that result when the quantity of goods and services produced decreases as a result of the rule. Lost producers' surplus is measured as the difference between revenues earned and the cost of production for the lost production. Lost consumers' surplus is the difference between the price paid by consumers for the lost production and the maximum amount they would have been willing to pay for those goods and services. Calculating lost producers' and consumers' surplus accurately requires knowledge of the characteristics of market supply and demand for each affected industry. EPA instead calculated an upper-bound estimate of social compliance costs using the simplifying assumption that all facilities continue operating in compliance with the rule, and pay the associated compliance costs (*i.e.,* assuming that there are no regulation-related closures.) This provides an upper-bound estimate of social costs because, for facilities predicted to close, continuing to operate and incurring compliance costs is more costly than closing the facility with the lost producers' and consumers' surplus associated with the closure.

In addition to the resource costs to society associated with compliance, the estimated social cost includes two other cost elements: the cost to local governments of implementing the rule and the costs associated with unemployment that may result from the proposed regulation. The government administration costs include the costs to POTWs of permitting and compliance monitoring and enforcement activities. The unemployment-related costs include the cost of administering unemployment programs for workers who would lose employment, and an estimate of the amount that workers would be willing to pay to avoid involuntary unemployment.

2. Resource Cost of Compliance

The resource costs of compliance are the value of society's productive resources—including labor, equipment, and materials—expended to achieve the reductions in effluent discharges required by the proposed rule. The social costs of these resources are higher than the costs incurred by facilities because facilities are able to deduct the costs from their taxable income. The costs to society, however, are the full value of the resources used, whether they are paid for by the regulated facilities or by all taxpayers in the form of lost tax revenues. EPA calculated costs at a 7 percent rate. EPA included facilities predicted to close due to the rule when calculating social costs.

The estimated after-tax private compliance costs incurred by facilities, excluding costs for facilities that close, are $1.3 billion. The estimated social value of these compliance costs, calculated before-tax assuming no regulatory closures, is $2.0 billion. This represents the value to society of the resources that would be used to comply with the proposed rule if all facilities continued to operate rather than some closing due to the rule. This estimate represents an upper-bound social value of the compliance resources associated with the proposed rule.

3. Cost of Administering the Proposed Regulation

EPA estimated the cost to governments of administering the proposed regulation, including the use of labor and material resources to write permits/control mechanisms under the regulation and to conduct compliance monitoring and enforcement activities.

EPA does not expect increases in administrative costs for facilities that discharge their wastewater directly to surface water, because the National Pollution Discharge Elimination System (NPDES) permit program requires that these facilities hold permits. POTWs will incur additional permitting costs for indirect dischargers that do not already have a control mechanism (*e.g.,* permit) prior to implementation of the proposed rule.

Information on the baseline number of indirect dischargers with control mechanisms comes from the industrial detailed facility surveys, which reported the baseline permit status of each MP&M facility. (*See* Section V.B for a description of EPA's survey questionnaires.) EPA estimated costs and impacts for these facilities. Results of the impact analysis indicate that of the 58,922 MP&M facilities continuing to operate in the baseline (including 64 avoided baseline closures), 199 facilities are expected to close rather than comply with the regulation. Another 49,147 are excluded or fall below the proposed low flow cut-offs. Of the 9,577 facilities that are expected to continue operating and comply with the regulation, 4,633 facilities are direct dischargers and 4,944 are indirect dischargers. EPA estimates that 4,296 of the indirect dischargers already have permits or other control mechanisms (629 with concentration-based permits and 3,667 with mass-based permits) and that 648 indirect discharging facilities will be required to get a permit/control mechanism for the first time.

EPA conducted the POTW survey of 150 POTWs to support analysis of the administrative burdens imposed by the proposed rule on POTWs that receive discharges from MP&M facilities. The questionnaire requested detailed information on the costs of various activities per facility permitted, including estimated hours required to develop and issue permits/control mechanisms, provide technical guidance, inspect facilities, conduct sampling, review compliance reports, take enforcement actions, and repermit facilities. The survey requested this information for facilities of different sizes (based on flow). In addition, the survey requested information on the frequency with which specific administrative activities are required for activities that are not required for every permitted facility (such as conducting a public hearing). EPA used the POTW survey responses to estimate a range of permitting labor hour burdens and costs per MP&M facility permitted, with separate estimates for concentration- and mass-based permits/control mechanisms. This analysis is presented in Appendix C of the EEBA.

Estimated annualized POTW administrative costs for each facility issued a new concentration-based control mechanism range from $236 to $1,890, and from $240 to $1,924 for each facility issued a new mass-based control mechanism, with the range depending on the complexity of the facility being permitted. EPA applied these costs per facility to the estimated number of facilities requiring new control mechanisms or conversion of a concentration-based to a mass-based control mechanism each year, to estimate the total administrative cost to permitting authorities. (*See* Section XXI.B for a discussion on implementation of the MP&M limitations and standards.)

EPA is requiring mass-based permits/control mechanisms only for the Steel Forming and Finishing subcategory. For other subcategories, permit writers and control authorities can determine what type of permit/control mechanism to issue. EPA is encouraging POTWs to institute mass-based limits where possible, however. (*See* Section XXII.B.) For purposes of estimating costs, EPA assumed that all Steel Forming and Finishing and one-third of the permits/control mechanisms issued in other subcategories will be mass-based.

Table XVI–16 summarizes the estimated range of administrative costs that will be incurred by POTWs under the proposed rule. The estimates reflect the low and high estimates of permitting cost per facility, and take account of the need to repermit indirect dischargers with existing control mechanisms (*e.g.,* permits) within the three year compliance period rather than on the normal five-year permitting schedule. These estimates are described in detail in Chapter 7 of the EEBA.

TABLE XVI–16.—POTW ADMINISTRATIVE COSTS: PROPOSED RULE

Number of facilities permitted:	
Converted from existing concentration-based to mass-based	*223
Issued new concentration-based permit	*432
Issued new mass-based permit	*216
Repermitted 1–2 years earlier	4,073
Number of closing facilities with existing permits not requiring repermitting under the proposed rule	143
Total POTW Administrative Costs (net present value of incremental costs over 15 years) (million $1999)	$1.407–$8.311
Total POTW Administrative Costs (annualized over 15 years @ 7% (million $1999)	$0.115–$0.912

*Assumes that permitting authorities will chose to issue mass-based control mechanisms (*e.g.,* permits) to ⅓ of the facilities requiring new permits, and ⅓ of the facilities with existing concentration-based permits, other than Steel Forming & Finishing. Mass-based permits are assumed for all 20 Steel Forming & Finishing facilities that currently have a concentration-based permit.

Total estimated government administration costs therefore range from $0.1 to $0.9 million ($1999) annually. EPA expects that this increase in costs will be partially offset by reductions in government administrative costs for facilities that are already permitted under local limits and that will be repermitted under this rule. The technical guidance provided by EPA as a part of this rulemaking may reduce the research required by permit writers and control authorities in developing Best Professional Judgement (BPJ) permits/control mechanisms for industrial dischargers not previously covered by a categorical standard or a water quality standard. Further, the establishment of discharge standards may reduce the frequency of evidentiary hearings. The promulgation of limitations may also enable EPA and the authorized States to cover more facilities under general permits. EPA did not estimate these cost savings to permitting authorities that may result from the rule.

4. Social Cost of Unemployment

The loss of jobs associated with facility closures represent a social cost of the proposed rule. The social cost of unemployment includes two components: the losses suffered by the workers that experience involuntary loss of employment, and the cost to the government of administering the unemployment compensation program for these workers.

EPA calculated the first cost of worker dislocation based on an estimate of the value that workers would pay to avoid an involuntary job loss. The estimate of the amount that workers would pay to avoid job losses was derived from hedonic studies of the compensation premium required by workers to accept jobs with a higher probability of unemployment. This framework has been used in the past to impute a trade-off between wages and job security (Topel, 1984; Adams, 1985). This estimate approximates a one-time willingness-to-pay to avoid an involuntary episode of unemployment and reflects all monetary and non-monetary impacts of involuntary unemployment incurred by the worker. It does not include any offsets to the cost of unemployment such as unemployment compensation or the value of increased leisure time. EPA estimates that workers would be willing to pay between $90,840 and $119,900 ($1999) to avoid a case of involuntary employment. Annualized over 15 years at a discount rate of 7 percent, this willingness to pay is between $9,974 and $13,164 per lost job. The cost associated with a projected loss of 5,916 jobs due to facility closures under the proposed rule therefore has an estimated annual social cost of $59.0 million and $77.9 million.

Unemployment as the result of regulation also imposes costs on society through the additional administrative burdens placed on the unemployment system. The cost of unemployment benefits themselves is not a social cost but instead a transfer payment within society from taxpayers to unemployed

workers. Administrative costs include the cost of processing unemployment claims, retraining workers, and placing workers in new jobs. Data obtained from the Interstate Conference of Employment Security Agencies indicated that the cost of administering an initial unemployment claim over the period averaged $119 ($1999). This cost includes total Federal and State funding for administering unemployment benefit programs but excludes the value of benefits. Based on these data, EPA assumed that the cost of administering unemployment programs for job losses caused by the MP&M regulation would amount to approximately $120 per job loss. Multiplying this figure by estimated loss of 5,916 jobs due to facility closures under the proposed regulation yields an additional $709,920 in social costs. EPA annualized this value over the 15-year analysis period at the 3 percent social discount rate to yield an annual cost of $77,945 ($1999).

This estimate of social costs does not take into account the increased production and employment at MP&M facilities that continue to operate under the proposed rule. These facilities are likely to gain business when some facilities close due to the rule. In addition, the analysis does not reflect the jobs created by facilities' actions to comply with the rule. The net effect of job losses due to facility closures and job gains associated with compliance activities is an increase of 2,575 FTE-years over 15 years. This estimate assumes that displaced workers remain unemployed for one year on average, and that all layoffs and compliance related investments occur over the first three years after promulgation. Table XVI–17 shows the timing of projected employment impacts, and the net effect on employment over 15 years. (EPA's estimates of the employment effects of the proposed rule are presented in Chapter 6 of the EEBA.)

TABLE XVI–17.—ESTIMATED DIRECT NET IMPACTS ON EMPLOYMENT OVER 15 YEARS, PROPOSED RULE

[Number of FTEs per year and total FTE-years]

Year	One-time manufacturing and installation [a]	Annual O&M [a]	Closures [b]	Net change in employment
1	1,496	95	1,972	(381)
2	1,496	190	1,972	(286)
3	1,496	286	1,972	(190)
4	.....	286	.....	286
5	.....	286	.....	286
6	.....	286	.....	286
7	.....	286	.....	286
8	.....	286	.....	286
9	.....	286	.....	286
10	.....	286	.....	286
11	.....	286	.....	286
12	.....	286	.....	286
13	.....	286	.....	286
14	.....	286	.....	286
15	.....	286	.....	286
Total FTE-years over 15 years	4,488	4,003	5,916	2,575

[a] Assumes that one-third of facilities come into compliance in each of 3 years.
[b] Assumes that one-third of the facilities projected to close do so in each of the first 3 years.

EPA calculated a range of social costs of changes in employment under the proposed rule, with the lower bound reflecting no net loss of employment and the upper bound considering only the 5,916 job losses resulting from closures. The social costs associated with unemployment were therefore estimated to range from zero to $78.0 million, including an upper-bound $77.9 million in worker's willingness to pay to avoid involuntary unemployment and less than $0.1 million in the additional costs of administering unemployment benefits. The estimated upper-bound employment-related social cost is likely to be substantially overstated, since it does not consider the social value of net increases in employment due to compliance activities and the increases in production that may occur at MP&M facilities that continue to operate post-compliance.

5. Total Social Costs

Summing across all social costs results in a total social cost estimate of $2.0 to $2.1 billion annually ($1999), as shown in Table XVI–18. This estimate represents an upper bound value of social costs, since it assumes that all facilities remain open and incur compliance costs rather than closing in some cases. This assumption is made only to calculate the resource value of compliance expenditures; closures are considered in calculating the social cost of unemployment.

TABLE XVI–18.—ANNUAL SOCIAL COSTS OF THE PROPOSED RULE

[Million $1999, annualized @ 7%]

Social cost category	Lower bound estimate	Upper bound estimate
Resource Value of Compliance Costs (before-tax)	$2,033.7	
Government Administrative Costs	$0.1	$0.9
Social Costs of Unemployment	0	$78.0

TABLE XVI–18.—ANNUAL SOCIAL COSTS OF THE PROPOSED RULE—Continued

[Million $1999, annualized @ 7%]

Social cost category	Lower bound estimate	Upper bound estimate
Total Social Costs	$2,033.8	$2,122.6

XVII. Cost-Effectiveness Analysis

A. Methodology

EPA performed a cost-effectiveness analysis of the alternative regulatory options for indirect dischargers (PSES) and direct dischargers (BAT). Cost-effectiveness analysis is used in the development of effluent limitations guidelines to evaluate the relative efficiency of alternative regulatory options in removing toxic pollutants from the effluent discharges to the nation's waters.

The cost-effectiveness of a regulatory option is defined as the incremental annual cost (in 1981 constant dollars) per incremental toxic-weighted pollutant removals for that option. This definition includes the following concepts:

• *Toxic-weighted removals.* Pollutants differ in their toxicity. Therefore, the estimated reductions in pollution discharges, or pollutant removals, are adjusted for toxicity by multiplying the estimated removal quantity for each pollutant by a normalizing toxic weight (Toxic Weighting Factors). The toxic weight for each pollutant measures its toxicity relative to copper, with more toxic pollutants having higher toxic weights. The use of toxic weights allows the removals of different pollutants to be expressed on a constant toxicity basis as toxic pound-equivalents (lb-eq). The removal quantities for the different pollutants may then be summed to yield an aggregate measure of the reduction in toxicity-normalized pollutant discharges that is achieved by a regulatory option. The cost-effectiveness analysis does not address the removal of conventional pollutants (oil and grease, biochemical oxygen demand, and total suspended solids), nor does it address the removal of bulk parameters, such as COD.

• *Annual costs.* The costs used in the cost-effectiveness analysis are the estimated annualized before-tax costs to comply with the alternative regulatory options. The cost to facilities to remove these pollutants will be less because the costs are tax deductible. The annual costs include the annual expenses for operating and maintaining compliance equipment, meeting monitoring requirements, and some pollution prevention activities. Annualized components include capital outlays for treatment systems.

• *Incremental calculations.* The incremental values are the changes in total annual compliance costs and changes in removals from the next less stringent option, or from the baseline if there is no less stringent option, where regulatory options are ranked by increasing levels of toxic-weighted removals. The resulting cost-effectiveness values for a given option are therefore expressed relative to another option or, for the least stringent option considered, relative to the baseline.

The result of the cost-effectiveness calculation represents the unit cost of removing the next pound-equivalent of pollutants and is expressed in constant 1981 dollars per toxic pound-equivalent removed ($/lb-eq) to allow comparisons with other options being considered. Although not required by the Clean Water Act, cost-effectiveness analysis is a useful tool for evaluating regulatory options that address toxic pollutants.

EPA performed the cost-effectiveness analysis for the MP&M regulation separately for indirect dischargers (subject to PSES) and direct dischargers (subject to BAT). The following sections summarize the results for the two classes of facilities. EPA notes that for all subcategories, it is proposing options only BPT or is setting BAT equal to BPT, as there is no additional technology used at BAT. The Agency does not use C–E analysis to assess options for BPT. Therefore, the C–E analysis for direct dischargers is presented only for informational purposes. See Section IX for a discussion of BPT cost-reasonableness.

B. Cost-Effectiveness Analysis for Indirect Dischargers

Table XVII–1 summarizes the cost-effectiveness analysis for the PSES regulatory options applicable to indirect dischargers. Annual compliance costs are shown in 1999 dollars and also in 1981 dollars. The regulatory options are listed in order of increasing stringency on the basis of the estimated toxic-weighted pollutant removals. Estimates of costs and pollutant removals do not include facilities that close in the baseline. (See Section XVI.B.4 for a discussion on the baseline closure analysis.)

TABLE XVII–1.—COST-EFFECTIVENESS FOR INDIRECT DISCHARGERS

Regulatory option	Annual before-tax compliance costs (excluding regulatory closures)			Weighted pollutant removals		Cost-effectiveness ratio ($1981/lb-eq)
	Total cost (million $1999)	Total cost (million $1981)	Incremental cost (million $1981)	Total removals (000 lbs-eq)	Incremental removals (000 lbs-eq)	
Proposed Option	1,730.1	1,009.2	1,009.2	9,372.3	9,372.3	108
Option 2/6/10	2,421.9	1,412.8	403.6	9,755.5	383.2	1,053
Option 4/8	3,795.1	2,213.8	801.0	9,936.9	181.4	4,416

As shown in Table XVII–1, the proposed option removes 9.4 million toxic-weighted pounds. The proposed option is the least stringent of those considered, and the incremental and average cost-effectiveness is $108 per pound-equivalent removed.

Option 2/6/10 would remove an additional 0.4 million toxic weighted pounds, at an incremental cost of $0.38 billion ($1981), for an incremental cost-effectiveness ratio of $1,053 per pound-equivalent removed. The differences between the proposed option and Option 2/6/10 for indirect dischargers

include the proposed option's one million gallon per year cutoff for the General Metals subcategory, two million gallon per year cutoff for the Oily Wastes subcategory, and exclusion of new pretreatment standards for the Non-Chromium Anodizing, Railroad Line Maintenance and Shipbuilding Dry Dock subcategories. These provisions of the proposed rule reduce before-tax compliance costs by 40 percent compared with Option 2/6/10, while losing 4 percent of the pound-equivalents removed. EPA discussed the rationale for the selected flow cutoffs for each subcategory in Section XII of today's proposal.

Option 4/8 would remove an additional 0.18 million pound-equivalents, as compared with Option 2/6/10, at an additional cost of $0.8 billion ($1981), or $4,416 per pound-equivalent.

Table XVII–2 presents the results of the cost-effectiveness analysis for indirect dischargers by subcategory.

TABLE XVII–2.—COST-EFFECTIVENESS FOR INDIRECT DISCHARGERS BY SUBCATEGORY

Subcategory and regulatory option	Incremental before-tax compliance cost (million $1981)	Incremental removals (lbs-eq)	Cost-effectiveness ratio ($1981/lb-eq)
Printed Wiring Boards			
Proposed Option	81.17	1,195,260	68
Option 2/6/10	.....	.....	.....
Option 4/8	40.87	8,010	5,103
Metal Finishing Job Shops			
Proposed Option	68.82	1,766,063	39
Option 2/6/10	.....	.....	.....
Option 4/8	26.54	62,554	424
General Metals			
Proposed Option	844.52	6,216,887	136
Option 2/6/10	279.12	318,594	876
Option 4/8	487.21	103,514	4,707
Non-Chromium Anodizing			
Proposed Option	.....	.....	.....
Option 2/6/10	15.23	13,598	1,120
Option 4/8	7.27	434	16,756
Oily Wastes			
Proposed Option	2.52	14,140	178
Option 2/6/10	109.04	51,008	2,138
Option 4/8	232.35	5,885	39,484
Railroad Line Maintenance			
Proposed Option	.....	.....	.....
Option 2/6/10	0.15	17	8,560
Option 4/8	0.13	132	995
Shipbuilding Dry Dock			
Proposed Option	.....	.....	.....
Option 2/6/10	0.10	0	767,794
Option 4/8	0.00	26	0
Steel Forming and Finishing			
Proposed Option	12.19	179,900	68
Option 2/6/10	.....	.....	.....
Option 4/8	6.63	865	7,659

The proposed option for indirect dischargers in the Printed Wiring Board, Metal Finishing Job Shops, and Steel Forming and Finishing subcategories is the same as Option 2/6/10. The proposed option includes a flow cutoff of one million and two million gallons per year for General Metals and Oily Wastes, respectively. Therefore, there are no proposed pretreatment standards for all indirect dischargers that fall below those cutoffs. There are also no proposed pretreatment standards for indirect dischargers in the Non-Chromium Anodizing, Railroad Line Maintenance and Shipbuilding Dry Dock subcategories. In developing regulatory options for indirect dischargers, EPA considered a range of possible exclusions from 1 mgy to 6.25 mgy for all subcategories. Information of

the cost-effectiveness for each regulatory option under each flow cutoff by subcategory can be found in ''Analysis of Cost-Effectiveness by Flow Category'', which is available in the rulemaking docket.

C. Cost-Effectiveness Analysis for Direct Dischargers

Table XVII–3 summarizes the cost-effectiveness analysis for the BAT regulatory options applicable to direct dischargers and Table XVII–4 presents the analysis by subcategory. As before, regulatory options are ranked in order of increasing stringency.

TABLE XVII–3.—COST EFFECTIVENESS FOR DIRECT DISCHARGERS

Regulatory option	Annual before-tax compliance costs (excluding regulatory closures)			Weighted pollutant removals		Cost-effectiveness ratio ($1981/lb-eq)
	Total cost (million $1999)	Total cost (million $1981)	Incremental cost (million $1981)	Total removals (000 lbs-eq)	Incremental removals (000 lbs-eq)	
Proposed Option	245.8	143.4	143.4	$1,333.6	1,333.6	107
Option 2/6/10	245.8	143.4	0.0	1,333.6	0.0	.....
Option 4/8	381.6	222.6	79.2	1366.7	33.1	2,391

The proposed BAT option for direct dischargers achieves removal of 1.3 million pounds on a toxic-weighted basis, with a cost-effectiveness of $107 ($1981). Because the only differences between Option 2/6/10 and the proposed option occur for indirects (i.e. flow cutoffs and no regulation options), Option 2/6/10 is the same as the proposed option for direct dischargers.

Option 4/8 would remove an additional 33,000 pound-equivalents, as compared with the proposed option, at an additional cost of $80 million ($1981), or $2,391 per pound-equivalent.

Table XVII–4 presents the results of the cost-effectiveness analysis for direct dischargers by subcategory.

TABLE XVII–4.—COST-EFFECTIVENESS FOR DIRECT DISCHARGERS BY SUBCATEGORY

Subcategory and regulatory option	Incremental before-tax compliance cost (million $1981)	Incremental removals (lbs-eq)	Cost-effectiveness ratio ($1981/lb-eq)
Printed Wiring Boards			
Proposed Option	1.42	64,573	22
Option 2/6/10	.....	.....	.....
Option 4/8	1.14	2,270	501
Metal Finishing Job Shops			
Proposed Option	0.69	14,194	49
Option 2/6/10	.....	.....	.....
Option 4/8	0.52	265	1,968
General Metals			
Proposed Option	114.54	899,372	127
Option 2/6/10	.....	.....	.....
Option 4/8	52.20	21,620	2,414
Non-Chromium Anodizing*			
Proposed Option	NA	NA	.....
Option 2/6/10	NA	NA	.....
Option 4/8	NA	NA	.....
Oily Wastes			
Option 4/8	**	**	**
Proposed Option	6.42	16,069	399
Option 2/6/10	0.00	0	.....
Railroad Line Maintenance			
Proposed Option	0.67	174	3,831
Option 2/6/10	.....	.....	.....
Option 4/8	0.05	23	2,181
Shipbuilding Dry Dock			
Proposed Option	1.24	111	11,179

TABLE XVII–4.—COST-EFFECTIVENESS FOR DIRECT DISCHARGERS BY SUBCATEGORY—Continued

Subcategory and regulatory option	Incremental before-tax compliance cost (million $1981)	Incremental removals (lbs-eq)	Cost-effectiveness ratio ($1981/lb-eq)
Option 2/6/10	.....	.....	.....
Option 4/8	*** −0.91	*** 335	*** −2,728
Steeling Forming and Finishing			
Proposed Option	18.39	339,147	54
Option 2/6/10	.....	.....	.....
Option 4/8	1.28	8,977	143

* EPA estimates that there are no direct discharging Non-Chromium Anodizing facilities.
** Option 4/8 removes 15,703 lbs equivalent at a cost of $31.34 million. The proposed option removes more lbs equivalent at a lower cost. The proposed option therefore dominates Option 4/8, and results are not shown here for Option 4/8.
*** Option 4/8 removes more lb-eq. than the proposed option at a lower cost. See Section XVII-D for a discussion of the impacts of the proposed option on conventional pollutant removals. Option 4/8 removes 446 lbs-equivalent at a cost of $0.33 million at an average cost-effectiveness incremental to baseline of $740/lb-eq.

The proposed option is more stringent than Option 4/8 for the Oily Wastes subcategory, in that it removes more toxic-weighted pounds of pollutants and costs less than Option 4/8. It therefore dominates Option 4/8 from the perspective of toxic pollutant removals, and has an average cost per pound-equivalent removed of $399 ($1981). Again, EPA is proposing options only for BPT or is setting BAT equal to BPT for all subcategories, as there is no additional technology used at BAT. The Agency does not use C-E analysis to assess options for BPT. Therefore, the C-E analysis for direct dischargers is presented only for informational purposes.

Table XVII–4 shows a high cost-effectiveness for the Railroad Line Maintenance and the Shipbuilding Dry Dock subcategories. EPA is not proposing BAT limitations for these subcategories because of the small quantities of toxic pollutants in the wastewater from facilities in these subcategories. (See Section XI.) However, EPA is proposing BPT limitations for these subcategories in order to control the discharge of conventional pollutants. See Section IX for a discussion of BPT options selection and the results of the BPT cost-reasonableness analysis.

XVIII. Non-Water Quality Environmental Impacts

Sections 304(b) and 306 of the Act require EPA to consider non-water quality environmental impacts (including energy requirements) associated with effluent limitations guidelines and standards. In accordance with these requirements, EPA has considered the potential impact of the proposed regulation on energy consumption, air emissions, and solid waste generation.

While it is difficult to balance environmental impacts across all media and energy use, the Agency has determined that the impacts identified below are justified by the benefits associated with compliance with the limitations and standards (see Sections XIX and XX for a discussion on the environmental benefits associated with this proposed regulation).

A. Air Pollution

The Agency believes that the in-process and end-of-pipe technologies included in the technology options for this regulation do not generate air emissions. (See Section VIII for a discussion of the technology options.)

The use of halogenated hazardous air pollutant solvent (methylene chloride, perchloroethylene, trichloroethylene, 1,1,1 trichloroethane, carbon tetrachloride and chloroform) for cleaning in the MP&M industry can create hazardous air pollutant emissions. The Agency believes this regulation will not affect the use of halogenated hazardous air pollutant solvent in the MP&M industry. This regulation neither requires nor discourages the use of aqueous cleaners in lieu of halogenated hazardous air pollutant solvent.

The Agency is developing National Emission Standards for Hazardous Air Pollutants (NESHAPs) under section 112 of the Clean Air Act (CAA) to address air emissions of the hazardous air pollutants (HAPs) listed in Title III of the CAA Amendments of 1990. Below, EPA lists the current and upcoming NESHAPs that may potentially affect HAP emitting activities at MP&M facilities:

- Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks;
- Halogenated Solvent Cleaning;
- Aerospace Manufacturing;
- Shipbuilding and ship repair (Surface Coating);
- Large appliances (Surface Coating);
- Metal Furniture (Surface Coating);
- Automobile and light-duty truck manufacturing (Surface Coating); and
- Miscellaneous Metal Parts and Products (Surface Coating).

B. Solid Waste

Solid waste generation includes hazardous and nonhazardous wastewater treatment sludge as well as waste oil removed in wastewater treatment. EPA estimates that compliance with this regulation will result in a decrease in wastewater treatment sludge and an increase in waste oil generated at MP&M facilities.

According to EPA's detailed questionnaires, the Agency estimates that MP&M facilities generate 267 million gallons (4 million cubic yards) of wastewater treatment sludge and 805 million gallons of waste oil from the treatment of wastewater. In Table XVIII.B–1, EPA presents the amount of wastewater treatment sludge and waste oil expected to be generated at the selected technology option. The table also shows the amount of wastewater treatment sludge and waste oil that would be generated by the selected technology option if EPA had not included pollution prevention as part of its selected technology option.

TABLE XVIII.B–1.—WASTE TREATMENT SLUDGE AND OIL GENERATION BY OPTION

Option	Wastewater treatment sludge generated (million gallons/year)	Waste oil generated (million gallons/year)
Baseline[1]	267	805
Proposed Options without water conservation and P2	207	2,000
Proposed Options with water conservation and P2	206	1,600

Source: U.S. Environmental Protection Agency.
[1] EPA calculated the baseline sludge and waste oil generation using responses to the 1989 MP&M Phase I Questionnaire and the 1996 MP&M Phase II Detailed Questionnaires.

As shown in Table XVII.B–1, wastewater treatment sludge generation decreased from baseline to the selected option without in-process flow control. EPA attributes the net decrease to the fact that this option includes sludge dewatering, which may result in a significant decrease in sludge generation for sites that have chemical precipitation and settling technologies without sludge dewatering in place at baseline. The Agency did not estimate additional sludge reduction at facilities which already have sludge dewatering in place at baseline. EPA does expect an increase of sludge production at MP&M facilities which do not have treatment in place and must install treatment as a result of the MP&M rule.

Table XVIII.B–1 shows that the water conservation and pollution prevention technologies included in the proposed options further reduce the amount of sludge generated. EPA expects these technologies to result in sludge reduction for the following reasons:

—Recycling of coolants and recycling of paint curtains reduce the mass of pollutants in treatment system influent streams, which in turn reduces the amount of sludge generated during metals removal;

—Bath maintenance practices, including good operational practices regarding drag out in plating processes, included in the proposed options, reduce the mass of metal pollutants discharged to treatment, which in turn reduces the amount of sludge generated during metals removal; and

—Water conservation technologies included in the proposed options reduces the discharge mass of metals present in the source water to a site (*e.g.,* calcium, sodium), which in turn reduces the amount of sludge generated during removal of these metals.

EPA classifies many of the sludges generated at MP&M facilities as either a listed or characteristic hazardous waste under the Resource Conservation and Recovery Act (RCRA) based on the following information:

—If the facility performs electroplating operations, EPA classifies the resulting sludge as an EPA hazardous waste number F006 (40 CFR 261.31). If the facility mixes the wastewater from these electroplating operations with other non-electroplating wastewater for treatment, then EPA still considers all of the sludge generated from the treatment of this commingled wastestream to be a listed hazardous waste F006, or

—If the sludge or waste oil from wastewater treatment exceeds the standards for the Toxicity Characteristic (*i.e.,* is hazardous), or exhibits other RCRA-defined hazardous characteristics (*i.e.,* reactive, corrosive, or flammable), EPA considers it a characteristic hazardous waste (40 CFR 261.24.)

It is also important to note that EPA does not include chemical conversion coating, electroless plating, and printing circuit board manufacturing under the F006 listing (51 FR 43351, December 2, 1986). And if the facility performs certain chemical conversion coating operations on aluminum, EPA classifies the resulting sludge as EPA hazardous waste number F019.

Additional federal, state, and local regulations may result in MP&M sludges being classified as hazardous wastes. Facilities should check with the applicable authorized (State or EPA Regional) authority to determine if other regulations apply.

Based on information collected during site visits and sampling episodes, the Agency believes that some of the solid waste generated would not be classified as hazardous. However, for purposes of compliance cost estimation, the Agency assumed that all solid waste generated as a result of the technology options would be hazardous.

As stated above in Section XV, EPA expects that the rule will reduce metal contaminants in the sludges generated by POTWs and will allow POTWs to dispense of the lower metal content sludge by more environmentally beneficial methods.

EPA attributes the increase in waste oil generation from baseline to the proposed option to the removal of oil from MP&M wastewater prior to discharge to POTWs or surface waters. MP&M facilities usually either recycle waste oil on site or off site, or contract haul it for disposal as either a hazardous or nonhazardous waste. The estimated increase of waste oil generation as a result of the MP&M proposed rule reflects a better removal of oil and grease by the proposed technology options than that being achieved at baseline and does not reflect an increase in overall oil generation at MP&M facilities. For the purpose of compliance cost estimation, EPA assumed that all MP&M facilities contract hauled waste oil for disposal; however, EPA expects that some facilities may recycle waste oil either on site or off site.

Table XVIII.B–1 shows that the inclusion of water conservation and pollution prevention in the proposed option results in the generation of less waste oil. EPA attributes this decrease in waste oil generation to the 80 percent reduction of coolant discharge using the recycling technology included in the proposed technology train. This system recovers and recycles oil-bearing machining coolants at the source, reducing the generation of spent coolant.

C. Energy Requirements

EPA estimates that compliance with this regulation will result in a net increase in energy consumption at MP&M facilities. EPA presents the estimates of increased energy usage for the selected option in Table XVIII.C–1. The table also shows the amount of energy that would be required by the selected technology option if EPA had not included pollution prevention as part of its selected technology option. The in-process flow control and recycling technologies included in

EPA's proposed options reduce the amount of water use and in doing so also require energy. Therefore, the amount of energy required for the selected option incorporating pollution prevention and water conservation was slightly greater than the proposed option without pollution prevention and water conservation techniques.

TABLE XVIII.C–1.—ENERGY REQUIREMENTS BY OPTION

Option	Energy required (million kilowatt hrs/yr)
Baseline [1]	248
Proposed Options without water conservation and P2	347
Proposed Options without water conservation and P2	364

Source: U.S. Environmental Protection Agency.

[1] EPA calculated the baseline sludge and waste oil generation using responses to the 1989 MP&M Phase I Questionnaire and the 1996 MP&M Phase II Detailed Questionnaires.

By comparison, electric power generation facilities generated 3,123 billion kilowatt hours of electric power in the United States in 1997 (The Energy Information Administration, Electric Power Annual 1998 Volume 1, Table A1). Additional energy requirements for EPA's proposed options correspond to approximately 0.01 percent of national requirements. The increase in energy requirements due to the implementation of MP&M technologies will in turn cause an air emissions impact from the electric power generation facilities. The increase in air emissions is expected to be proportional to the increase in energy requirements or approximately 0.01 percent.

TABLE XVIII.C–1.—ENERGY REQUIREMENTS BY OPTION

Option	Energy required (million kilowatt hrs/yr)
Baseline [1]	248
Proposed Options without water conservation and P2	347
Proposed Options without water conservation and P2	364

Source: U.S. Environmental Protection Agency.

[1] EPA calculated the baseline sludge and waste oil generation using responses to the 1989 MP&M Phase I Questionnaire and the 1996 MP&M Phase II Detailed Questionnaires.

By comparison, electric power generation facilities generated 3123 billion kilowatt hours of electric power in the United States in 1997 (The Energy Information Administration, Electric Power Annual 1998 Volume 1, Table A1). Additional energy requirements for EPA's proposed options correspond to approximately 0.01 percent of national requirements. The increase in energy requirements due to the implementation of MP&M technologies will in turn cause an air emissions impact from the electric power generation facilities. The increase in air emissions is expected to be proportional to the increase in energy requirements or approximately 0.01 percent.

XIX. Water Quality, Sewage Sludge, and Other Environmental Impacts

A. Introduction

MP&M facilities nationwide currently discharge an estimated 5,025 million pounds of pollutants per year to publicly-owned treatment works (POTWs) and approximately 410 million pounds of pollutants directly to surface waters. MP&M facility effluents contain 42 priority or toxic pollutants, 86 nonconventional pollutants, and three conventional pollutants (biological oxygen demand (BOD), total suspended solids (TSS), and oil and grease (O&G)).

The release of these pollutants to our nation's surface water degrades aquatic environments, alters aquatic habitats, and affects the diversity and abundance of aquatic life. It can also increase the risks to the health of humans who ingest contaminated surface waters or eat contaminated fish and shellfish. A number of the pollutants commonly found in MP&M effluents also inhibit biological wastewater treatment systems or accumulate in sewage sludge.

Metals are a particular concern because of their prevalence in MP&M effluents. Metals are inorganic compounds that are generally non-volatile (with the notable exception of mercury) and are not broken down by biodegradation processes. Metals can accumulate in biological tissues, sequester into POTW sewage sludge, and contaminate soils and sediments when released to the environment. Some metals are quite toxic even when present at relatively low levels.

Of the 131 MP&M pollutants of concern for which loadings were estimated, 35 exhibit moderate to high toxicity to aquatic life; 77 are human non-cancer toxicants; 13 are classified as known or probable human carcinogens; 46 bioaccumulate in aquatic organisms and persist in the environment, and 35 are hazardous air pollutants (HAPs). HAPs are compounds which EPA believes may represent an unacceptable risk to human health if present in the air.

B. Beneficial Impacts of the MP&M Proposed Rule

Changes under the proposed rule include:

- Water quality changes;
- Reduced aquatic life impacts;
- Reduced POTW inhibitions;
- Reduced costs for sewage sludge disposal; and
- Reduced human health impacts.

The first three changes due to the proposed rule are discussed in this section, and the last two are discussed in Section XX. EPA estimated these changes for three options. This section presents results for the proposed option, Option 2/6/10 and Option 4/8. See Section VIII for a description of the options. Results are discussed for only the proposed option, however, to reduce the length of the document. Benefits were not estimated for Options 1, 3, 5, 7, and 9 (options without pollution prevention) because these options remove fewer pollutants and cost more than Option 2/6/10 and Option 4/8.

1. Water Quality Changes

EPA estimates that the proposed rule would substantially reduce pollutant discharges to the waters of the U.S. as shown by the loadings estimates in Table XIX–1 for five categories of pollutants. The regulation would result in total pollutant removals of 3,872 million pounds per year. These removals include a 30 million pound per-year reduction in eight sewage sludge contaminants and a 703 million pound per-year reduction in 89 pollutants causing inhibition of biological activity of sewage sludge. The regulation would reduce discharges of 35 HAPs by about one million pounds per-year. Discharges of pollutants that are known to be related to adverse acute and chronic effects on aquatic life would be reduced by 823 and 1,035 million pounds per year, respectively. These reductions result from increased wastewater treatment, pollution prevention, and regulatory closures. EPA estimated impacts of MP&M discharges on the quality of receiving waters using a model of the in-stream pollutant mixing and dilution process. A first order pollutant degradation model was used in the analysis of source water concentrations at the drinking water intake points. This model estimates in-stream concentrations for the initial discharge reach (*i.e.,* waterway) and for downstream reaches, taking into account dilution, adsorption, volatilization, and hydrolysis.

This analysis uses discharge information from 885 sample MP&M

facilities (excluding two sample facilities in Puerto Rico) that discharge directly or indirectly to 627 receiving waterways (544 rivers/streams, 55 bays/estuaries, and 28 lakes). Four of the 55 marine reaches were excluded from the in-stream water quality analysis due to data limitations.

EPA extrapolated the environmental assessment results for the sample facilities to the entire population of MP&M facilities nationwide. This extrapolation uses sample facility weights developed as part of the sampling plan. For additional information on sample weights see the Statistical Summary for the Metal Products & Machinery Industry Surveys in the Administrative record for today's rule.

EPA evaluated the national environmental impacts of reducing pollutant discharges from MP&M facilities to the nation's waterbodies for the proposed rule and for two alternative regulatory options. EPA considered only pollutant loadings from MP&M facilities to particular waterbodies and did not take background loadings from other sources into account, with one exception. The analysis of sewage sludge (biosolids) quality took background metal loadings into account. EPA used information from the POTW survey to estimate total metal loadings to a POTW of a given size (*i.e.,* small, medium, and large). See Section V.B for a description of the POTW survey. This estimate was based on the average number of small, medium, and large MP&M facilities discharging to a POTW in each size category and the percent contribution of total metal loadings discharged from MP&M facilities.

2. Reduced POTW Impacts

EPA evaluated whether MP&M pollutants may interfere with publicly-owned treatment works (POTWs). Pollutants may impair POTW treatment effectiveness by inhibiting the biological activity of activated sludge. POTW inhibition and sludge values come from guidance published by EPA and other sources. The Agency also evaluated the reduced costs for managing and disposing of sewage sludge containing fewer pollutants or lower concentrations of pollutants. This is discussed in Section XX.D of today's proposal.

EPA estimated inhibition of POTW operations by comparing predicted POTW influent concentrations to available inhibition levels for 89 pollutants. At baseline discharge levels, EPA estimates that concentrations of 18 pollutants discharged from MP&M facilities exceed biological inhibition criteria at 515 POTWs nationwide. The proposed regulation would eliminate potential inhibition problems at 306 POTWs and reduce occurrence of pollutant concentrations in excess of inhibition criteria at 82 POTWs. POTWs may impose local limits to prevent inhibitions. If local limits are in place, the estimated reduction in potential inhibition problems at the affected POTWs is overstated. In this case, however, the estimated social cost of the MP&M regulation is also overstated.

3. Reduced Aquatic Life Impacts

EPA assessed the effect of baseline and post-compliance MP&M facility discharges on affected waterways by estimating the cases in which in-waterway pollutant concentrations resulting from those discharges would exceed recommended acute and chronic Ambient Water Quality Criteria (AWQC) that protect aquatic life. Acute toxicity assesses the impacts of a pollutant from relatively short exposures, typically 48 and 96 hours for invertebrates and fish, respectively. Mortality is the endpoint of concern. Chronic toxicity assesses the impact of a pollutant after a longer exposure, typically from one week to several months. The endpoints of concern are one or more sublethal responses, such as changes in reproduction or growth in the affected organisms. Pollutant concentrations in excess of acute and chronic AWQC values indicate potential impacts to aquatic life.

The analysis compared baseline and post-compliance exceedences of aquatic life AWQC to determine the effects of the rule. These exceedences were modeled based on the estimated discharges from MP&M facilities and 7Q10 stream flow rates (7Q10 refers to the lowest consecutive seven day average with a recurrence interval of 10 years). Results show that baseline pollutant concentrations exceed acute AWQC in 878 reaches and chronic AWQC in 2,466 reaches nationally at baseline discharge levels. EPA estimates that the proposed option will eliminate concentrations in excess of acute and chronic criteria in 775 and 1,029 reaches, respectively. Results also show that an additional 903 receiving reaches will experience partial water quality improvements from reduced occurrence of some pollutant concentrations in excess of acute and/or chronic AWQC limits for protection of aquatic life.

TABLE XIX.1.—NATIONAL ESTIMATES OF MP&M FACILITY DISCHARGES

Category	MP&M discharges with potential POTW impacts			MP&M discharges exhibiting toxicity Aquatic Life	
	Activated sludge inhibition	Biosolids contaminants	HAP	Acute	Chronic
Baseline Loadings					
Number of Pollutants	89	8	35	107	116
Million lbs/yr	1,031	31.7	2.1	1,252	1,759
Remaining With the Proposed Option					
Million lbs/yr	328	1.61	1.11	430	723
Remaining With Option 2/6/10					
Million lbs/yr	266	0.54	0.89	364	647
Remaining With Option 4/8					
Million lbs/yr	484	0.43	1.05	595	895

TABLE XIX–2.—NATIONAL ESTIMATES OF MP&M POLLUTANTS, EXCEEDENCES & REDUCTIONS

	Baseline	Proposed option	Option 2/6/10	Option 4/8
POTW Impacts				
Number of POTWs with Inhibition Problems (18 pollutants > inhibition criteria)	515	209	123	123
Biosolids Contamination (8 pollutants):				
Number of POTWs	6,953	6,889	5,575	5,575
Non-qualifying Sewage Sludge (mill. of dry metric tons)	53.7	52.5	47.6	47.6
Receiving Water Impacts				
Number of Streams with Human Health AWQC Exceedences				
Number of pollutants:				
Water and organisms [a]	18	11	11	13
Organisms only [b]	6	5	5	5
Number of streams > AWQC for water and organisms	10,310	9,205	4,151	4,160
Number of streams > AWQC for organisms only	192	71	71	65
Number of Streams with Aquatic Life AWQC Exceedences				
Number of pollutants:				
Chronic	31	25	21	17
Acute	10	11	8	6
Number of streams > AWQC chronic	2,466	1,437	1,394	1,310
Number of streams > AWQC acute	878	103	61	52

[a] Both drinking water and organism consumption are considered in developing these AWQC exceedences.
[b] Only consumption of aquatic organisms is considered in these AWQC exceedences.

XX. Benefit Analysis

A. Overview of Benefits

This section presents EPA's estimates of the national environmental benefits of the proposed MP&M effluent guidelines. The benefits occur due to the reduction in facility discharges described in the preceding section. EPA's complete benefit assessment can be found in ''Economic, Environmental, and Benefit Assessment of Proposed Metal Products and Machinery (MP&M) Rule.''

Benefits analyses for past effluent guidelines have been limited in the range of benefits addressed, which has hindered EPA's ability to compare the benefits and costs of rules comprehensively. The Agency is working to improve its benefits analyses, including applying methodologies that have now become well established in the natural resources valuation field, but have not been used previously in the effluent guidelines program. EPA was particularly interested in expanding its benefits analyses for this rule to include water-based recreational activities other than fishing. The proposed MP&M rule addresses an industry with a large number of facilities located throughout the United States. These facilities are largely concentrated near large population centers and recreational sites.

Individuals in the U.S. are known to participate in a wide range of water-based recreational activities including fishing, swimming, boating, and near water activities such as wildlife viewing. Participation rates in each activity vary significantly from state to state depending on the availability and quality of water resources suitable for recreation, climate, and demographic characteristics of the user population. Wildlife viewing is most popular type of water-based recreation followed by fishing and swimming. The 1996 U.S. Fish and Wildlife Service survey showed that 62 million Americans enjoy wildlife viewing nationwide. In addition, 35 to 43 million people participate in recreational fishing and 34 million people take boating trips.

EPA has therefore expanded upon its traditional methodologies in the benefits analyses for the proposed MP&M rule. Past effluent guidelines analyses have included human health benefits, economic productivity benefits such as reduced costs for POTW sludge disposal, recreational benefits for fishing, and nonuse values. The additional analyses expands on the traditional analyses by estimating benefits to participants in boating, swimming and viewing (i.e., near-water recreation.) EPA used a benefit transfer approach based on four studies to estimate the increase in value to individuals who boat and participate in viewing or near-water recreation at the national level. Three of these studies have been published in established economic journals, the other study is new and specific to the MP&M guideline. For this rule, EPA also conducted an original travel cost study in the State of Ohio, using the National Recreational Demand Survey (NDS) and a Random Utility Model (RUM) of recreational behavior, to estimate the changes in consumer valuation of water resources that would result from improvements in water quality. This study is presented in detail in Chapter 21 of the EEBA. A preliminary application of the travel cost study was reviewed by experts in the field of natural resource valuation, and the study has been presented at two professional meetings and will be subjected to a formal peer review in the coming year. The results of the previous review are available in the docket.

Because EPA has not yet resolved some anomalies in the extrapolation of these analyses to the national level, the monetized benefits for these new categories are not included in the summary statements of benefits for the proposed rule. EPA is including these analyses in the EEBA, however, to present the new methodologies and their results as applied to the MP&M rule for public comment, concurrent with seeking peer review of the travel cost study.

The new analyses projects benefits of $500–$900 million for enhanced wildlife viewing, $265–$672 million for recreational boating, and $191 to $1,066 million in additional non-use benefits (calculated as ¼ to ⅔ of the additional recreational use benefits.) EPA notes that the methodology used results in projected benefits for 57 million wildlife viewers taking an average of 10 trips per year. This estimate (567 viewing days) is essentially the total number of single day trips as estimated by the national recreational demand survey (NDS). The methodology also predicts that 33 million individuals will each take an average 9 boating trips per year to sites benefiting from the rule. This amounts to 296 million boating days which is essentially all of the single day boating days nationally estimated from the NDS. Even though only about 5% of total reaches nationally are projected to benefit from the rule, 90% of the benefitting reaches are located in densely populated areas in the U..S, which is where the majority of the U.S. population and recreational users are located, though not necessarily where they recreate. Although EPA is confident in the sample based results, EPA believes that the large numbers of viewers and boaters projected to benefit from the rule at the national level may indicate a need to revise its procedures for scaling up from sampled facilities to the national level. The simple extrapolation technique used in both the cost and benefit analyses, may have the unintended effect of overcounting the number of benefitting boaters and wildlife viewers. EPA is also specifically soliciting comment on several other methodological approaches used in new analyses including the benefits transfer of values from studies that did not specifically address boating and wildlife viewing to these activities, the extent to which activities such as recreational boating, and wildlife viewing are applicable to children, and the effect of omitting other non-MP&M sources of impairment on affected reaches from the analyses.

EPA may include additional categories of monetized benefits estimates based on these new methodologies, as revised based on comment and peer review, in its economic analyses of the final rule.

Table XX.1 summarizes the benefits categories associated with the regulation and notes which categories EPA was able to quantify and monetize. The benefits include three broad classes: Human health, ecological, and economic productivity benefits. Within these three broad classes, EPA was able to assess benefits with varying degrees of completeness and rigor. Where possible, EPA quantified the expected effects and estimated monetary values. Data limitations and limited understanding of how society values certain water quality changes prevented monetizing some benefit categories. This section also presents a case study for the State of Ohio which provides more detailed analyses of the regulation's expected benefits.

TABLE XX–1.—BENEFIT CATEGORIES ASSOCIATED WITH WATER QUALITY IMPROVEMENTS RESULTING FROM THE METAL PRODUCTS AND MACHINERY EFFLUENT GUIDELINE

Benefit category	Quantified and monetized	Quantified and nonmonetized	Nonquantified and nonmonetized
Human Health Benefits			
Reduced cancer risk due to ingestion of chemically-contaminated fish and unregulated pollutants in drinking water	X		
Reduced systemic health hazards (e.g., reproductive, immunological, neurological, circulatory, or respiratory toxicity) due to ingestion of chemically-contaminated fish and unregulated pollutants in drinking water	.....	X	
Reduced systemic health hazards from exposure to lead from consumption of chemically-contaminated fish	X		
Reduced cancer risk and health hazards from exposure to unregulated pollutants in chemically-contaminated sewage sludge	.....	.....	X
Reduced health hazards from exposure to contaminants in waters used recreationally (e.g., swimming)	.....	.....	X
Ecological Benefits			
Reduced risk to aquatic life	.....	X	
Enhanced water-based recreation including fishing	X		
Enhanced water-based recreation including near-water or viewing and boating	X In expanded analyses		
Other enhanced water-based recreation such as swimming, waterskiing and white water rafting	.....	.....	X
Increased aesthetic benefits such as enhancement of adjoining site amenities (e.g. residing, working, traveling, and owning property near the water)	.....	.....	X
Nonuser value (i.e., existence, option, and bequest value)	X		
Reduced contamination of sediments	.....	.....	X
Reduced non-point source nitrogen contamination of water if sewage sludge is used as a substitute for chemical fertilizer on agricultural land	.....	.....	X
Satisfaction of a public preference for beneficial use of sewage sludge*	.....	.....	X
Economic Productivity Benefits			
Reduced sewage sludge disposal costs	X		
Reduced management practice and record-keeping costs for users of sewage sludge that meets exceptional quality criteria	.....	.....	X
Reduced interference with POTW operations	.....	X	
Benefits to tourism industries from increased participation in water-based recreation	.....	.....	X

TABLE XX–1.—BENEFIT CATEGORIES ASSOCIATED WITH WATER QUALITY IMPROVEMENTS RESULTING FROM THE METAL PRODUCTS AND MACHINERY EFFLUENT GUIDELINE—Continued

Benefit category	Quantified and monetized	Quantified and nonmonetized	Nonquantified and nonmonetized
Improved commercial fisheries yields	.....	.....	X
Addition of fertilizer to crops (nitrogen content of sewage sludge is available as a fertilizer when sludge is land applied)*	.....	.....	X
Improved crop yield (the organic matter in land-applied sewage sludge increases soil's water retention)*	.....	.....	X
Avoidance of costly siting processes for more controversial sewage sludge disposal methods (e.g., incinerators) because of greater use of land application	.....	.....	X
Reduced water treatment costs for municipal drinking water, irrigation water, and industrial process and cooling water	.....	.....	X

*Some of these benefit categories are accounted for and quantified under the ''reduced sewage sludge disposal costs.''

B. Reduced Human Health Risk

Reduced pollutant discharges from MP&M facilities generate human health benefits by a number of pathways. The most important human health benefits stem from reduced risk of illness from consumption of contaminated fish, aquatic organisms other than fish, and water. EPA analyzed human health benefits by estimating the change in the expected number of adverse human health events in the populations exposed to MP&M discharges. While some health effects such as cancer are relatively well understood and can be quantified and monetized in a benefits analyses, others such as systemic health effects are less well understood and may not be assessed with the same rigor or at all. (See Table XX–1.)

EPA analyzed the following measures of health-related benefits: reduced cancer risk from fish and water consumption; reduced risk of non-cancer toxic effects from fish and water consumption; lead-related health effects to children and adults; and reduced occurrence of in-waterway pollutant concentrations in excess of levels of concern. The levels of concern include human health-based ambient water quality criteria (AWQC) or documented toxic effect levels for those chemicals not covered by water quality criteria. The Agency monetized only two of these health benefits: (1) Changes in the incidence of cancer from fish and water consumption, and (2) changes in adverse health effects to children and adults from reduced lead exposure. The following discussion includes results only for the proposed option; however, the tables present the results for all options evaluated.

EPA estimates that the proposed option would eliminate approximately 2.29 cancer cases associated with consumption of MP&M pollutants in fish tissue and drinking water. The regulation would also result in the removal of 0.86 million pounds (1.9 toxic lb-eq.) per year of lead. In addition, there will be a 142 million pound reduction in 77 pollutants that are known to be related to a wide range of human health endpoints not quantified or monetized for this benefits analyses. Monetized health benefits are expected to result in $41.3 million (1999 $) in benefits due to decreased human health risks under the proposed option.

The analyses of changes in human health risk described in this and the following sections ignore the potential for joint effects of more than one pollutant. Each pollutant is dealt with in isolation and the individual effects are summed. Therefore, this approach does not account for the possibility that several pollutants may combine in a synergistic fashion to yield more or less adverse effects to human health than indicated by the simple sum of their individual effects.

1. Benefits from Reduced Incidence of Cancer Cases

EPA estimated aggregate cancer risk from contaminated drinking water for populations served by drinking water intakes on waterbodies to which MP&M facilities discharge. This analyses is based on seven carcinogenic pollutants for which no published drinking water criteria are currently available. This analyses excludes six carcinogens for which drinking water criteria are available. EPA assumed that public drinking water treatment systems will remove these pollutants from the public water supply. To the extent that treatment for these six pollutants may cause incidental removals of the chemicals without criteria, the analyses may overstate cancer related benefits.

Calculated in-stream concentrations serve as a basis for estimating changes in cancer risk for populations served by affected drinking water intakes. EPA estimates that the proposed regulation would eliminate annually 2.24 cancer cases associated with consumption of contaminated drinking water, or 44 percent of the cancer cases associated with baseline MP&M discharges.

EPA valued the reduced cancer cases using estimated willingness-to-pay values for avoiding premature mortality. The values used in this analyses are based on a range of values identified in the EPA Office of Policy Analysis' review of available studies. The mean value of avoiding one statistical death is estimated to be $5.8 million. This estimate does not include estimates of morbidity prior to death.

EPA also estimated aggregate cancer risk from consuming contaminated fish for recreational and subsistence anglers and their families. This analyses is based on thirteen carcinogenic pollutants found in MP&M effluent discharges. Estimated contaminants in fish tissue reflect predicted in-stream pollutant concentrations and biological uptake factors. EPA used data on numbers of licensed fishermen by State and county, presence of fish consumption advisories, fishing activity rates, and average household size to estimate the affected population of recreational and subsistence anglers and their families. The analyses uses different fish consumption rates for recreational and subsistence anglers to estimate the change in cancer risk among these populations.

The proposed rule eliminates an estimated 0.05 cancer cases per year for combined recreational and subsistence angler populations, representing a reduction of about 36 percent from a baseline of about 0.13 cases. This translates into $0.3 million (1999$) in annual benefits due to reduced cancer risk from consumption of contaminated fish by these populations.

Total benefits from reduced incidence of cancer cases, including both drinking water and fish exposures are $13.3 million (1999$) annually (see Table XX–2).

TABLE XX–2.—ESTIMATED ANNUAL BENEFITS FROM AVOIDED CANCER CASES FROM FISH AND DRINKING WATER CONSUMPTION

Regulatory status	Drinking Water		Fish Consumption		Total	
	Annual cancer cases	Benefit value (million 1999$)	Annual cancer cases	Benefit value (million 1999$)	Annual cancer cases	Benefit value (million 1999$)
Baseline						
Baseline	5.10	[1] N/A	0.126	N/A	5.23	N/A
Proposed Option						
Number of Cases/Value	2.86	$13.0	0.081	$0.3	2.94	$13.3
Percent Reduction	43.9%	N/A	35.7%	N/A	43.9%	N/A
Option 2/6/10						
Number of Cases/Value	2.73	$13.7	0.081	$0.3	2.81	$14.0
Percent Reduction	46.5%	N/A	35.7%	N/A	46.1%	N/A
Option 4/8						
Number of Cases/Value	2.73	$13.8	0.062	$0.4	2.79	$14.2
Percent Reduction	46.5%	N/A	49.2%	N/A	46.5%	N/A

Source: U.S. Environmental Protection Agency.

[1] Not Applicable.

2. Reductions in Systemic Health Effects

EPA expects that the proposed rule would also generate a wide range of non-cancer health benefits (*e.g.,* systemic effects, reproductive toxicity, and developmental toxicity) from reduced contamination of fish tissue and drinking water sources. The change in exposure to pollutants through fish and water consumption relative to pollutant-specific health effects thresholds yields an additional measure of the human health benefits that are likely to result from the proposed regulation. EPA compared estimated in-stream pollutant concentrations for 77 systemic toxicants with risk reference doses to calculate a hazard score. The systemic hazard score is the sum of the ratios of pollutant quantities ingested to the daily reference dose for each pollutant. Values above or near one indicate the potential for health non-cancer hazards. The hazard score assumes that the combined effect of ingesting multiple pollutants is proportional to the sum of their effects individually.

The distribution of hazard scores was calculated for drinking water and fish consumption populations for baseline and post-compliance exposures. The results show movement in populations from higher risk values to lower risk values for both the fish and drinking water analyses. Substantial increases in the percentage of the exposed populations that would be exposed to no risk of systemic health hazards occur in both analyses.

3. Benefits from Reduced Exposure to Lead

EPA performed a separate analyses of benefits from reduced exposure to lead. This analyses differs from the analyses of systemic health risk from exposure to other MP&M pollutants because it is based on dose-response functions tied to specific health endpoints to which monetary values can be applied.

Many lead-related adverse health effects are relatively common and are chronic in nature. These effects include but are not limited to hypertension, coronary heart disease, and impaired cognitive function. Lead is harmful to any exposed individual, and the effects of lead on children are of particular concern. Children's rapid rate of development makes them more susceptible to neurobehavioral deficits resulting from lead exposure. The neurobehavioral effects on children from lead exposure include hyperactivity, behavioral and attention difficulties, delayed mental development, and motor and perceptual skill deficits.

This analyses assessed benefits of reduced lead exposure from consumption of contaminated fish tissue to three sensitive populations: (1) Preschool age children, (2) pregnant women, and (3) adult men and women. This analyses uses blood-lead levels as a biomarker of lead exposure. EPA estimated baseline and post-compliance blood lead levels in the exposed populations and then used changes in these levels to estimate benefits in the form of avoided health damages.

EPA assessed neurobehavioral effects on children based on a dose-response relationship for IQ decrements. Avoided neurological and cognitive damages are expressed as changes in overall IQ levels, including reduced incidence of extremely low IQ scores (<70, or two standard deviations below the mean) and reduced incidence of blood-lead levels above 20 mg/dL. The analyses uses the value of compensatory education that an individual would otherwise need and the impact an additional IQ point on individuals' future earnings to value the avoided neurological and cognitive damages. EPA estimated that implementation of the proposed rule would result in avoided IQ loss of 489 points across all exposed children. The estimated monetary value of avoided IQ loss is $4.9 million (1999$). In addition, reduced occurrences of extremely low IQ scores (<70) and reduced incidence of blood-lead levels above 20 mg/dL would result in a decrease in the annual cost of compensatory education for children with learning disabilities of $0.1 million (1999$).

Prenatal exposure to lead is an important route of exposure. Fetal exposure to lead in utero due to maternal blood-lead levels may result in several adverse health effects, including

decreased gestational age, reduced birth weight, late fetal death, neurobehavioral deficits in infants, and increased infant mortality. To assess benefits to pregnant women, EPA estimated changes in the risk of infant mortality due to changes in maternal blood-lead levels during pregnancy. This analyses used the estimated willingness-to-pay (WTP) to avoid a mortality to estimate the monetary benefit associated with reducing risks of neonatal mortality. The estimated monetary value of benefits from reduced neonatal mortality is $9.33 million (1999$).

Lead exposure has been shown to have adverse effects on the health of adults as well as children. The health effects in adults that EPA was able to quantify all relate to lead's effects on blood pressure. Quantified health effects include increased incidence of hypertension (estimated for males only), initial coronary heart disease (CHD), strokes (initial cerebrovascular accidents and atherothrombotic brain infarctions), and premature mortality. This analyses does not include other health effects associated with elevated blood pressure, and other adult health effects of lead including nervous system disorders in adults, anemia, and possible cancer effects. EPA used cost of illness estimates (*i.e.,* medical costs and lost work time) to estimate monetary value of reduced incidence of hypertension, initial CHD, and strokes. EPA then used the value of a statistical life saved to estimate changes in risk of premature mortality. The estimated monetary value of health benefits to adults is $13.6 million (1999$) (see Table XX–3).

Total benefits from reduced exposure to lead, including both children and adults are $28.0 million (1999$) annually under the proposed option.

TABLE XX–3.—NATIONAL ADULT LEAD BENEFITS

[Millions of 1999$ per year]

Category	Proposed option		Option 2/6/10		Option 4/8	
	Reduced cases	Monetary value	Reduced cases	Monetary value	Reduced Cases	Monetary value
Men						
Hypertension	959.85	$1.00	991.41	$1.04	992.20	$1.04
CHD	1.24	$0.09	1.29	$0.09	1.29	$0.09
CBA	0.52	$0.14	0.53	$0.14	0.53	$0.14
BI	0.29	$0.08	0.30	$0.08	0.30	$0.08
Mortality	1.7	$9.85	1.76	$10.19	1.76	$10.20
Women						
CHD	0.39	$0.03	0.40	$0.03	0.40	$0.03
CBA	0.17	$0.03	0.18	$0.04	0.18	$0.04
BI	0.10	$0.02	0.11	$0.02	0.11	$0.02
Mortality	0.41	$2.38	0.42	$2.46	0.42	$2.46
Total Benefits	.....	$13.6	.....	$14.08	.....	$14.09

National Level Exposed Population:
(1) Hypertension: 428,363 men ages 20 to 74;
(2) Coronary heart disease, cerebrovascular accidents, brain infarction, and mortality: 173,386 men and 192,091 women ages 45–74.

4. Exceedences of Health-Based AWQC

EPA also estimated the effect of MP&M facility discharges by comparing pollutant concentrations in affected waterways to ambient water criteria for protection of human health. This analysis compares the estimated baseline and post-compliance in-stream pollutant concentrations with ambient water quality criteria (AWQC). The comparison included AWQC for protection of human health through consumption of organisms and for consumption of organisms and water. Pollutant concentrations in excess of these values indicate potential risks to human health. EPA modeling results show that baseline in-stream concentrations of 18 pollutants are estimated to exceed human health criteria for consumption of water and organisms in 10,310 receiving reaches nationwide. The proposed rule eliminates concentrations in excess of the criteria for consumption of water and organisms on 1,105 of these reaches. EPA also estimates that the proposed rule eliminates the occurrence of concentrations in excess of human health criteria for consumption of organisms only on 121 of the 192 reaches on which baseline discharges are estimated to cause concentrations in excess of AWQC values. Results also show that 382 receiving reaches will experience partial water quality improvements from reduced occurrence of some pollutant concentrations in excess of AWQC limits for consumption of water and organisms.

C. Ecological, Recreational and Nonuser Benefits

EPA expects the proposed regulation to provide ecological benefits by improving the habitats or ecosystems (aquatic and terrestrial) affected by the MP&M industry's effluent discharges. Benefits associated with changes in aquatic life include: restoration of sensitive species: Recovery of diseased species: changes in taste- and odor-producing algae; changes in dissolved oxygen (DO); increased assimilative capacity of affected waterways; and improved related recreational activities. These activities include swimming, fishing, boating and wildlife observation that may be enhanced when risks to aquatic life are reduced. Among these ecological benefits, EPA was able to estimate dollar values for improved recreational opportunities and for nonuser benefits.

EPA expects the MP&M rule to improve aquatic species habitats by reducing concentrations of toxic and conventional contaminants in water. These improvements should enhance the quality and value of water-based recreation, such as fishing, swimming,

wildlife viewing, camping, waterfowl hunting, and boating. The benefits from improved water-based recreation would be seen as increases in the increased value participants derive from a day of recreation or the increased number of days that consumers of water-based recreation choose to visit the cleaner waterways. This analysis measures the economic benefit to society from water quality improvements based on the increased monetary value of recreational opportunities resulting from those improvements.

EPA assessed recreational benefits of reduced occurrence of pollutant concentrations exceeding aquatic life and/or human health AWQC values. This analysis combined the findings from the aquatic life benefits analysis and the human health AWQC exceedence analysis described previously. These analyses found that 10,443 stream reaches exceed chronic or acute aquatic life AWQC and/or human health AWQC values at the baseline discharge levels (see Table XIII–4). The proposed rule is expected to eliminate exceedences on 1,185 of these discharge reaches, leaving 9,258 reaches with concentrations of one or more pollutants that exceed AWQC limits. Of these 9,258 reaches, 1,837 reaches will experience partial water quality improvements from reduced occurrence of some pollutant concentrations in excess of AWQC limits.

TABLE XX–4.—ESTIMATED MP&M DISCHARGE REACHES WITH MP&M POLLUTANT CONCENTRATIONS IN EXCESS OF AWQC LIMITS FOR PROTECTION OF HUMAN HEALTH OR AQUATIC SPECIES

Regulatory status	Number of reaches with MP&M pollutant concentrations exceeding AWQC limits	Number of benefitting reaches	
		All AWQC exceedences eliminated	Number of AWQC exceedences reduced
Baseline	10,443	.....	.....
Proposed option	9,258	1,185	1,837
Option 2/6/10	4,217	6,226	1,894
Option 4/8	4,226	6,217	1,866

EPA attached a monetary value to these reduced exceedences based on increased values for recreational fishing and for nonuser values. Since the benefiting reaches are close to densely populated areas potential recreational users may also benefit from reduced visit ''price'' to these sites (i.e., lower travel costs to good recreational sites). EPA applied a benefits transfer approach to estimate the total willingness to pay (WTP), including both use and non-use values, for improvements in surface water quality. This approach builds upon a review and analysis of the surface water valuation literature.

EPA first estimated the baseline value of water-based recreation for the benefitting reaches based on estimated annual person-days of recreational fishing. The baseline per-day values of water-based recreation are based on studies by Walsh et. al (1992) and Bergstrom and Cordell (1991). The studies provide values per recreation day for a wide range of water-based activities, including fishing, boating, wildlife viewing, waterfowl hunting, camping, and picnicking. The mean value per recreational fishing day used in this analyses is $39.62.

EPA then applied the percentage change in the recreational fishing value of water resources implied by surface water valuation studies to estimate changes in values for all MP&M reaches in which the regulation eliminates AWQC exceedences by one or more MP&M pollutants. The Agency selected eight of the most comparable studies and calculated the changes in recreational fishing values from water quality improvements (as percentage of the baseline) implied by those studies. Sources of estimates included Lyke (1993), Jakus et al. (1997), Montgomery and Needleman (1997), Paneuf et al. (1998), Desvousges et al. (1987), Lant and Roberts (1990), Farber and Griner (2000), and Tudor et al. (2000). EPA took a simple mean of point estimates from all applicable studies to derive a central tendency value for percentage change in the water resource values due to water quality improvements.

This approach uses all possible applicable valuation studies, makes unit values more likely to be nationally representative, and avoids the potential bias inherent in using a single study to make estimates at the national level. These studies yielded estimates of increased recreational fishing value from water quality improvements expected from reduced MP&M discharges of 10 to 15 percent. The estimated national recreational benefits of the proposed rule (1999$) are provided in Table XIII–5 below. Note that the benefits transfer approach used in this analyses is based on eight studies as opposed to one used in the previous rule.

The resulting average changes in participants' valuation of water resources *per year* resulting from the MP&M rule is modest ($18.12 per angler per year). EPA applied these estimates to the portion of the population residing in each county that is traversed by (*i.e.,* is adjacent to) a water body that benefits from the proposed MP&M rule. The portion of the anglers adjacent to the reach is calculated based on the number of fishing licenses sold in the relevant counties and the ratio of the benefiting reach length to the number of total reach miles in the county. The results were then extrapolated to the national level based on facility sample weights.

Removing water quality impairments would increase services provided by water resources to recreational users. Potential recreational users are expected to benefit from improved recreational opportunities, including an increased number of available choices of recreational sites. For example, some of the streams that were not usable for recreation under the baseline discharge conditions may be newly included in the site choice set for recreational users from nearby counties. Streams that have been used for recreation under the baseline conditions can become more attractive for users making recreational trips more enjoyable. Individuals may also take trips more frequently if they enjoy their recreational activities more.

EPA estimated that 20.2 million anglers will benefit from improved recreational opportunities because they live in counties that are traversed by reaches expected to benefit from the MP&M regulation. The results show that roughly half of the nation's recreational

anglers will benefit from the proposed rule. These results partially stem from the concentration of MP&M facilities in all heavily populated areas. However, EPA recognizes that extrapolating from sample facility to national results introduces uncertainty in the analyses, and is continuing to explore ways to reduce this uncertainty. The Agency is requesting comment on the methods used to extrapolate sample results to national benefit estimates. The extrapolation method used is described in detail in chapters 5 and 15 and appendix F of the EEBA.

EPA also estimated non-market nonuser benefits. These non-market nonuser benefits are not associated with current use of the affected ecosystem or habitat; instead, they arise from the value society places on improved water quality independent of planned uses or based on expected future use. Past studies have shown that nonuser values are a sizable component of the total economic value of water resources. EPA estimated average changes in nonuser value to equal one-half of the recreational fishing benefits. The estimated increase in nonuser value is $182.7 million (1999$).

TABLE XX–5.—ESTIMATED RECREATIONAL FISHING AND NON-USE BENEFITS FROM REDUCED MP&M DISCHARGES

[Million 1999$]

Benefit Type	Proposed option	Option 2/6/10	Option 4/8
Recreational Fishing	$365.4	$960.3	$962.1
Nonuse Benefit (1/2 of Recreational Fishing)	182.7	480.2	481.1
Total Recreational Benefits	548.1	1,440.5	1,443.2

Note: Categories may not sum to totals due to rounding of individual estimates for presentation purposes.

EPA calculated the total value of enhanced water-based recreation opportunities by summing recreational fishing and nonuser value. The resulting increase in value of water resources to recreational anglers and nonusers is $548.1 million, with an upper and lower bound range of $294 to $941 million (1999$) annually.

D. Productivity Changes: Cleaner Sewage Sludge (Biosolids)

EPA evaluated two productivity measures associated with MP&M pollutants. The first measure was the pollutant interference at publicly-owned treatment works (POTWs) which were quantified but not monetized in Section XII. The second measure is pass-through of pollutants into the sludge which limits options for disposing of their sewage sludge. EPA quantified the reduced costs for managing and disposing of sewage sludge. This analyses relied on data from 147 POTW surveys. The survey provided information on sewage sludge use and disposal costs and practices, total metal loadings to the POTW, percentage of total metal loadings contributed by MP&M facilities, and the number of known MP&M dischargers to the POTW The survey also provided information on the percentage of qualifying sludge that is not land applied and reasons for not land applying qualifying sludge.

EPA has promulgated regulations establishing standards for sewage sludge when it is applied to the land, disposed of at dedicated sites (surface disposal), and incinerated (40 CFR part 503). In addition, EPA has also established standards for sewage sludge when it is disposed of in municipal solid waste landfills (40 CFR part 258). Disposing of sewage sludge containing lower levels of pollutants is less expensive than disposing of more contaminated sewage because these regulations restrict disposal options based on sludge pollutant levels. The POTW survey indicated that the costs of alternative use/disposal practices follow a consistent ordinal relationship. That is, certain use/disposal practices (*e.g.,* incinerating sludge) are generally more expensive than other practices (*e.g.,* land application).

EPA estimated baseline and post-compliance sludge concentrations of eight metals for POTWs receiving discharges from the sample MP&M facilities. EPA compared these concentrations with the relevant metal concentration limits for land application and surface disposal. In the baseline case, EPA estimated that concentrations of one or more metals at 6,953 POTWs would fail the land application limits.

EPA estimates that 62 POTWs will be able to select the lower-cost land application disposal based on estimated reductions in sludge contamination. An estimated 1.7 million dry metric tons (DMT) of sewage sludge would newly qualify for land application annually. EPA also estimated that 21 POTWs that previously met only the land application pollutant limit would, as a result of regulation, meet the more stringent land application concentration limits. EPA expects these POTWs to benefit through reduced record-keeping requirements and exemption from certain sludge management practices. The annual estimated cost savings for the POTWs expected to upgrade their sludge disposal practices are $61.3 million (1999$).

This analyses includes an adjustment to the estimate of national sludge use/disposal cost benefits for POTWs located at cost-prohibitive distances from agricultural, forest, or disturbed lands suitable for sludge application. EPA assumed that 46 percent of sludge generated in the United States is generated by POTWs located too far from sites suitable for application sewage sludge to make these practices economical.

E. Total Estimated Benefits of the Proposed MP&M Rule

EPA estimates that total benefits for the five categories for which monetary estimates were possible are $0.651 billion (1999$) annually. EPA characterized uncertainty inherent in the benefits analyses by bounding benefit estimates. The low and upper bound benefit estimates of the proposed option are $0.347 and $1,144 billion (1999$) annually. EPA's complete benefit assessment can be found in Economic, Environmental, and Benefit Assessment of Proposed Effluent Limitations and Guidelines for the Metal Products and Machinery Industry. The monetized benefits of the rule underestimate the total benefits of the rule because it omits various sources of benefits to society may from reduced MP&M effluent discharges. Examples of benefit categories not reflected in this estimate include: non-cancer health benefits other than benefits from reduced exposure to lead, other water dependent recreational benefits such as swimming, boating, wildlife viewing, and waterskiing, and reduced cost of

drinking water treatment for the pollutants with drinking water criteria.

TABLE XX–6.—ESTIMATED BENEFITS FROM REDUCED MP&M DISCHARGES

[Annual Benefits—Million 1999$]

Benefit category	Proposed option	Option 2/6/10	Option 4/8
1. Reduced Cancer Risk:			
Fish Consumption	$0.3	$0.3	$0.4
Water Consumption	13.0	13.7	13.8
2. Reduced Risk from Exposure to Lead:			
Children	14.4	14.8	14.9
Adults	13.6	14.1	14.1
3. Avoided Sewage Sludge Disposal Costs	61.3	68.5	127.4
4. Enhanced Fishing	365.4	960.7	962.7
5. Nonuse benefits (½ of Recreational Use Benefits)	182.7	480.4	481.3
Total Monetized Benefits	650.6	1,553.5	1,614.4

As previously mentioned, the EEBA includes national estimates for benefits in two other categories, enhanced boating and wildlife viewing. In addition, it also includes estimates from a travel cost analyses of recreational benefits from enhanced fishing, swimming, boating and wildlife viewing performed for the state of Ohio. The case study analyses supplements the national level analyses performed for the proposed MP&M regulation by using improved data and methods to determine MP&M pollutant discharges from both MP&M facilities and other sources and by estimating swimming, fishing, boating, and near-water activities. The random utility model (RUM) used in the analyses estimates the effects of the specific water quality characteristics analyzed for the proposed MP&M regulation (i.e., the presence of AWQC exceedances and concentrations of the nonconventional nutrient Total Kjeldahl Nitrogen.) The direct link between the water quality characteristics analyzed for the rule and the characteristics valued in the RUM analyses reduces uncertainty in benefit estimates and makes the analyses of recreational benefits more robust. This analyses is presented in Chapters 20, 21, and 22 of the EEBA.

F. Benefit-Cost Comparison

EPA cannot perform a complete benefit-cost comparison because not all of the benefits resulting from the proposed regulatory alternative can be valued in dollar terms. A comparison of costs and benefits is thus limited by the lack of a comprehensive benefits valuation and also by some uncertainties in the estimates. Nonetheless, EPA presents the following summary comparison of costs and benefits for the proposed rule. The social cost of the proposed rule is $2.1 billion annually (1999$). The total benefits that can be valued in dollar terms in the categories traditionally analyzed for effluent guidelines range from $0.4 billion to $1.1 billion annually (1999$). EPA believes that the benefits of the proposed regulation justify the social costs.

XXI. Regulatory Implementation

A. Compliance Dates

As discussed in Section XII of this notice, EPA is proposing to establish a three-year deadline (from the date of publication of the final MP&M rule) for compliance with the MP&M pretreatment standards for existing sources (PSES). EPA is proposing a three-year deadline because design and construction of systems adequate for compliance with PSES will be a substantial undertaking for many MP&M sites. In addition, control authorities (*e.g.,* POTWs) will need the time to develop the permits or other control mechanisms for their industrial users.

Once EPA finalizes the MP&M rule, these limitations will be reflected in NPDES permits issued to direct dischargers.

New sources must comply with the new source standards and limitations (PSNS and NSPS) of the MP&M rule (once it is finalized) at the time they commence discharging MP&M process wastewater. Because the final rule is not expected within 120 days of the proposed rule, the Agency considers a discharger a new source if its construction commences following promulgation of the final rule (40 CFR 122.2; 40 CFR 403.3). In addition, today's notice fully replaces the MP&M Phase I proposal, published on May 30, 1995. Therefore, compliance deadlines in that proposal would obviously no longer apply.

B. Implementation of Limitations and Standards

1. Concentration-Based Limitations and Standards

As discussed in Section II.D, EPA is proposing concentration-based limits for all subcategories except the Steel Forming & Finishing Subcategory for which EPA is proposing production-based limits (see Section XXI.B.2, below, for a discussion on the Steel Forming & Finishing Subcategory). Unlike the Phase I proposal, EPA is not proposing to require permit writers or control authorities (*e.g.,* POTWs) to implement the limits on a mass basis for dischargers. Instead EPA is proposing to authorize permit writers and control authorities to use their best professional judgement to decide when it is most appropriate to implement mass-based limits. The NPDES regulations (40 CFR 122.45(f)) require permit writers to implement mass-based limitations for direct dischargers, but allows an exception when the limits are expressed in terms of other units of measurement (*e.g.,* concentration) and the General Pretreatment Standards (40 CFR 403.6(d)) provides that the control authority may impose mass limitations on industrial users which are using dilution to meet applicable pretreatment requirements or where mass limitations are appropriate. EPA believes that this approach will reduce implementation burden on POTWs associated with implementing mass-based limits at all of their MP&M industrial users, but will still result in increased use of water conservation practices at the facilities where POTWs determine it is most appropriate. EPA believes that MP&M facilities that have been using the best pollution prevention and water conservation practices may also request that the permit writer or POTW use

mass-based limits in their permits or control mechanism. The Agency is providing detailed information on water use levels for specific unit operations in Section 15 of the Technical Development Document for today's proposal. EPA believes this information will be useful to permit writers and control authorities in those instances where they deem it appropriate to set mass-based limits.

2. Mass-Based Limitations and Standards

a. Background

The effluent limitations guidelines and standards for BPT, BAT, NSPS, PSES, and PSNS proposed today for the Steel Forming and Finishing Subcategory are expressed as mass limitations in pounds/1,000 pounds of product. The mass limitation is derived by multiplying an effluent concentration (determined from the analyses of treatment system performance) by an appropriate wastewater volume (''production-normalized flow'') determined for each forming or finishing operation expressed in gallons/ton of product. EPA developed the production normalized flows used to develop the limits in the proposed rule from survey questionnaire responses from steel forming and finishing facilities. (The production-normalized flows are provided in the Technical Development Document.) However, EPA did not collect analytical wastewater samples from Steel Forming & Finishing facilities that used the Option 2 treatment technology (see Section VIII for a description of the technology options). EPA transferred the effluent concentrations used to develop the proposed Steel Forming & Finishing subcategory limitations and standards from those used for the General Metals subcategory. EPA believes that the wastewater characteristics of the General Metals subcategory closely resemble those of the Steel Forming & Finishing subcategory. The concentration-based limitations and standards for the General Metals subcategory are provided in Subpart A of the proposed codified regulation that accompanies this preamble. EPA will conduct analytical wastewater sampling of well-operated chemical precipitation and clarification systems at steel forming and finishing facilities post-proposal. EPA intends on developing limitations and standards for this subcategory for the final rule that would be based on the steel forming and finishing facilities in this subcategory.

A facility subject to today's proposed regulation can use a combination of various treatment alternatives and/or water conservation practices to achieve a particular effluent limitation or standard. The model treatment systems (*i.e.,* Option 2 for BPT, BAT, BCT, and PSES and Option 4 for NSPS and PSNS, as described in Section VIII) illustrate at least one means available to achieve the proposed effluent limitations guidelines and standards.

As discussed above in Section XXI.B.1, both the NPDES permit regulations and the General Pretreatment Regulations discuss the use of mass-based limitations and standards. In order to convert the proposed effluent limitations and standards expressed as pounds/1,000 pounds of product to a monthly average or daily maximum permit limit, the permitting or control authority would use a production rate with units of tons/day. The NPDES permit regulations (Part 122.45(b)(2)) require that NPDES permit limits be based on a ''* * * reasonable measure of actual production.'' A similar requirement is found in the General Pretreatment regulations (40 CFR 403.6(c)(3)). As discussed in Section VI, facilities in the proposed MP&M Steel Forming & Finishing subcategory, are currently covered under the Iron & Steel Manufacturing Point Source Category regulations (40 CFR part 420). The production rates used for NPDES permitting for the iron and steel industry under 40 CFR part 420 have commonly been the highest annual average production from the prior five year period prorated to a daily basis, or the highest monthly production over the prior five years prorated to a daily basis. Stakeholders involved in EPA's proposed revision of the Iron and Steel effluent limitations guidelines and standards (which is being proposed under a separate notice) have indicated that (1) EPA should include the method used to determine appropriate production rates for calculating allowable mass loadings into the regulation for consistency, so that the permit writers can all use the same basis; and (2) EPA should use a high production basis, such as maximum monthly production over the previous five year period or maximum design production, in order to ensure that a facility will not be out of compliance during periods of high production.

Both the NPDES and General Pretreatment regulations require that, for existing sources, production-based effluent limitations guidelines and standards be based not on production capacity, but on a ''reasonable measure of actual production.'' The current iron and steel regulation at 40 CFR 420.04 requires that the mass-based pretreatment requirements be based on a reasonable measure of actual production. That regulation provides two examples of what may constitute a reasonable measure of actual production: (1) the monthly average for the highest of the previous five years, or (2) the high month of the previous year. Both values are converted to a daily basis (*i.e.,* tons/day) for purposes of calculating monthly average and daily maximum mass-based permit effluent limitations.

Each of the above regulations requires that effluent limitations and pretreatment standards for new sources must be based on projected production. That approach is carried forward in this proposed regulation.

EPA believes that production rates used in some permits and control mechanisms have been derived in a manner that is not consistent with the term ''reasonable measure of actual production'' specified at 40 CFR 122.45(b)(2)(i), 403.6(c)(3), and 420.04. In some cases, maximum production rates for similar process units discharging to one treatment system were determined from different years or months, which may provide an unrealistically high measure of actual production. In EPA's view, this unrealistic estimate of production would occur if the different process units could not reasonably produce at these high rates simultaneously.

The ideal situation for the application of production-based effluent limitations and standards is where production is relatively constant from day-to-day or month-to-month. In this case, the production rate used for purposes of calculating the permit limitations would then be the average rate. However, in the case of the steel forming and finishing industry, production rates are not constant and vary significantly based on factors such as fluctuations in market demand for domestic products, maintenance, product changes, equipment failures, and facility modifications. As such, the typical production rate for individual facilities vary significantly over time, especially over the customary five-year life of a permit or control mechanism.

Although permits and control mechanisms can be modified, if necessary, during the five-year life of a permit or control mechanism, re-opening a permit can be very burdensome on the regulator and the facility. Therefore, the objective in determining a production estimate for a facility is to develop a reasonable measure of production which can reasonably be expected to prevail during

the next term of the permit or control mechanism. The production estimate is used in combination with the production-based limitations to establish a maximum mass of pollutant that may be discharged each day and month. However, if the permit or control mechanism production rate is based on the maximum month, then the permit could allow excessive discharges of pollutants during significant portions of the life of the permit/control mechanism. These excessive allowances may discourage facilities from ensuring optimal waste management, water conservation, and wastewater treatment practices during lower production periods. On the other hand, if the average production rate is based on an average derived from the highest year of production over the past five years, then facilities may have trouble ensuring that their waste management, water conservation, and wastewater treatment practices can accommodate shorter periods of higher production. This might require facilities to target a more stringent treatment level than that on which the limits and standards were based during these periods of high production. To accomplish this, facilities would likely have to develop more efficient treatment systems, greater hydraulic surge capacity, and better water conservation and waste management practices, or they may have to contract haul a portion of their wastewater to off-site disposal during these periods.

b. Alternatives for Establishing Permit Effluent Limitations and Standards

EPA is soliciting comment on several alternative approaches that may result in more stringent mass-based permits/control mechanisms for some facilities with better protection of the environment for the entire life of a permit/control mechanism and may result in higher costs. Each alternative requires that production from unit operations that do not generate or discharge process wastewater shall not be included in the calculation of operating rates.

Alternative A: This is the basis for today's proposed limits. It retains the essential requirements of the rule that EPA currently regulates Steel Forming and Finishing facilities under (40 CFR 420.04). However, today's proposal provides additional instructions for avoiding approaches that result in unrealistically high estimates of actual production by only considering production from all production units that could occur simultaneously (see § 438.58(b)). This may result in higher costs for those facilities with current permit or control mechanism conditions based on production levels that are higher than levels that could occur simultaneously at multiple process units.

In determining the production rate for the Steel Forming and Finishing subcategory, EPA is proposing to require permit writers and control authorities to use the following protocols:

(1) For similar, multiple production lines with process waters treated in the same wastewater treatment system, the reasonable measure of production shall be determined from the combined production of the similar production lines during the same time period.

(2) For process wastewater treatment systems where wastewater from two or more different production lines are commingled in the same wastewater treatment system, the reasonable measure of production shall be determined separately for each production line (or combination of similar production lines) during the same time period.

Alternative B: The Agency is considering including in the rule a requirement for the permit writer/control authority to establish multi-tiered limits and pretreatment standards. Permit writers and control authorities currently use their best professional judgment for establishing multi-tiered permits. The Agency has issued guidance for use in considering multi-tiered permits (see chapter 5 of the ''U.S. EPA NPDES Permit Writers'' Manual,'' (EPA–833–8–96–003, December 1996) and chapter 7 of the ''Industrial User Permitting Guidance Manual,'' (EPA 833/R–89–001, September 29, 1989)).

In situations where a single set of effluent limitations or standards are not appropriate for the permit's (or control mechanism's) entire period, a tiered permit/control mechanism may be established. One set of limits would apply for periods of average production along with other sets which take effect when there are significant changes in the average production rate. The guidance notes that a 10 to 15 percent deviation above or below the long-term average production rate is within the range of normal variability. Predictable changes in the long-term production higher than this range would warrant consideration of a tiered or multi-tiered permit/control mechanism. Based on EPA's limited data, the facilities in the Steel Forming and Finishing subcategory may have a variable production rate where the permit/control mechanism modification process is not fast enough to respond to the need for higher or lower equivalent limits.

Alternative C: To provide a basis for deriving a permit/control mechanism production rate that is consistent with the term *reasonable measure of actual production* and that can be applied consistently for facilities in the Steel Forming and Finishing subcategory, EPA is also considering including a definition of ''production'' specific to this subcategory in the rule. The modified definition for use in developing the permit/control mechanism production basis would be the average daily operating rate for the year with the highest annual production over the past five years, taking into account the annual hours of operation of the production unit and the typical operating schedule of the production unit, as illustrated by the following example:

Highest annual production from previous five years: 3,570,000 tons.
Operating hours: 8,400 hours.
Hourly operating rate: 425 tons/hour.
Average daily operating rate (24 hour day): 10,200 tons/day.

The above example is for a process unit that is operated typically 24 hours per day with short-term outages for maintenance on a weekly or monthly basis. For facilities in the Steel Forming and Finishing subcategory that are operated typically less than 24 hours per day, the average daily operating rate must be determined based on the typical operating schedule (*e.g.,* 8 hours per day for a facility operated one 8-hour turn (or shift) per day; 16 hours per day for a facility operated for two 8-hour turns per day). For example:

Highest annual production from previous five years: 980,000 tons.
Operating hours: 4,160 hours.
Hourly operating rate: 235.6 tons/hour.
Average daily operating rate (16 hour day): 3,769 tons/day.

In this example, EPA recognizes that the approach could cause problems for a facility that was operated 16 hours/day at the time the permit was issued and then wished to change to 24 hours/day based on unforseen changes in market conditions. To address this issue, the approach could be combined with the tiered permit approach discussed above.

For multiple similar process units discharging to the same wastewater treatment system with one compliance point (*e.g.,* two electroplating lines operated with one treatment system for process waters), the year with the highest annual production over the previous five years under Alternative C would be determined on the basis of the

sum of annual production for both electroplating lines. Then, based on this year's average daily operating rate, the daily production rates would be calculated as above independently for each electroplating line using total annual production and annual operating hours for each line. The daily production values would be summed to calculate the average daily operating rate for the combination of the two lines. For example, consider the following production data:

Year	Electroplating line A (tons)	Electroplating line B (tons)	Total (tons)
1995	*1,859,000*	1,305,000	3,155,000
1996	1,675,000	*1,425,000*	3,100,000
1997	1,760,000	1,406,000	3,166,000
1998	1,580,000	1,328,000	2,908,000
1999	1,825,000	1,380,000	*3,205,000*

Annual maximum production rates for each electroplating line and the combination of the two lines are *italicized.* In this example, 1999 was the maximum production year for the combination of the electroplating lines and the data from each line that year would be used to calculate the average daily operating rates. Had the 1995 data from Electroplating Line A and the 1996 data from Electroplating Line B been used in combination (3,275,000 tons), an unrealistic measure of actual production might have resulted if the two electroplating lines could not produce at these high levels concurrently.

In contrast to the previous example, for multiple process units that are not similar, but have process wastewater commingled prior to treatment in one central wastewater treatment system with one compliance point, the year with the highest production over the previous five years would be determined separately for each production unit (or combination of similar and different production units) with the highest annual production. For example, consider a situation where process wastewater for an electroplating line, a pressure deformation operation, and an acid pickling operation are discharged through one compliance point. Consider the following example:

Year	Electroplating (tons)	Pressure deformation (tons)	Acid pickling (tons)
1995	575,000	650,000	900,000
1996	650,000	700,000	1,000,000
1997	675,000	*850,000*	950,000
1998	*750,000*	825,000	*1,125,000*
1999	700,000	600,000	900,000

In this example, 1998 production data for the electroplating line, 1997 data from the pressure deformation operation, and 1998 data for the acid pickling operation would be used to develop the effluent limitations or pretreatment standards used in the permit/control mechanism.

Alternative D: The Agency is considering establishing production-based maximum monthly average effluent limitations and standards in combination with daily-maximum concentration-based effluent limitations and standards. Under this alternative, the maximum monthly average NPDES permit and pretreatment control mechanism mass basis requirements would be determined using the part 438 subpart E production-based standards in combination with a reasonable measure of actual production, such as Alternative C above. However, the daily-maximum requirements would be in the form of effluent concentrations that would be included in part 438 subpart E in lieu of the daily-maximum production-based mass effluent limitations guidelines and standards. These daily maximum concentrations set out as effluent limitations guidelines and standards would be based on the long-term averages and variability factors derived from EPA sampling conducted post-proposal at steel forming and finishing facilities representative of BAT.

The Agency believes this approach would effectively address the potential issue cited above regarding short-term peaks in production under most circumstances. There would be no additional burden on the industry and permitting or control authorities for applying for and writing NPDES permits or pretreatment control mechanisms. Permitting and control authorities may need to revise their automated compliance tracking systems to account for both mass and concentration limitations at the same outfall, which is a common feature in many NPDES permits and pretreatment control mechanisms issued prior to this proposal.

EPA solicits comments on these alternatives to the proposed production bases for calculating effluent limitations and pretreatment standards used in NPDES permits or control mechanisms. In particular, the Agency solicits comments on related costs and any technical difficulties that steel forming and finishing facilities might have in meeting limits during short periods of high production. EPA also solicits other options for consideration.

C. Monitoring Flexibility

1. Monitoring Waiver

EPA's Small Business Advocacy Review (SBAR) Panel encouraged EPA to ''explore options for allowing certification in lieu of monitoring where an operator can determine, based on knowledge of the facility and its processes, that certain pollutants are not likely to be present or are adequately controlled.'' (See Section XXII.C for a discussion on the recommendations of the SBAR Panel). Other stakeholders expressed similar requests during public meetings with the Agency. Therefore, in an effort to reduce monitoring burden on facilities, EPA is proposing to allow MP&M indirect discharge facilities to

apply for a waiver that would allow them to reduce their monitoring burden (EPA discusses existing monitoring waivers available for direct dischargers later in this section). In order for a facility to receive a monitoring waiver, the facility would need to certify in writing to the control authority (*e.g.,* POTW) that the facility does not use, nor generate in any way, a pollutant (or pollutants) at its site and that the pollutant (or pollutants) is present only at background levels from intake water and without any increase in the pollutant due to activities of the discharger. The facility would need to base this certification on sampling data or other technical factors. The certification would not be a waiver from the pollutant numerical limit in the control mechanism (i.e., permit). It would only be a waiver from the monitoring requirements. In addition, EPA would still require the industrial user to monitor for the specified pollutants as part of the Baseline Monitoring Report (§ 403.12(b)) and the 90-day Compliance Report (§ 403.12(d)). EPA believes control authorities can use the sampling data generated from the Baseline Monitoring Report and the 90-day Compliance Report in conjunction with technical information on the raw materials and chemical processes used at the facility to determine whether there is sufficient reason to allow the monitoring waiver for any of the MP&M limited pollutants. Although EPA expects this monitoring waiver to reduce burden overall, the Agency estimates the burden associated with preparing the certification statement and related documentation as required by the Paper Reduction Act (see Section XXII.A for burden estimates).

EPA is proposing that the certification statement be submitted at the same time indirect discharging MP&M facilities submit ''periodic reports on continued compliance'' as directed by the General Pretreatment Standards (40 CFR 403.12(e)). Indirect dischargers submit such reports twice per year (typically June and December). In addition, the certification would need to be signed by the same individual that is authorized to sign the periodic reports as described in the General Pretreatment Standards 403.12(l). This monitoring waiver would be similar to the waiver in the Proposed ''Streamlining the General Pretreatment Regulations for Existing and New Sources of Pollution,'' 64 FR 39564; July 22, 1999 (commonly referred to as ''Pretreatment Streamlining''). If EPA promulgates the final Pretreatment Streamlining regulations prior to the final MP&M effluent guidelines and those regulations contain a similar provision then a waiver specific to MP&M facilities would be unnecessary.

EPA recently promulgated a regulation to streamline the NPDES regulations (''Amendments to Streamline the National Pollutant Discharge Elimination System Program Regulations: Round Two'' (65 FR 30886; May 15, 2000)). These revisions include a similar monitoring waiver for direct dischargers subject to effluent guidelines. Direct discharge facilities may forego sampling of a guideline-limited pollutant if that discharger ''has demonstrated through sampling and other technical factors that the pollutant is not present in the discharge or is present only at background levels from intake water and without any increase in the pollutant due to activities of the discharger.'' (65 FR 30908. 40 CFR 122.44). EPA noted, in the preamble to the final NPDES Streamlining rule, that it is providing a waiver from monitoring requirements, but not a waiver from the limit. In addition, the revision does not waive monitoring for any pollutants for which there are limits based on water quality standards. The waiver for direct dischargers lasts for the term of the NPDES permit and is not available during the term of the first permit issued to a discharger. Any request for this waiver under these revisions to the NPDES regulations must be submitted when applying for a reissued permit or modification of a reissued permit. Therefore, EPA is not proposing a monitoring waiver in the MP&M regulations for direct dischargers. When authorized by their permit writer, direct discharge facilities covered by any effluent guidelines (including MP&M) will be able to use the monitoring waiver contained in the NPDES streamlining final rule.

2. Monitoring Flexibility for Organic Pollutants

In an effort to reduce burden on MP&M facilities, EPA proposes three alternatives to allow for maximum flexibility while ensuring reductions in the amount of organic pollutants discharged from MP&M facilities. EPA is proposing to require MP&M facilities within the scope of this rule to either: (1) Meet a numerical limit for the total sum of a list of specific organic pollutants (similar to the Total Toxic Organics or TTO parameter used in the Metal Finishing Effluent Guidelines); (2) meet a numerical limit for TOC as an indicator parameter; or (3) develop and certify the implementation of an organic pollutant management plan.

As discussed in section II.D, EPA proposed using an organic pollutant indicator parameter in the 1995 Phase I MP&M proposal. At that time, however, the Agency did not provide the alternative of monitoring for individual organic pollutants. In an effort to provide such an alternative, EPA reviewed the sampling data to identify individual organic pollutants for which the Agency could develop individual limits. Due to the variety of organic pollutants used across MP&M facilities, EPA determined that it would be burdensome to facilities and permit writers to have to determine which limits to apply to a facility. Instead, EPA is proposing an approach similar to the one used in the Metal Finishing Effluent Guidelines (40 CFR part 433). EPA developed a list of organic pollutants, called the Total Organics Parameter (TOP), using the list of organic priority pollutants and other nonconventional organic pollutants that met EPA's ''pollutant of concern'' criteria for this rule (see Section VII for a discussion on the selection of the MP&M pollutants of concern). Of the non-conventional organic chemicals on the MP&M pollutant of concern list, EPA included only those that were removed in appreciable quantities by the selected technology option (based on toxic weighted pound-equivalents) in two or more subcategories. See appendix B to part 438 of the proposed rule accompanying this notice for a list of organic pollutants that comprise the proposed Total Organics Parameter (TOP). EPA has derived the numerical limit for TOP based on the contribution of each of the organic pollutants on the list in Appendix B using the data collected during sampling and determined its limitation using the same statistical methodology used for other limits developed for this proposal (see Section VIII.B). In any case where the data for these pollutants indicated a level below the minimum level (*i.e.,* below quantitation), EPA used the minimum level for the specific pollutant in the summation of the total organics parameter limit. Facilities will only have to monitor for those TOP chemicals that are reasonably present (see XXI.C.1 for a discussion on monitoring waivers). Note that the TOP limit shall not be adjusted for those pollutants that are not reasonably present. EPA solicits comment on this methodology. For compliance purposes, pollutants that have been given a waiver (because they are not reasonably present) will be counted as zero in the TOP limit. For remaining pollutants, the reported value, when above the detection limit, shall be used in the TOP calculation. When a pollutant is

reported as a ''non-detect'' (*i.e.,* not found above the nominal quatitation value listed in appendix B of the proposed rule), the nominal quantitation value shall be used in the TOP calculation.

EPA considered using the same list of organic chemicals as in the Metal Finishing effluent guidelines Total Toxic Organics (TTO) list (40 CFR 433.11(e)), but rejected this approach. EPA did not include all parameters from the Metal Finishing TTO list because: (1) EPA did not find many of the TTO parameters in the wastewater sampled for the MP&M rule; (2) many of the listed organics are pesticides that are no longer manufactured (*e.g.,* DDT) and would not be used in MP&M operations; and (3) most facilities subject to the Metal Finishing TTO limits switched to the use of solvents (or aqueous cleaners) that do not contain the organic chemicals on the Metal Finishing TTO list.

As discussed above, EPA is also proposing to allow the use of an indicator parameter to measure the presence of organic pollutants in MP&M process wastewater. Facilities can monitor for the organic pollutants specified in the total organics parameter list (as discussed above) to demonstrate compliance with the TOP limit or they can monitor for Total Organic Carbon (TOC) and meet the TOC limit. EPA chose TOC as an indicator parameter because of its ability to measure all types of organic pollutants. EPA solicits comment on the use of TOC as an indicator pollutant for the organic pollutants typically found in wastewater discharges from MP&M facilities. EPA also requests comment on whether the Agency should allow facilities to choose an indicator pollutant from a given set of choices (*e.g.,* COD, Oil & Grease (as HEM), TOC, Total Petroleum Hydrocarbons (as SGT–HEM)). EPA found TOC to be the best general indicator parameter for measuring the sum of organic compounds in a wastestream. EPA notes, however, that to determine the best indicator parameter for a particular wastestream, a facility would need to consider the specific organic components found in its wastestreams.

Finally, EPA is proposing a third alternative to reduce monitoring burden—the use of an organic pollutant management plan. The organic pollutant management plan would need to specify, to the satisfaction of the permitting authority or control authority, the toxic and non-conventional organic constituents used at the facility; the disposal method used; the procedures in place for ensuring that organic pollutants do not routinely spill or leak into the wastewater or that minimize the amount of organic pollutants used in the process; the procedures in place to manage the oxidation reduction potential (ORP) during cyanide destruction to control the formation of chlorinated organic byproducts; and the procedures to prevent the over dosage of dithiocarbamates when treating chelated wastewater. Facilities choosing to develop an organic pollutant management plan would need to certify that the procedures described in the plan are being implemented at the facility. Based on the current data base, EPA is concerned that wastewater generated by facilities in the Oily Wastes subcategory may require end-of-pipe treatment to reduce the concentrations of organic pollutants and that an organic management plan alone may not adequately control organic-bearing wastewater at facilities containing significant quantities of oil-bearing wastewater. Although EPA is proposing the use of the organics management plan be offered to Oily Wastes facilities, EPA solicits comment on whether sites with significant amounts of oil-bearing wastewater (for example, a facility in the Oily Waste subcategory) should be eligible for the use of an organic pollutant management plan in lieu of monitoring for TOP (Total Organics Parameter) or TOC (as an indicator).

3. Monitoring for Cyanide

For the General Metals, Metal Finishing Job Shop, Printed Wiring Board, and Steel Forming and Finishing subcategories, EPA is proposing to set a total cyanide limit. The point of compliance would be based on monitoring for total cyanide directly after cyanide treatment, before combining the cyanide treated effluent with other wastestreams. EPA is also proposing an alternative where a facility may take samples of final effluent, in order to meet the total cyanide limit, if the control authority adjusts the permit limits based on the dilution ratio of the cyanide wastestream flow to the effluent flow.

In addition, EPA has selected alkaline chlorination using sodium hypochlorite as the best available economically achievable technology for treating cyanide bearing wastewater from MP&M facilities. Not all cyanide however is amenable to alkaline chlorination due to ''unavoidable'' complexing with other compounds at the process source of the cyanide-bearing wastestreams. EPA believes that for some facilities it may be more accurate to monitor for the portion of cyanide in their wastewater that is amenable to alkaline chlorination than to measure total cyanide which may include cyanide complexes that this technology is not likely to treat. Therefore, EPA is also proposing an alternative ''amenable cyanide'' limit for each of these subcategories which a facility may use directly after cyanide treatment (*e.g.,* before combining the cyanide treated effluent with other wastestreams). The Agency proposes to allow the use of this limit upon the agreement of the facility and its permit writer or control authority (*e.g.,* POTW). However, when segregated cyanide treatment is in place as a preliminary step prior to commingling wastewater for chemical precipitation, EPA would allow the amenable cyanide alternative limit to be measured at the end-of-pipe (*i.e.,* final effluent) if the control authority adjusts the permit limits based on the dilution ratio of the cyanide wastestream flow to the effluent flow. If facilities are not using cyanide destruction treatment on cyanide-bearing wastestreams prior to commingling with metal-bearing streams, additional complexing can occur. This additional complexing would render the cyanide ''non-amenable'' when it would otherwise be amenable to alkaline chlorination. EPA considers such complexing to be ''avoidable'' and would not allow the use of end-of-pipe monitoring for amenable cyanide when in-process cyanide destruction is not performed. (See the final Organic Chemicals, Plastics and Synthetic Fibers Category Effluent Limitations Guidelines for a discussion on non-amenable versus amenable cyanide; 57 FR 41836; September 11, 1992).

D. Pollution Prevention Alternative for the Metal Finishing Job Shops Subcategory

EPA is soliciting comment on a compliance alternative that the Agency is considering for the Metal Finishing Job Shops subcategory of this proposed regulation (See Section VI.C.3. of this preamble for a description of this subcategory). The purpose of a pollution prevention compliance alternative (''P2 Alternative'') is to reduce economic impacts on the facilities in the Metal Finishing Job Shops subcategory and to take into consideration the activities and achievements of this Common Sense Initiative (''CSI'') sector to test innovative approaches to environmental protection, which has culminated in the National Metal Finishing Strategic Goals Program.

The National Metal Finishing Strategic Goals Program (''SGP'') was

developed out of EPA's sector based Common Sense Initiative. In 1994, EPA launched the CSI to promote ''cleaner, cheaper, and smarter'' environmental performance, using a non-adversarial, stakeholder consensus process to test innovative ideas and approaches. The SGP is a cooperative effort that involves all stakeholders (e.g., industry, regulators, environmental/citizen groups) to define a fundamentally different approach to environmental and public health protection by exploring a more flexible, cost-effective and environmentally protective solutions tailored to specific industry needs. The Metal Finishing SGP is a performance-based, voluntary program which includes commitments by the industry to meet multimedia environmental targets substantially reducing pollution from their operations beyond what is required by law. These goals will conserve water, energy and metals, and reduce hazardous emissions. The other stakeholders in this process (EPA, State and local regulators, and environmental/community groups) have also committed to working with the industry participants to help them meet their goals through compliance, technical, and financial assistance, removing regulatory and policy barriers, offering incentives, and an open dialogue as issues arise. (See *http://www.strategicgoals.org* for more information about the SGP and the Common Sense Initiative).

The SGP represents a long-term strategic vision for improved environmental protection by the entire metal finishing industry. The metal finishing industry's tangible commitment to work with the Agency lays the foundation for this pollution prevention (P2) compliance alternative.

The Agency is considering allowing indirect discharge facilities in the Metal Finishing Job Shops subcategory, with approval by their control authority (*e.g.,* POTW), to demonstrate compliance with specified pollution prevention and water conservation practices (in addition to maintaining compliance with the existing Metal Finishing and Electroplating Effluent Guidelines or approved local water quality-based limits, whichever is more stringent) in lieu of meeting the requirements of the MP&M regulation. Facilities in the Metal Finishing Job Shops subcategory that do not wish to use the compliance alternative would need to meet the full requirements of the MP&M regulation as specified in today's proposed rule.

EPA solicits comment on whether to allow all facilities in the Metal Finishing Job Shops subcategory to comply with the P2 Alternative or whether the P2 Alternative should only be available to facilities below a specified wastewater discharge volume. EPA has proposed low flow exclusions for indirect dischargers in the General Metals (1 MGY) and Oily Wastes (2 MGY) subcategories due to potential permitting burden on POTWs (see Sections II.D, VI.C and XII for a discussion on low flow exclusions).

One way that EPA is considering to specify pollution prevention and water conservation practices, without stifling innovation and advances, is to require facilities to choose practices from a larger list (or menu) of categories of specified practices (see below). EPA is considering requiring practices in all ten categories. The following is an example of the format and potential pollution prevention practices that EPA is considering for incorporation into the final MP&M rule:

Category 1. Must Use Practices That Reduce and/or Recover Drag-Out

To satisfy this requirement, facilities must implement three or more drag-out reduction practices or use at least one drag-out recovery (*i.e.,* chemical recovery) technology listed below on all electroplating or surface finishing lines.

Drag-out Reduction Practices

- Lower process solution viscosity and/or surface tension by lowering chemical concentration, increasing bath temperature, or use wetting agents.
- Reduce drag-out volume by modifying rack/barrel design and perform rack maintenance to avoid solution trapping under insulation.
- Position parts on racks in a manner that avoids trapping solution.
- Reduce speed of rack/barrel withdraw from process solution and/or increase dwell time over process tank.
- Rotate barrels over process tank to improve drainage.
- Use spray/fog rinsing over the process tank (limited applicability).
- Use drip boards and return process solution to the process tank.
- Use drag-out tanks, where applicable, and return solution to the process tank.
- Work with customers to ensure that part design maximizes drainage

Drag-out Recovery

Use a chemical recovery technology to recover drag-out from wastewater.

- Evaporators
- Ion exchange
- Electrowinning
- Electrodialysis
- Reverse osmosis

Category 2. Must Use Good Rinse System Design for Water Conservation

To satisfy this requirement, facilities must implement three or more elements of good rinse system design listed below on all electroplating or surface finishing lines:

- Select the minimum size rinse tank in which the parts can be rinsed and use the same size for the entire plating line, where practical.
- Locate the water inlet and discharge points of the tank at opposite positions in the tank to avoid short-circuiting or use a flow distributor to feed the rinse water evenly.
- Use air agitation, mechanical mixing or other means of turbulence.
- Use spray/fog rinsing (less effective with hidden surfaces).
- Use multiple rinse tanks in a counter-flow configuration (*i.e.,* counter-current cascade rinsing).
- Reuse rinse water multiple times in different rinse tanks for succeeding less critical rinsing

Category 3. Must Use Water Flow Control for Water Conservation

To satisfy this requirement, facilities must implement at least one effective method of water use control on all electroplating or surface finishing lines. Effective water use controls include, but are not limited to:

- Flow restrictors (Flow restrictors as a stand alone method of rinse water control are only effective with plating lines that have constant production rates, such as automatic plating machines. For other operations, there must also be a mechanism or procedure for stopping water flow during idle periods.)
- Conductivity controls
- Timer rinse controls
- Production activated control (*e.g.,* spray systems activated when a rack or barrel enters/exits a rinse station)

Category 4. Must Segregate Non-Process Water From Process Water

To satisfy this requirement, facilities must not combine non-process water such as non-contact cooling water with process wastewater prior to wastewater treatment.

Category 5. Must Use Water Conservation Practices With Air Pollution Control Devices

To satisfy this requirement, facilities operating air pollution control devices with wet scrubbers must recirculate the scrubber water as appropriate (periodic blowdown is allowed, as needed). Where feasible, reuse scrubber water in process baths.

Category 6. Must Practice Good Housekeeping

To satisfy this requirement, facilities must demonstrate compliance with each of the requirements listed below:

- Perform preventative maintenance on all valves and fittings (*i.e.,* check for leaks and damage) and repair leaky valves and fittings in a timely manner.
- Inspect tanks and liners and repair or replace equipment as necessary to prevent ruptures and leaks. Use tank and liner materials that are appropriate for associated process solutions.
- Perform quick cleanup of leaks and spills in chemical storage and process areas.
- Remove metal buildup from racks and fixtures.

Category 7. Minimize the Entry of Oil Into Rinse Systems

To satisfy this requirement, facilities must do at least one of the practices listed below:

- Minimize the entry of oil into cleaning baths or use oil skimmers or other oil removal devices in cleaning baths when needed to prevent oil from entering rinse tanks.
- Work with customers to degrease parts prior to shipment to the plating facility to minimize the amount of oils on incoming materials.

Category 8. Must Sweep or Vacuum Dry Production Areas Prior to Rinsing With Water

To satisfy this requirement, facilities must sweep or vacuum dry production area floors prior to rinsing with water.

Category 9. Must Reuse Drum/Shipping Container Rinsate Directly in Process Tanks

To satisfy this requirement, when performing rinsing of raw material drums, storage drums, and/or shipping containers that contain pollutants regulated under the MP&M regulation, facilities must reuse the rinsate directly into process tanks or save for use in future production.

Category 10. Must Implement Environmental Management and Record Keeping System

To satisfy this requirement, facilities must meet the requirements listed below:

- Implement an environmental management program that includes, but is not limited to, the following elements:
- Pollution prevention policy statement,
- Environmental performance goals,
- Pollution prevention assessment,
- Pollution prevention plan,
- Environmental tracking and record keeping system,
- Procedures to optimize control parameter settings (*e.g.,* ORP set point in cyanide destruction systems, optimum pH for chemical precipitation systems, etc.), and
- Statement delineating minimum training levels for wastewater treatment operators.

(EPA notes that it has developed a template for a metal finishing facility-specific Environmental Management System that is being used in conjunction with the SGP in EPA's Region 9 in California—see http://www.strategicgoals.org/tools/home.htm for information on this template).

The first two categories listed above involve practices and techniques for reducing drag-out. Drag-out is the film of chemical solution covering parts and fixtures as they exit process solutions. For many metal finishing operations, drag-out and the subsequent contamination of rinse waters is the major pollution control challenge. Reducing the formation of drag-out, minimizing the introduction of drag-out to rinse systems, and recovering drag-out are important pollution prevention measures. EPA believes that drag-out reduction and recovery may prevent a substantial pollutant loading of metals from being discharged to the POTW. However, EPA did not have sufficient information on the pollutant reductions, capital costs, and operating and maintenance costs associated with installation and operation of drag-out reduction and recovery technologies to include such equipment explicitly into the model that EPA uses to develop national estimates of compliance costs and pollutant reductions. Some aspects of drag-out reduction are captured in the flow rinse reduction modules of the cost and loadings model (see the Technical Development Document for a detailed discussion of the cost and loadings model). Good rinse design can reduce contamination of rinse water as well as reduce the volume of fresh water needed to perform the necessary rinsing. It also reduces the volume of wastewater requiring treatment, which in turn reduces costs and the volume of wastewater treatment sludge requiring disposal. EPA specifically solicits data on the pollutant reductions, capital costs, and operating and maintenance costs associated with installation and operation of drag-out reduction and recovery technologies.

EPA is considering allowing facilities complying with the P2 Alternative to substitute another pollution prevention practice for one listed above provided that the facility provides adequate justification for the modification in a written request submitted to the control authority. Facility owners must certify compliance with the pollution prevention requirements twice per year and maintain records at the facility indicating how each category requirement has been satisfied. Facilities choosing the P2 Alternative would also need to agree to make the practices enforceable. Reporting would occur in conjunction with their twice annual periodic reports on continued compliance under the General Pretreatment Regulations (40 CFR 403.12(e)).

EPA solicits comment on all aspects of the Pollution Prevention Alternative for the Metal Finishing Job Shops subcategory including the list of practices as well as the possible format for the alternative. More specifically, EPA requests comment on whether there are additional practices that should be listed, the costs of implementing this compliance alternative, the pollutant reduction associated with this alternative, and whether EPA should offer this alternative to other subcategories (even those not currently regulated by the Metal Finishing and Electroplating effluent guidelines). EPA also requests comments from local regulators on the implementation burden, the required documentation, and on the ability to enforce a P2 Alternative.

E. Upset and Bypass Provisions

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

F. Variances and Modifications

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

1. Fundamentally Different Factors Variances

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

Early on, EPA, by regulation provided for the FDF modifications from the BPT effluent limitations, BAT limitations for toxic and nonconventional pollutants and BPT limitations for conventional pollutants for direct dischargers. For indirect dischargers, EPA provided for modifications from pretreatment standards. FDF variances for toxic pollutants were challenged judicially and ultimately sustained by the Supreme Court. (*Chemical Manufacturers Assn* v. *NRDC,* 479 U.S. 116 (1985)).

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

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

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

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

2. Economic Variances

Section 301(c) of the CWA authorizes a variance from the otherwise applicable BAT effluent guidelines for nonconventional pollutants due to economic factors. The request for a variance from effluent limitations developed from BAT guidelines must normally be filed by the discharger during the public notice period for the draft permit. Other filing time periods may apply, as specified in 40 CFR 122.21(1)(2). Specific guidance for this type of variance is available from EPA's Office of Wastewater Management.

3. Water Quality Variances

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

4. Permit Modifications

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

G. Relationship of Effluent Limitations and Pretreatment Standards to NPDES Permits and Local Limits

Effluent limitations and pretreatment standards act as a primary mechanism to control the discharges of pollutants to waters of the United States. These limitations and standards are applied to individual facilities through NPDES permits and local limits developed for POTWs issued by EPA or authorized States under section 402 of the Act and local pretreatment programs under section 307 of the Act.

The Agency has developed the limitations and standards for this proposed rule to cover the discharge of pollutants for this industrial category. In specific cases, the NPDES permitting authority or control authority (*e.g.,* local POTW) may elect to establish technology-based permit limits or local limits for pollutants not covered by this regulation. In addition, if State water quality standards or other provisions of State or Federal law require limits on pollutants not covered by this regulation (or require more stringent limits or standards on covered pollutants to achieve compliance), the permitting or control authority must apply those limitations or standards.

H. Best Management Practices

Sections 304(e) and 402(a) of the Act authorize the Administrator to prescribe ''best management practices'' (BMPs). (See 40 CFR 122.44(k)). EPA may develop BMPs that apply to all industrial sites or to a designated industrial category and may offer guidance to permit authorities in establishing management practices required by unique circumstances at a given plant. Dikes, curbs, and other control measures are being used at some MP&M sites to contain leaks and spills as part of good ''housekeeping'' practices. However, on a facility-by-facility basis a permit writer may choose to incorporate BMPs into the permit. See section 8 of the Technical Development Document for this proposed rule for a detailed discussion of pollution prevention and best management practices used in the MP&M industry.

XXII. Related Acts of Congress, Executive Orders, and Agency Initiatives

A. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* An Information Collection Request (ICR) document has been prepared by EPA (ICR No. 1980.01) and a copy may be obtained from Sandy Farmer by mail at Collection Strategies Division; U.S. Environmental Protection Agency (2822); 1200 Pennsylvania Ave., NW., Washington, DC 20460, by email at farmer.sandy@epa.gov, or by calling (202) 260–2740. A copy may also be downloaded off the internet at *http://www.epa.gov/icr.*

There are five areas for which EPA is proposing, or considering to collect information from, or requiring reporting or record keeping by MP&M facilities. In all cases, EPA believes the collection of information, reporting, or record keeping is an alternative (*i.e.,* voluntary) that will allow a reduction in overall burden to facilities since EPA intends for these activities to reduce or eliminate effluent sampling and analysis costs. EPA solicits comment on all estimates discussed below.

First, EPA is proposing to allow indirect discharging MP&M facilities (upon agreement with the control authority) to reduce their analytical monitoring burden for specified pollutants by filing a statement that certifies that those pollutants are not present in the discharge or are present only at background levels from intake water and without any increase in the pollutants due to activities of the discharger (See § 438.4(e) and Section XXI.C.1 for a discussion of the monitoring waiver). EPA estimates the burden for reviewing analytical sampling data and other technical information required to make the certification (*e.g.,* raw material inventory logs, production information, product chemistry, and reports on source water) and for preparing the certification statement one time per permit cycle (*i.e.,* every 5 years) to be 24 hours. In developing the technical basis for the waiver, EPA is allowing the use of historical sampling data as well as sampling data generated for compliance reports required by the General Pretreatment Standards (40 CFR 403.12). Therefore, EPA does not anticipate additional monitoring burden associated with this waiver, particularly in comparison to the periodic compliance monitoring that is being replaced by this waiver. In addition, certification to receive a monitoring waiver under this proposed rule is voluntary. MP&M facilities may choose not to avail themselves of this optional reduction in monitoring. EPA estimates that 5,250 facilities will choose the monitoring waiver for some pollutants.

Second, EPA is proposing to allow facilities to implement an organic pollutant management plan as one alternative to meeting organic pollutant limits (or organic indicator limits). (See 438.4(b)). The organic pollutant management plan must specify, to the satisfaction of the permitting authority or control authority, the toxic and non-conventional organic constituents used at the facility; the disposal method used; the procedures in place for ensuring that organic pollutants do not routinely spill or leak into the wastewater or that minimize the amount of organic constituents used in the process; the procedures in place to manage the oxidation reduction potential (ORP) during cyanide destruction to control the formation of chlorinated organic byproducts; and the procedures to prevent the over dosage of dithiocarbamates when treating chelated wastewater. Facilities choosing to develop an organic pollutant management plan must certify that the procedures described in the plan are being implemented at the facility. EPA estimates the burden associated with preparing an organic pollutant management plan and an accompanying certification statement to be 50 hours. After the initial plan is approved, EPA estimates one additional hour of burden (once per year for direct dischargers and twice per year for indirect dischargers) for facilities to verify that the plan is being implemented and to prepare the certification statement. However, EPA believes that facilities that are already regulated by the Metal Finishing Effluent Guidelines (40 CFR part 433) and that have a solvent management plan in place under those regulations will only require 20 hours to update their plan for the initial submittal. EPA estimates 7,200 facilties will choose to implement an organics management plan in lieu of monitoring.

Third, EPA is considering an alternate approach to the use of an organic indicator parameter (see Section XXI.C.2 for a discussion on the proposed organic indicator). EPA notes that this alternate approach is not being proposed in today's notice, but is being considered for the final rule. In this case, there would be some additional reporting and record keeping. MP&M facilities could choose an indicator pollutant parameter from a given set of choices. EPA would require facilities to demonstrate a correlation between the chosen indicator parameter and the regulated organic pollutants (*i.e.,* the TOP organic pollutants) found in their wastewater. EPA is soliciting comment on this approach and has estimated the burden of performing testing, analyzing analytical results, and keeping records that demonstrate a correlation between the regulated organic pollutants and the selected indicator parameter to be between 70 and 100 hours per facility once per permit cycle (*i.e.,* 5 years). If no major changes in processes or raw materials occur during that period, the demonstration would not have to be repeated for the next permit cycle. The Agency notes that the choice of an option would be voluntary. EPA has estimated less burden for direct dischargers than for indirect dischargers (*i.e,* 70 hours versus 100 hours) because the direct dischargers typically have more advanced treatment in place and permit writers typically require them to monitor for the types of parameters that EPA is considering as indicators (*e.g.,* COD, Oil & Grease, TOC, TPH), and therefore, may have data available that demonstrates a correlation to the regulated organic pollutants. EPA estimates that given the choice, approximately 515 facilities would choose to demonstrate and use a site-specific organic pollutant indicator.

Fourth, EPA is considering whether to allow certain facilities in the Metal Finishing Job Shops subcategory to demonstrate compliance with specified pollution prevention and water conservation practices (in addition to

maintaining compliance with the existing Metal Finishing and Electroplating Effluent Guidelines) in lieu of meeting the requirements of the MP&M regulation. EPA notes that this alternate approach is not being proposed in today's notice, but is being considered for the final rule. Facilities in the Metal Finishing Job Shops subcategory that do not wish to use the compliance alternative would need to meet the full requirements of the MP&M regulation as specified in today's proposed rule (see section XXI.D for a discussion of the Pollution Prevention Alternative). EPA has estimated the burden associated with preparing the associated certification statements to be 30 minutes each. Facilities would submit certification statements one time initially (by the compliance deadline) and twice per year thereafter for indirect dischargers, or once per year for direct dischargers. In addition, EPA estimates the burden associated with record keeping and reporting for the other related compliance paperwork to be 40 hours one time for the period of the permit or control mechanism (*i.e.,* five years). EPA is also soliciting comment on whether facilities in other subcategories should have a similar alternative. EPA estimates that if the Pollution Prevention Alternative were available to facilities in the Metal Finishing Job Shops Subcategory, 1,360 facilities would choose this alternative. In addition, EPA estimates that there would be 550 additional respondents if a limited number of other subcategories were able to choose this compliance alternative.

Finally, EPA is proposing to set numerical limitations on the discharge of Total Sulfide from facilities in several subcategories. In an effort to reduce monitoring burden on indirect dischargers, EPA is considering (but not proposing) to allow a waiver for the monitoring of total sulfide (even when present), at the discretion of the POTW, when a facility demonstrates that the sulfides will not generate acidic or corrosive conditions and will not create conditions that enhance opportunities for release of hydrogen sulfide gas in the sewer/interceptor collection system or at the receiving POTW or otherwise interfere with the operation of the POTW EPA estimates the burden associated to make such a demonstration is 100 hours. EPA would require this only one time per permit cycle and if no major changes in processes or raw materials occur during that period, the demonstration would not have to be repeated for the next permit cycle. EPA estimates that 4,420 facilities would be respondents under the total sulfide waiver if it were available.

The total burden for the two areas which are being proposed today is 437,070 hours for approximately 7,200 facilities [Note: approximately 5,200 facilities are expected to be respondents in both areas]. In addition, for the three areas that EPA is not proposing but is considering for the final rule, EPA estimates 565,595 hours for 6,845 respondents (some facilities may be respondents in more than one of the three areas). Labor costs are accounted for within the estimated burden hours. EPA estimates that there are no capital costs associated with these potential reporting and record keeping requirements. EPA estimates a reduction in the capital and operating and maintenance costs associated with monitoring to demonstrate compliance with numerical limits, particularly for the proposed monitoring waiver for indirect dischargers and the organics management plan.

In the cases discussed above, the data and information required by the proposed or considered information collection, reporting, or record keeping requirements can be claimed as confidential business information according to the regulations found in 40 CFR part 2. However, as specified at 40 CFR 2.302, effluent data submitted in response to these information and data requests can not be claimed as confidential.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR Chapter 15.

The Agency requests comments on its need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques. Send comments on the ICR to the Director, Collection Strategies Division; U.S. Environmental Protection Agency (2822); 1200 Pennsylvania Ave., NW., Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th St., NW., Washington, DC 20503, marked ''Attention: Desk Officer for EPA.'' Include the ICR number in any correspondence. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after January 3, 2001, a comment to OMB is best assured of having its full effect if OMB receives it by February 2, 2001. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

B. Unfunded Mandates Reform Act (UMRA)

1. UMRA Requirements

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

affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

Estimated total annualized before-tax costs of compliance for the proposed rule are $2,034 million ($1999). Of this total, $2,020 million is incurred by the private sector and $14 million is incurred by State and local governments that perform MP&M activities. Permitting authorities incur an additional $0.115 to $0.912 million to administer the rule, including labor costs to write permits and to conduct compliance monitoring and enforcement activities. Thus, EPA has determined that this rule contains a Federal mandate that may result in expenditures of $100 million or more for State, local, and Tribal governments, in the aggregate, or the private sector in any one year. Accordingly, EPA has prepared under section 202 of the UMRA a written statement which is summarized below.

2. Analysis of Impacts on Government Entities

Although the costs of implementation (and compliance for government-owned facilities) are approximately $15 million annually (*i.e.,* below the threshold specified in section 202) MP&M is a large industrial category and EPA fully analyzed the impacts on State and local governments. The proposed MP&M Rule will affect governments in two ways:

- Government-owned MP&M facilities may be directly affected by the MP&M regulation and therefore incur compliance costs; and
- Municipalities that own Publicly Owned Treatment Works (POTWs) that receive influent from MP&M facilities subject to the regulation may incur additional costs to implement the proposed rule. These include costs associated with permitting MP&M facilities that have not been previously permitted, and with repermitting some MP&M facilities earlier than would otherwise be required. In addition, POTWs may elect to issue mass-based permits to some MP&M facilities that currently have concentration-based permits, at an additional cost.

a. Compliance Costs for Government-Owned MP&M Facilities

EPA administered a survey (the ''Municipal Survey'') to government-owned facilities to assess the cost of the regulation on these facilities and the government entities that own them. (See Section V.B for a discussion of EPA's data collection efforts.) The survey responses provide the basis for EPA's analysis of the budgetary impacts of the proposed regulation, including the size and income of the populations served by the affected government entities; the government's current revenues by source, taxable property, debt, pollution control spending, and bond rating; and the costs, funding sources, and other characteristics of the MP&M facilities owned by each government entity. Table XXII.B–1 provides national estimates of the government entities that operate MP&M facilities potentially subject to the proposed rule. Table XXII.B–2 summarizes the annualized compliance costs incurred by government entities by regulatory option.

TABLE XXII.B–1.—NUMBER OF GOVERNMENT-OWNED FACILITIES BY TYPE AND SIZE OF GOVERNMENT ENTITY

Size of government and Status under proposed option	Municipal government	State government	County government	Regional governmental authority	Total
Large Governments (population > 50,000)					
Number of government entities > flow cutoff	60	183	77	0	319
Number of government entities ≤ flow cutoff	512	183	610	36	1,341
Small Governments (population <= 50,000)					
Number of government entities > flow cutoff	410	.....	.....	.....	410
Number of government entities ≤ flow cutoff	1,781	.....	481	.....	2,262
All Governments					
Number of government entities > flow cutoff	470	183	77	0	729
Number of government entities ≤ flow cutoff	2,293	183	1,091	36	3,603
Total	2,763	366	1,167	36	4,332

TABLE XXII.B–2.—NUMBER OF REGULATED GOVERNMENT-OWNED FACILITIES AND COMPLIANCE COSTS BY SIZE OF GOVERNMENT AND REGULATORY OPTION

	Proposed option		Option 2/6/10		Option 4/8	
	Number of facilities subject to regulation	Compliance costs (million 1999$)	Number of facilities subject to regulation	Compliance costs (million 1999$)	Number of facilities subject to regulation	Compliance costs (million 1999$)
Facilities Owned by Large Governments	319	$11.3	1,660	31.5	1,660	$101.3
Facilities Owned by Small Governments	410	2.6	2,672	33.3	2,672	123.4
All Government-Owned Facilities	729	13.9	4,332	64.8	4,332	224.7

Costs incurred by government-owned facilities, particularly for facilities owned by small governments, are substantially lower under the proposed rule than under the other two options considered. The lower costs result from

the exclusion of a large number of government-owned facilities under the proposed low flow cutoff.

b. Small Government Impacts

EPA's analysis also considered whether the proposed rule may significantly or uniquely affect small governments. Section XVI.B.3.c of today's notice describes the methodology used to assess budgetary impacts on governments. Briefly, EPA examined three measures to assess the affordability of new requirements. These three criteria incorporate measures of compliance costs (impacts on site-level cost of service), impacts on taxpayers, and impact on government debt levels.

EPA estimates that there are 2,672 facilities owned by small governments (*i.e.,* governments with a population of less than 50,000). The low flow exclusion in today's proposed rule will exclude 2,262 small government-owned MP&M facilities. Thus, the proposed rule covers 410 small government-owned facilities. Of these facilities, 140 incur no compliance costs under the proposed option, and the remaining 270 incur annualized costs that average less than $10,000 per facility. The total compliance cost for all the small government-owned facilities incurring costs under today's proposed rule is $2.6 million. Only 140 of the 270 facilities have costs greater than 1 percent of baseline cost of service (measured as total facility costs and expenditures, including operating, overhead and debt service costs and expenses). EPA estimated no significant impacts for any of the governments owning these facilities, based on the three budgetary criteria mentioned above. EPA has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. None of the affected governments are expected to incur significant budgetary impacts as a result of the proposed rule, and consequently, that the proposed rule will not significantly or uniquely affect small governments. Nonetheless, EPA did consult with small governments (see discussions on consultation in sections XXII.B.7 and XXII.C).

c. POTW Administrative Costs

EPA also analyzed the administrative costs incurred by local governments to implement the proposed rule. The results of this analysis are presented in section XVI.H.3. In summary, EPA estimates that POTWs will incur incremental average annualized costs over 15 years of between $115,000 and $912,000 under the proposed rule. The maximum expenditures by all affected POTWs in any one year will be between $186,000 and $1,607,000. These costs include issuing new permits to facilities that do not currently have permits, issuing mass-based permits to some facilities that currently have concentration-based permits, and repermitting some facilities sooner than would otherwise be required to meet the three-year compliance schedule. On average, a POTW's costs for the incremental permitting are only $23 to $184 for the 4,944 MP&M facilities permitted under the proposed rule. EPA expects that these increases in costs will be partially offset by reductions in government administrative costs for facilities that are already permitted under local limits and that will be repermitted under this rule.

3. Statutory Authority

The statutory authority for this rulemaking is as follows: Sections 301, 304, 306, 307, 308, 402 and 501 of the Clean Water Act, 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342 and 1361 and the Pollution Prevention Act of 1990, 42 U.S.C. 13101 *et seq.*, Pub L. 101–508, November 5, 1990. A consent decree with the Natural Resources Defense Council established a deadline of October 2000 for EPA to propose effluent limitations for this industry.

4. Costs and Benefits

The assessment of costs and benefits for this rule, including the assessment of costs to State, local, and Tribal governments and to the private sector, is discussed above and in Sections XVI (costs), XX (benefits) of this preamble. EPA prepared an extensive analysis of costs and benefits for private facilities and for governments, including analysis by size and by subcategory. In the most summarized form, EPA estimates the social cost of the proposed rule (which includes facility compliance costs) at $2.0 to $2.1 billion annually ($1999). The total value of benefits that can be expressed in dollar terms ranges from $0.4 billion to $1.1 billion. As discussed in Section XX, EPA solicits comment on several expansions to these benefit estimates. In particular, EPA includes in the public record for today's proposal, an extensive analysis of additional categories of benefits, such as boating and wildlife viewing. EPA also estimated values for these new categories, but pending public comment and peer review, did not incorporate the results from the new methodologies into the total monetized benefits of the proposed rule.

The Federal resources (*i.e.,* water pollution control grants) which are generally available for financial assistance to States are included in section 106 of the Clean Water Act. There are no Federal funds available to defray the costs of this rule on local governments.

5. Future Costs and Disproportionate Costs

The Unfunded Mandates Reform Act requires that EPA estimate, where accurate estimation is reasonably feasible, future compliance costs imposed by the rule and any disproportionate budgetary effects. EPA's estimates of the future compliance costs of this rule are discussed in detail in Section XVI.G of the preamble. Briefly, new sources in all but the Metal Finishing Job Shop direct discharger subcategory incur costs that are below one percent of post-regulation revenues, and costs for the Metal Finishing Job Shop indirect dischargers are less than three percent of estimated facility revenues. Cost increases of this magnitude are unlikely to place new facilities at a competitive disadvantage relative to existing sources. Moreover, costs as a percentage of revenues are generally comparable for new sources and existing sources with which they will compete.

EPA does not expect that the rule will have disproportionate budgetary effects on any particular areas of the country, particular governments or types of communities. The affected population of MP&M facilities is distributed throughout the country in settings from urban to rural, with more facilities likely to be located in larger urban areas. EPA therefore expects that the burden on governments to permit facilities under the rule, and the loss of employment due to closures caused by the rule, will be dispersed rather than concentrated in any specific area. Moreover, the proposed rule is expected to result in a net increase in employment over 15 years, when the employment associated with compliance activities is considered. A discussion of community impacts is included in Section XVI.

6. Effects on National Economy

The Unfunded Mandates Reform Act requires that EPA estimate the effect of this rule on the national economy where (1) accurate estimates are feasible and (2) the rule will have a ''material'' effect on the economy. EPA's estimates of the impact of this proposal on the national economy are described in Section XVI of this preamble and in the EEBA. The proposed rule is projected to result in closures or moderate financial impacts on a very small percentage of all MP&M

facilities, to result in only limited price increases in any MP&M sector, and to have a negligible impact on the U.S. balance of trade.

7. Consultation

In addition to private industry, our stakeholders include State and local government regulators. We consulted with all of these stakeholder groups on topics such as options development, cost models, pollutants to be regulated, cost of the regulation, and compliance alternatives. Some of the stakeholders provided helpful comments on the cost models, technology options, pollution prevention techniques, and monitoring alternatives.

Because many facilities affected by this proposal are indirect dischargers, the Agency involved POTWs as they will have to implement the rule. EPA consulted with POTWs individually and through the Association of Municipal Sewerage Agencies (AMSA). In addition, EPA consulted with pretreatment coordinators and State and local regulators.

The Agency collaborated with POTWs in selecting BAT facilities for EPA wastewater sampling and, in several cases, POTWs performed wastewater sampling and submitted the data to EPA for use in developing the rule. As described above and in Section V.B, EPA conducted the POTW survey to obtain estimates of POTW permitting costs and sludge disposal practices and costs. EPA assessed whether any impacts of the regulatory requirements in the rule might significantly or uniquely affect POTWs, especially small POTWs, and determined the degree to which POTWs would benefit from the regulation by having more options for sewage sludge disposal and decreased costs of disposing of the sludge.

EPA consulted with State and local regulators during three different public meetings. Their main comments focused on: (1) The potential burden on them to issue permits/control mechanisms for a large number of facilities that have not been permitted under effluent guidelines prior to this rule; (2) request for additional monitoring flexibilities; and (3) request to allow them to use concentration-based standards in the MP&M rule for those subcategories where it is difficult to obtain production or flow information at the process-level. EPA has incorporated many of their suggestions and addressed these concerns throughout today's preamble (see Sections II.D, XII.C, and XXI).

8. Alternatives Considered

EPA believes that the proposed rule is the least burdensome and most cost-effective of the regulatory alternatives considered that still meets the objectives of the rule. EPA acknowledges that the rule will impose some burden, but EPA believes that the additional costs are justified due to the additional pollutant removals. The proposed low-flow cutoffs and subcategory exemptions reduce the number of facilities that require permitting by over 90 percent. Section XVI.H presents EPA's analysis of the facility impacts of the proposed rule, which shows that facility compliance costs would be 36 percent higher under Option 2/6/10 than under the proposed rule and 120 percent higher under Option 4/8. Section XVII presents EPA's analysis of the cost-effectiveness of the regulatory options, which shows that the proposed option is the most cost-effective of these three options.

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

The Regulatory Flexibility Act generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedures Act or any other statute, unless the Administrator certifies that the rule will not have significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental organizations.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as (1) A small business according to the Regulations of the Small Business Administration (SBA) at 13 CFR 121.201, which define small businesses for Standard Industrial Classification (SIC) codes; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) small organization that is any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

In accordance with Section 603 of the RFA, EPA prepared an initial regulatory flexibility analysis (IRFA) that examines the impact of the proposed rule on small entities, along with regulatory alternatives that could reduce that impact. The IRFA is available for review in the public record (as Chapter 10 in the Economic, Environmental, and Benefits Analysis) and is summarized below.

1. Initial Regulatory Flexibility Analysis

a. Rationale, Objectives, and Legal Basis for Proposal

EPA's ''Preliminary Data Summary for the Machinery Manufacturing and Rebuilding Industry'' (EPA 440/1–89/106) identified the Metal Products and Machinery (MP&M) industry as one that is discharging wastestreams containing toxic pollutants to publicly owned treatment works and directly into the nation's surface waters. The volume and characteristics of these wastestreams are described more fully in Section VII of this notice. Due to the water quality, human health, and environmental concerns associated with these discharges, EPA selected the MP&M industry for the development of a new effluent guidelines regulation in 1990. The Agency develops categorical effluent limitations under authority of the Clean Water Act (33 U.S.C. 1251 *et seq.*). Section I of this notice discusses the legal basis for the proposed rule in more detail. Briefly, the Clean Water Act directs the Agency to reduce discharges of pollutants into the Nation's water and into publicly-owned treatment works. The objective of today's proposed rule is to reduce those discharges from the class of point sources in the MP&M industry.

b. Number and Type of Small Entities

A large number of the 63,000 MP&M facilities nationwide are owned by small entities. The small entities covered by this proposed rule are small businesses and small governmental jurisdictions. Table XXII.C–1 shows the total number of facilities operating in the baseline and the number owned by small entities. Overall, approximately 80 percent of all MP&M facilities are owned by small entities. However, it should be noted that the low flow exclusions in the proposed rule will exclude approximately 85 percent of the facilities owned by small entities.

TABLE XXII.C–1.—PERCENT OF MP&M FACILITIES OWNED BY SMALL ENTITIES

Type of Facility	Number of facilities operating in baseline	Number of facilities owned by small entities	Percent of facilities owned by small entities
Private MP&M*	54,591	44,773	82%
Government-Owned	4,332	2,672	62%
Total*	58,923	47,445	81%

* Excludes baseline closures.

The SBA definitions for small business use either employment-based or revenue-based standards, depending on the Standard Industrial Classification (SIC) code. The manufacturing sectors generally use employment-based standards, and most non-manufacturing sectors use revenue-based standards. MP&M facilities perform a wide variety of activities, represented by over 200 SIC codes. To assess the impacts of the rule on small entities, for analytical purposes, these SIC codes were organized into 18 industry sectors, with some further distinctions by type of activity (*i.e.,* manufacturing or maintenance/repair). To select a small business definition for each sector, EPA chose the SBA standard that was common to the most SIC Codes (*i.e.,* the mode of the distribution of SBA definitions) in a particular sector (or activity). Table XXII.C–2 lists the definitions by sector used in the impact assessment.

TABLE XXII.C–2.—SMALL BUSINESS DEFINITIONS FOR ANALYZING MP&M SECTORS

Sector and activity	Small business definition using the most common SBA standard for the SIC codes in each sector
Hardware	500 Employees.
Aircraft—Manufacturing	1,000 Employees.
Aircraft-Maintenance/Repair	$5 Million.
Electronic Equipment	750 Employees.
Stationary Industrial Equip.—Manufacturing	500 Employees.
Stationary Industrial Equip.—Maint/Repair	$5 Million.
Ordnance	1,000 Employees.
Aerospace	1,000 Employees.
Mobile Industrial Equip	500 Employees.
Instruments—Manufacturing	500 Employees.
Instruments—Maintenance/Repair	$5 Million.
Precious Metals/Jewelry—Manufacturing	500 Employees.
Precious Metals/Jewelry—Maintenance/Repair	$5 Million.
Ship—Manufacturing	1,000 Employees.
Ship—Maintenance/Repair	500 Employees.
Ship—Maintenance/Repair (SIC 449)[1]	$5 Million.
Household Equip.—Manufacturing	500 Employees.
Household Equip.—Maintenance/Repair	$5 Million.
Railroad—Manufacturing	1,000 Employees.
Railroad—Maintenance/Repair	1,500 Employees.
Motor Vehicle—Manufacturing	500 Employees.
Motor Vehicle—Maintenance/Repair	$5 Million.
Motor Vehicle—Maintenance/Repair (SIC 5013)[2]	100 Employees.
Bus & Truck—Manufacturing	500 Employees.
Bus & Truck—Maintenance/Repair	$5 Million.
Office Machines—Manufacturing	1,000 Employees.
Office Machines—Maintenance/Repair	$18 Million.
Steel Forming & Finishing	1,000 Employees.
Printed Circuit Boards	500 Employees.
Metal Finishing & Electroplating Job Shops	500 Employees.
Other Metal Products—Manufacturing	500 Employees.
Other Metal Products—Maintenance/Repair	$5 Million.

Notes:
[1] SIC Code 449—Includes 4491 (Marine Cargo), 4492 (Towing & tugboat service), 4493 (Marinas), and 4499 (Water Transportation Services, nec).
[2] SIC Code 5013—Wholesale distribution of motor vehicle supplies, tools and equipment; and new motor vehicle parts.

c. Impacts on Small Entities

For small businesses, EPA drew on the firm and facility impact analyses discussed in Section XVI of this notice to assess impacts on small entities. The analysis compared compliance costs to revenues for the small entities at the firm level. EPA also examined the facility impact analysis results for facilities owned by small firms. The facility impact analysis estimated facility closures and other adverse

changes to financial conditions (denoted here as ''moderate impacts''). See Section XVI.B of this notice for details on how EPA determines closures and moderate impacts for private businesses. The results from these analyses are discussed in more detail in the following paragraphs. Briefly, these analyses indicated that 941 of the small entities may incur costs equal to 3 percent or more of annual revenues, 181 facilities owned by small entities might close as a result of the proposed rule, and 492 facilities owned by small entities are likely to experience moderate financial impacts. The181 small entity facility closures represent less than one-half of one percent of the facilities owned by small entities that are operating in the baseline. Although the percentage of small facilities projected to incur impacts is quite small, the number, in absolute terms, was large enough for the Agency to conclude that a small business analysis was appropriate. After EPA considers comments and data received in response to this proposed rulemaking, especially with regard to the IRFA, the Panel's recommendations, and alternatives that would reduce small entity impacts, EPA will adjust the rule as appropriate and it is possible that the final rule will not have a significant economic impact on a substantial number of small entities. Consequently, there is a possibility that the Agency may not prepare a final regulatory flexibility analysis and would certify the final rule.

i. Compliance Costs as a Percent of Firm Revenue

EPA compared compliance costs to revenues at the firm level as a measure of the relative burden of compliance costs. Table XXII.C–3 shows the results of this comparison. The Agency was not able to estimate national numbers of firms that own MP&M facilities precisely, because the sample weights based on the survey design represent numbers of facilities rather than firms. The results in Table XXII.C–3 are reasonable approximations, however, in that 95 percent of the facilities owned by small firms are single-facility firms, for which sample weights could be used.

TABLE XXII.C–3.—FIRM LEVEL BEFORE-TAX ANNUAL COMPLIANCE COSTS AS A PERCENT OF ANNUAL REVENUES FOR PRIVATE SMALL BUSINESSES

Number of small firms in the analysis	Number and percent with before-tax annual compliance costs annual revenues equal to:					
	Less than 1%		1–3%		Over 3%	
	Number	Percent	Number	Percent	Number	Percent
42,509	40,560	95.4%	1,008	2.4%	941	2.2%

Approximately 85 percent of the small entities are not projected to incur any costs to comply with the proposed rule because they are among the facilities covered by the low flow exclusions (See Section XII for discussion of the low flow exclusions). Even so, the IRFA includes a cost analysis for all small facilities. The results reported here account for the exclusions. More than 95 percent of small entities incur compliance costs less than 1 percent of annual revenues. A small percentage (2 percent) of the small businesses in the analysis incur costs equal to 3 percent or more of annual revenues. (Results of the cost-to-sales ratios are presented in the EEBA.) Of the small firms that incur costs greater than 1 percent of revenues, 612 firms are projected by the facility impact analysis to close or experience moderate impacts.

ii. Facility Closures and Moderate Impacts

Table XXII.C–4 summarizes the results from the facility closure analysis for the proposed option for private facilities owned by small entities, by discharge status. Table XXII.C–4 also shows the number of facilities owned by small businesses that experience moderate impacts.

TABLE XXII.C–4.—CLOSURES AND MODERATE IMPACTS FOR PRIVATE FACILITIES OWNED BY SMALL ENTITIES

	All facilities	Indirect dischargers	Direct dischargers
Number of facilities operating in the baseline	44,773	41,536	3,237
Number of closures	181	161	20
Percent closing	0.40%	0.39%	0.62%
Number of facilities with moderate impacts	492	454	38
Percent with moderate impacts	1.1%	1.1%	1.2%

Again, approximately 85 percent of the facilities owned by small entities are not projected to incur any costs to comply with the proposed rule because they are among the facilities covered by the low flow exclusions. (See Section XII for discussion of the low flow exclusions.) The projected number of closures is very small compared to the large number of facilities owned by small entities. Less than one-half of one percent of the facilities owned by small entities that are operating in the baseline are projected to close. The percentage of small entities experiencing moderate impacts is also low, at one percent. In regard to the baseline closure analysis, to put this information in context, data on facility start-ups and closures from the Census *Statistics of U.S. Businesses* indicate that between 6 and 12 percent of facilities in the major metal products manufacturing industries close in any given year. (See discussion in Chapter 5 of the Economic, Environmental, and Benefits Analysis.)

iii. Impacts on Small Governments

For small governments, EPA relied on the analysis described in Section XVI.B.3.c. EPA estimates that there are 2,672 facilities owned by small governments. The low flow exclusion in today's proposed rule will exclude 2,262 of these small government-owned

MP&M facilities. Thus, the proposed rule covers 410 small government-owned facilities. Of these facilities, only 270 incur costs, and the average cost per facility is less than $10,000. The total compliance cost for all the small government-owned facilities incurring costs under today's proposed rule is $2.7 million. Only 140 of the 270 facilities have costs greater than 1 percent of baseline cost of service (measured as total facility costs and expenditures, including operating, overhead and debt service costs and expenses). EPA estimated no significant impacts for any of these facilities, based on three budgetary criteria (*i.e.,* impacts on site-level cost of service, impacts on taxpayers, and impact on government debt levels) as described in Section XVI.B.3.c . Thus, EPA concluded that none of the affected governments are expected to incur significant budgetary impacts as a result of the proposed rule.

d. Alternatives to the Proposed Rule

EPA sought from the outset to design a regulation that would not unreasonably burden small entities. In particular, EPA considered a number of regulatory alternatives for indirect and direct dischargers, and conducted extensive analysis of wastewater flow exclusions. As detailed in Section XII of this notice, EPA selected a regulatory alternative that incorporates low flow exclusions for several subcategories. The primary alternatives to the proposal, while providing additional pollutant reductions, also increased the number of small entities covered. These alternatives would have resulted in additional small entity impacts. The results from the closure analysis and the cost-to-revenue analysis for these alternatives are included in the IRFA, but are not summarized in this section of today's notice. As a result of selecting the low flow exclusions, the proposed rule imposes substantially lower impacts on small entities than the other options. In particular, the low flow exclusion for indirect discharging facilities in two subcategories—the General Metals subcategory and the Oily Wastes subcategory—played a significant role in minimizing small business impacts. EPA estimates that there are over 26,000 facilities in the General Metals subcategory and over 28,000 in the Oily Wastes subcategory operating in the baseline, and that small entities comprise a large portion of these subcategories. The low flow exclusion for both of these subcategories will largely reduce the number of small entities affected by the MP&M proposed rule. For the General Metals subcategory, EPA is proposing a 1 MGY flow cutoff for the reasons explained in Section XII.D. This low flow exclusion reduces the number of regulated facilities in this subcategory by 75 percent. The facilities that comprise the 75 percent are mostly small entities and represent only 6 percent of the total pollutants discharged by the facilities in this subcategory. For the Oily Wastes subcategory, EPA is proposing a 2 MGY flow cutoff for the reasons explained in Section XII. This low flow exclusion reduces the number of regulated facilities in this subcategory by 96 percent. The facilities that comprise the 96 percent are mostly small entities and represent 39 percent of the total pollutant discharged by the facilities in this subcategory. In Section XII, EPA presented its rationale for concluding that national pretreatment standards were not warranted for facilities discharging less than 2 MGY in this subcategory.

EPA considered and incorporated other types of alternatives, such as monitoring alternatives. These are summarized below and discussed more fully in Sections XXI.C and XXI.D of today's notice.

e. Reporting, Record Keeping and Other Compliance Requirements

There are five areas for which EPA is proposing to require, or considering requiring, reporting or record keeping by MP&M facilities: (1) Certification to waive monitoring for pollutants that are not present; (2) certification and implementation of an organic chemicals management plan in lieu of monitoring for organic pollutants; (3) demonstration of a correlation to a site-specific organic pollutant indicator parameter; (4) certification of a total sulfide monitoring waiver for indirect dischargers; and (5) demonstration of specified pollution prevention practices and compliance with existing regulations in lieu of compliance with the MP&M effluent guidelines for facilities in the Metal Finishing Job Shop subcategory and some facilities in other subcategories. In all cases, EPA believes the collection of information, reporting, or record keeping is an alternative (*i.e.,* voluntary) that will allow a reduction in overall burden to facilities since EPA intends for these activities to reduce or eliminate effluent sampling and analysis costs. Each of these five areas is briefly described below and is described in detail in section XXI, and the associated burden is discussed in section XXII.A.

Briefly, for the certification to waive monitoring for pollutants that are not present, EPA expects that facilities will need to review analytical sampling data and other technical information required to make the certification (*e.g.,* raw material inventory logs, production information, product chemistry, and reports on source water). There is some additional effort required to prepare the certification statement one time per permit cycle (*i.e.,* every 5 years). EPA is allowing the use of historical sampling data as well as sampling data generated for compliance reports required by the General Pretreatment Standards (40 CFR 403.12) in the development of the certification statement. Therefore, EPA does not anticipate additional monitoring burden associated with this waiver, particularly in comparison to the periodic compliance monitoring that is being replaced by this waiver. A wastewater treatment operator or other qualified facility personnel who is familiar with the facility's processes, products and analytical monitoring reports can make the determination.

In terms of the certification and implementation of an organic chemicals management plan in lieu of monitoring for organic pollutants, facilities choosing to develop an organic pollutant management plan must certify that the procedures described in the plan are being implemented at the facility. EPA notes that development and implementation of the plan would likely require the attention of the wastewater treatment operator or plant manager. EPA believes that facilities covered by the Metal Finishing effluent guidelines (40 CFR part 433) with a solvent management plan in place under those regulations will only have to update their plan.

EPA is considering (but is not proposing) allowing the demonstration of a correlation to a site-specific organic pollutant indicator parameter as an alternate approach to the use of an organic indicator parameter (see section XXI.C.2 for a discussion on the proposed organic indicator). In this case, there would be some additional reporting and record keeping. Facilities would need to perform testing, analyze analytical results, and keep records that demonstrate a correlation between the regulated organic pollutants and the selected indicator parameter. EPA notes that direct dischargers may incur less burden than indirect dischargers because they typically have more advanced treatment in place and permit writers typically require them to monitor for the types of parameters that EPA is considering as indicators (*e.g.,* COD, Oil & Grease, TOC, and TPH); therefore, they may already have data available that demonstrates a correlation to the regulated organic pollutants. A wastewater treatment operator or other qualified facility personnel who is

familiar with the facility's processes, products, and analytical monitoring reports should be able to make the determination. Some facilities may prefer consultation with an analytical chemist.

EPA is proposing to set numerical limitations on the discharge of total sulfide from facilities in several subcategories. In an effort to reduce monitoring burden on indirect dischargers, EPA is considering (but not proposing) to allow a waiver for the monitoring of total sulfide (even when present). EPA would require this demonstration one time per permit cycle and if no major changes in processes or raw materials change during that period, the demonstration would not have to be repeated for the next permit cycle. A wastewater treatment operator or other qualified facility personnel who is familiar with the facility's processes, products, and analytical monitoring reports can make the determination.

Finally, EPA is considering, but not proposing, whether to allow certain facilities in the Metal Finishing Job Shop subcategory to demonstrate compliance with specified pollution prevention and water conservation practices (in addition to maintaining compliance with the existing Metal Finishing and Electroplating effluent guidelines) in lieu of meeting the requirements of the MP&M regulation. Facilities would submit certification statements one time initially (by the compliance deadline) and twice per year thereafter for indirect dischargers, or once per year for direct dischargers. The compliance paperwork necessary to implement this alternative would likely require the attention of the wastewater treatment operator or plant manager.

f. Overlapping Federal Rules

EPA has established effluent guidelines regulations for thirteen industrial categories which may perform operations that are sometimes found in MP&M facilities. These effluent guidelines are:

- Electroplating (40 CFR part 413);
- Iron and Steel Manufacturing (40 CFR part 420);
- Nonferrous Metals Manufacturing (40 CFR part 421);
- Ferroalloy Manufacturing (40 CFR part 424);
- Metal Finishing (40 CFR part 433);
- Battery Manufacturing (40 CFR part 461);
- Metal Molding and Casting (40 CFR part 464);
- Coil Coating (40 CFR part 465);
- Porcelain Enameling (40 CFR part 466);
- Aluminum Forming (40 CFR part 467);
- Copper Forming (40 CFR part 468);
- Electrical and Electronic Components (40 CFR part 469); and
- Nonferrous Metals Forming and Metal Powders (40 CFR part 471).

In 1986, the Agency reviewed coverage of these regulations and identified a significant number of metals processing facilities discharging wastewater that these 13 regulations did not cover. As discussed above, EPA's ''Preliminary Data Summary for the Machinery Manufacturing and Rebuilding Industry'' (EPA 440/1–89/106) identified the MP&M industry as one that is discharging hazardous wastes to publicly owned treatment works and directly into the nation's surface waters.

EPA recognizes that in some cases, unit operations performed in industries covered by the existing effluent guidelines are the same as unit operations performed at MP&M facilities. In general, when unit operations and their associated wastewater discharges are already covered by an existing effluent guideline, they will remain covered under that effluent guideline. However, for the existing Electroplating (40 CFR part 413) and Metal Finishing (40 CFR part 433) effluent guidelines most facilities will be covered by this proposal. EPA is proposing to replace the existing Electroplating (40 CFR part 413) and Metal Finishing (40 CFR part 433) effluent guidelines with the MP&M regulations for all facilities in the Printed Wiring Board subcategory, all facilities in the Metal Finishing Job Shop subcategory, and for direct discharging facilities in the Non-Chromium Anodizers subcategory. (See Section VI.C for a discussion of subcategory-specific applicability).

When a facility covered by an existing metals effluent guidelines (other than Electroplating or Metal Finishing) discharges wastewater from unit operations not covered under that existing metals guideline but covered under MP&M, the facility will need to comply with both regulations. In those cases, the permit writer or control authority (*e.g.,* Publicly Owned Treatment Works) will combine the limitations using an approach that proportions the limitations based on the different in-scope production levels (for production-based standards) or wastewater flows. POTWs refer to this approach as the ''combined wastestream formula'' (40 CFR 403.6(e)), while NPDES permit writers refer to it as the ''building block approach.'' Permit writers and local control authorities currently issue permits and control mechanisms for many facilities in other effluent guidelines categories where overlaps with more than one effluent limitation guidelines regulation occur (*e.g.,* Organic Chemicals, Plastics, and Synthetic Fibers; Pesticide Manufacturing; Pesticide Formulating, Packaging and Repackaging; and Pharmaceutical Manufacturing). See Section III.D of this preamble for additional discussion of applicability.

2. Small Business Advocacy Review Panel

As required by section 609(b) of the RFA, as amended by SBREFA, EPA also conducted outreach to small entities and convened a Small Business Advocacy Review Panel to obtain advice and recommendations of representatives of the small entities that potentially would be subject to the rule's requirements. The Panel consisted of representatives from three Federal agencies: EPA, the Small Business Administration, and the Office of Management and Budget. The Panel reviewed materials EPA prepared in connection with the IRFA, and collected the advice and recommendations of small entity representatives. For this proposed rule, the small entity representatives included nine small MP&M facility owner/operators, one small municipality, and the following six trade associations representing different sectors of the industry: National Association of Metal Finishers (NAMF)/Association of Electroplaters and Surface Finishers (AESF)/MP&M Coalition; the Association Connecting Electronics Industries (also known as IPC); Porcelain Enamel Institute; American Association of Shortline Railroads (ASLRA); Electronics Industry Association (EIA); and the American Wire Producers Association (AWPA). Prior to and following the convening of the Panel, EPA and the other members of the Panel sought to gather advice and recommendations by meeting and consulting with the small entity representatives listed above. On September 16, 1999 and October 5, 1999, EPA held pre-Panel meetings with the potential small entity representatives to provide background information on the MP&M regulation and EPA's regulatory process and to provide detailed information on the elements of the IRFA including possible regulatory alternatives. After EPA's Small Business Advocacy Chair convened the Panel on December 8, 1999, the Panel provided over 300 pages of background information and analysis to the small entity representatives and met with the representatives on

December 17, 1999 and January 7, 2000. The Panel asked the small entity representatives to submit written comment on the MP&M rulemaking in relation to the elements of the IRFA. The Panel carefully considered these comments when developing its recommendations.

Consistent with the RFA/SBREFA requirements, the Panel evaluated the assembled materials and small-entity comments on issues related to the elements of the IRFA and prepared a report. The report summarizes the Panel's outreach efforts to small entities and the comments submitted by the small entity representatives. The Panel's report also presents their findings on issues related to the elements of an IRFA and recommendations regarding the rulemaking. EPA included a copy of the Panel report in the docket for this proposed rule.

In the area of potential reporting, record keeping and compliance requirements, the Panel recommended that EPA consider reduced monitoring schemes for small entities including incorporating several concepts of the proposed EPA NPDES Streamlining regulations (''Amendments to Streamline the National Pollutant Discharge Elimination System Program Regulations: Round 2; Proposed Rule'' 61 FR 65268; December 11, 1996). For example, the Panel ''encourages EPA to explore options for allowing certification in lieu of monitoring where an operator can determine, based on knowledge of the facility and its processes, that certain pollutants are not likely to be present or are adequately controlled.'' Based on the Panel's recommendations, EPA is proposing to allow MP&M indirect discharge facilities to apply for a waiver that will allow them to reduce their monitoring burden. In order for a facility to receive a monitoring waiver, the facility must submit a certification statement in writing to the control authority (*e.g.,* POTW) stating that the facility does not use nor generate in any way a pollutant (or pollutants) at their site or that the pollutant (or pollutants) is present only at background levels from intake water and without any increase in the pollutant due to activities of the discharger. EPA notes that the NPDES streamlining for direct dischargers, which includes a similar provision, was finalized on May 15, 2000 (65 FR 30886).

The Panel also recommended that EPA give serious consideration to allowing the use of best management practices (BMPs) instead of numerical limitations, at least for some pollutants and/or subcategories of facilities. In response to this recommendation, EPA is soliciting comment and data on a ''Pollution Prevention Alternative for the Metal Finishing Job Shop Subcategory.'' This alternative would allow facilities in the Metal Finishing Job Shop subcategory to implement a set of pollution prevention measures in lieu of monitoring for a set of regulated parameters. The Agency is also soliciting comment on allowing facilities in other subcategories to comply with this pollution prevention alternative. EPA fully describes this potential alternative in Section XXI.D.

In relation to proposing an indicator for toxic organic constituents to reduce the burden of monitoring for specific organic pollutants, the Panel recommended that EPA attempt to identify an appropriate organic indicator if it turns out that limitations for organic pollutants are appropriate for one or more subcategories. However, the Panel also recommended that if organic pollutant removals by subcategory are not higher than levels in the preliminary analysis provided to the Panel, then EPA should give serious consideration to not proposing pretreatment standards for those pollutants in those subcategories. In response to this recommendation, the Agency is proposing several alternatives for organic pollutant monitoring. EPA is proposing to allow the use of Total Organic Carbon (TOC) as an indicator parameter for organic pollutants found in the wastewater discharges at MP&M facilities. The indicator is an alternative limit. If facilities do not wish to use TOC as an indicator, EPA is proposing two other alternatives. The second alternative allows facilities to monitor for a list of organic pollutants (*i.e.,* total organics parameter (TOP) list) and to meet a limit which would equate to the summation of all quantifiable values of the listed organic pollutants. The third alternative allows facilities to develop and certify the implementation of an ''organic chemical management plan.'' The Agency further discusses these organic monitoring alternatives in Section XXI.C.

The Panel also recommended that EPA not regulate TSS, pH, iron, or aluminum for indirect dischargers. The Agency is not proposing pretreatment standards for any of these parameters.

In the area of overlap with other Federal rules, the Panel recommended that EPA attempt to minimize the potential for MP&M facilities to be covered by more than one effluent guideline and that EPA clarify in the preamble how it plans to regulate facilities that have operations covered by more than one effluent guideline. In response to this recommendation, EPA has made an effort to clearly define the applicability of the proposed MP&M rule. In addition, EPA is replacing the Metal Finishing (40 CFR part 433) and Electroplating (40 CFR part 413) effluent guidelines for a large number of facilities. Therefore, these facilities will only be covered by the MP&M rule.

The Panel recommended that EPA consider regulatory alternatives, including a ''no regulation'' option, to reduce any significant economic impacts that are not justified by environmental improvements and to improve the cost-effectiveness of the regulation. In response to these recommendations, the Agency is proposing low flow exclusions for two subcategories and is proposing not to establish pretreatment standards for three other subcategories based on low levels of pollutants discharged. EPA discusses these issues throughout this notice (see Sections II.D, VI.C, and XII for detailed discussions of the proposed flow cutoff (or no regulation) by subcategory).

Additionally, as recommended by the Panel, EPA has solicited data and comment on the following topics discussed in the Panel report: the cost savings to Control Authorities and dischargers of BMPs in lieu of numerical limitations; in-process versus end-of-pipe monitoring for cyanide; inclusion of the steel wire producers in the proposed rule; costs for contract hauling; certain methodological issues, including costs and adequacy of operational changes or treatment enhancements for BAT facilities to consistently and reliably achieve full compliance with proposed limitations; the POTW removals methodology; and the revision to the Toxic Weighting Factors. EPA invites comments on all aspects of the proposal and its impacts on small entities (see Section XXIII for a specific request for comment on each of these issues).

D. Executive Order 12866: Regulatory Planning and Review

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

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or

State, local, or Tribal governments or communities;

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

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

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

Pursuant to the terms of Executive Order 12866, it has been determined that this rule is a ''significant regulatory action.'' As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

E. Executive Order 13132: Federalism

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

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. The rule establishes effluent limitations imposing requirements that apply to metal product and machinery facilities, as defined by this preamble, when they discharge wastewater. The rule applies to States and localities when they own and operate an in-scope MP&M facility. EPA estimates 4,300 MP&M facilities are owned and operated by State and local governments. Only 730 of these 4,300 facilities discharge MP&M process wastewater at levels above the flow exclusions for the General Metals and Oily Wastes subcategories (1 MGY and 2 MGY, respectively).

In addition, this proposed rule will affect State and local governments when they are administering CWA permitting programs. The proposed rule, at most, imposes minimal administrative costs on States that have an authorized NPDES program. (These States must incorporate the new limitations and standards in new and reissued NPDES permits). In an effort to minimize this administrative burden, EPA has incorporated a low flow cutoff for indirect dischargers in the two largest subcategories (*i.e.,* General Metals and Oily Waste) to reduce permitting burden on POTWs related to permitting the smallest MP&M facilities (see Sections II.D, VI.C, and XII for discussions on the proposed low flow exclusion). The total cost of today's proposal to governments (including regulated MP&M government-owned facilities and regulators) is less than $15 million. Thus, Executive Order 13132 does not apply to this rule. See Section XXII.B for a discussion of the administrative costs to State and local governments.

Although Executive Order 13132 does not apply to this rule, EPA did consult with State and local government representatives in developing this proposal. EPA developed and administered a survey questionnaire to collect information from POTWs on the burden of implementing permits for MP&M facilities (see Section V.B.5 for a information on the POTW survey questionnaire). In addition, EPA attended several industry and professional meetings such as the National Metal Finishing Strategic Goals Summit and the annual meetings of the Association of Municipal Sewerage Authorities (AMSA) to talk to States and local governments (and other stakeholders) about the MP&M proposed rule including several possible alternative options for monitoring. States and local government representatives were also present at EPA's public meetings on the MP&M proposed rule (see Section V.E of this notice for a discussion on public outreach efforts). Section II.D summarizes many of the major concerns expressed by MP&M stakeholders (including State and local governments) during the development of this proposal.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

F. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

1. E.O. 12898 Requirements

Executive Order 12898 requires that, to the greatest extent practicable and permitted by law, each Federal agency must make achieving environmental justice part of its mission. E.O. 12898 provides that each Federal agency must conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

2. Environmental Justice Analysis

EPA examined whether the proposed regulation will promote environmental justice in the areas affected by MP&M discharges. This analysis first examines whether the proposed rule specifically reduces risks to disadvantaged populations. EPA then examined whether MP&M discharges have a disproportionally high environmental impact on minority populations based on the demographic characteristics of the populations residing in the counties affected by MP&M discharges.

a. Changes in Health Risk for Subsistence Anglers

Subsistence anglers include low-income and minority populations that rely heavily on subsistence fishing in their food supply. Subsistence anglers are likely to be at disproportionally high risk from consumption of contaminated fish because of heavy reliance on fish caught in local waters in their diets. EPA's analysis of changes in adverse health effects from the proposed rule show that benefits to subsistence anglers substantially exceed benefits to recreational anglers.

EPA used the same methodology for estimating cancer and systemic health risk used in the national human health benefits analysis to estimate changes in health risk to subsistence anglers. EPA's estimates show that subsistence anglers face significantly higher cancer risk from fish consumption than recreational anglers at the baseline discharge levels. The estimated average lifetime cancer risk in the baseline for subsistence and recreational anglers is 20.3 in a million and 8.08 in a million, respectively. The estimated reduction in average lifetime cancer risk for subsistence anglers is more than double the reduction in risk for sport anglers (*i.e.,* 7.70 in a million vs. 3.77 in a million) (see Table XXII.F–1).

TABLE XXII.F–1.—ESTIMATED CHANGES IN LIFETIME CANCER RISK TO SUBSISTENCE VS. RECREATIONAL ANGLERS

Exposed population category	Average lifetime cancer risk per individual				Estimated changes in individual lifetime cancer risk		
	Baseline	Proposed option	Option 2/6/10	Option 4/8	Proposed option	Option 2/6/10	Option 4/8
Subsistence Anglers	20.3E–06	12.6E–06	12.4E–06	12.8E–06	7.7E–06	7.9E–06	7.5E–06
Recreational Anglers	8.1E–06	4.3E–06	4.3E–06	4.5E–06	3.8E–06	3.8E–06	3.6E–06

EPA also analyzed changes in systemic health risk from fish consumption to subsistence anglers. This analysis is performed at the sample level only. The results from this analysis show that approximately 7,000 subsistence anglers (two percent) in reaches near sample facilities are estimated to ingest MP&M pollutants at rates sufficient to pose a significant risk of health effects at the baseline discharge levels. The proposed regulation reduces the number of subsistence anglers at risk of developing deleterious health effects by 4,616 (66 percent) (see Table XXII.F–2.).

TABLE XXII.F–2.—CHANGES IN SYSTEMIC HEALTH RISK TO SUBSISTENCE ANGLERS (SAMPLE BASIS)

Regulatory status	Total exposed subsistence anglers	Subsistence anglers exposed to hazard ratio >1 [a]		Subsistence anglers benefitting from the MP&M rule	
		Number of individuals	Percent of total exposed individuals	Number of individuals	Percent of baseline
Baseline	320,366	6,971	2.18	.....	.....
Proposed option	320,366	2,355	0.74	4,616	66
Option 2/6/10	320,366	2,355	0.74	4,616	66
Option 4/8	320,366	2,355	0.74	4,616	66

[a] Hazard ratio is a ratio of the estimated ingestion rate of a pollutant to the reference dose (RfD) value for the pollutant. The RfD is an estimate of the maximum daily ingestion rate in mg/kg per day that is likely to be without an appreciable risk of deleterious effects during a lifetime. A hazard ratio greater than one indicates that individuals would be expected to ingest MP&M pollutants at rates sufficient to pose a significant risk of systemic health effects.

b. Demographic Characteristics of the Populations Residing in the Counties Affected by MP&M Discharges

EPA assessed whether adverse environmental, human health, or economic effects associated with MP&M facility discharges are more likely to be borne by minorities and low-income populations. This analysis is based on information on the race, national origin, and income level of populations residing in the counties traversed by reaches receiving discharges from 885 sample MP&M facilities. The analysis was not done at the national level. The 885 sample facilities are located in 643 counties in 46 States (excluding Alaska, Hawaii, Nevada, and Wyoming). Two sample facilities that are located in Puerto Rico were excluded from this analysis due to insufficient data.

EPA compared demographic data on the counties traversed by sample MP&M reaches with the corresponding state-level indicators. The results of this analysis show that counties affected by MP&M discharges tend to have a larger proportion of African-American population than the State average in 41 States. In five States, the proportion of African-Americans in MP&M counties corresponds to the State averages (District of Columbia, North Carolina, South Carolina, Vermont, and West Virginia). Other socioeconomic characteristics of the populations residing in the counties abutting reaches affected by MP&M discharges reflect the corresponding State averages.

3. Findings

Findings from the EPA's analysis show that this proposed rule is expected to promote environmental justice in the areas affected by MP&M discharges. EPA's analysis of changes in adverse health effects from the proposed rule indicate that health benefits to 3.8 million subsistence anglers substantially exceed benefits to recreational anglers. The estimated reduction in annual cancer risk is an order of magnitude greater for subsistence than for sport anglers (*i.e.,* 0.5 in one hundred million vs 0.5 in one billion). The proportion of subsistence anglers that face a hazard ratio of greater than one under the baseline conditions (2.2 percent) declines by 1.5 percent due to the proposed rule (see Table XXII.F–2). [Note: the hazard ratio is a ratio of the estimated ingestion rate of a pollutant to the reference dose (RfD) value point. A hazard ratio greater than one indicates that individuals would be expected to ingest MP&M pollutants at rates sufficient to pose a significant risk of systemic health effects.] A much smaller proportion of recreational anglers (0.15 percent) is expected to suffer from systemic health risk effects under the baseline conditions. The percentage of recreational anglers facing a hazard ratio of one drops to 0.05 percent under the post-compliance. Higher representation of African-American households in the areas where most MP&M sample facilities are located and their effluents are released indicates that the disadvantaged populations will receive a relatively larger share of the benefits from the MP&M rule, though they may also bear a disproportionate share of costs if the MP&M facilities that close are in their community (*e.g.,* lost jobs).

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

1. E.O. 13045 Requirements

The Executive Order ''Protection of Children From Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a

disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children; and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency. This proposed rule is subject to the Executive Order because it is an economically significant regulatory action as defined by E.O. 12866. It is expected to reduce numerous pollutants, including lead, in fish tissue and drinking water that exceed human health criteria for consumption of water and organisms and organisms only. Therefore, EPA has performed an analysis of children's health impacts reduced by this proposed rule.

2. Analysis of Children's Health Impacts

EPA expects that the proposed regulation will benefit children in many ways, including reducing health risk from exposure to MP&M pollutants from consumption of contaminated fish tissue and drinking water and improving recreational opportunities. The Agency was able to quantify only one category of benefits to children, however—avoided health damages to pre-school age children from reduced exposure to lead. This analysis considered several measures of children's health benefits associated with lead exposure for children up to age six. Avoided neurological and cognitive damages were expressed as changes in three metrics: (1) Overall IQ levels, (2) the incidence of low IQ scores (<70), and (3) the incidence of blood-lead levels above 20 mg/dL. The Agency also assessed changes in incidence of neonatal mortality from reduced maternal exposure to lead. EPA's methodology for assessing benefits to children and adults is presented in Section XX.B.3.c. This analysis showed that the proposed rule is expected to yield $14.4 million (1999$) in annual benefits to children from reduced neurological and cognitive damages and reduced incidence of neonatal mortality.

The Agency also examined whether lead discharges from MP&M facilities are likely to have a disproportionate impact on children in subsistence anglers' families. Children in subsistence fishing families face a greater risk of adverse health effects from exposure to lead-contaminated fish due to high proportion of fish from local waters in their diet. EPA's analysis showed that the beneficial outcome of the MP&M rule favor children from subsistence fishing families. The average estimated health risk reduction per child for each of the four lead-related health effects was much larger for children from subsistence fishing families. This finding is also supported by the monetary estimates of benefits per child in each population category. EPA estimated that the monetary value of benefits to a child from a subsistence fishing family is $781.2 (1999$) per year, as compared to $82.6 (1999$) for a child from a recreational fishing family. These benefits comprise a much larger portion of subsistence fishing families income compared to the benefits received by a recreational fishing because subsistence fishing families (*e.g.,* Native American families) have on average a lower household income. EPA estimated that the monetary value of benefits from reduced cognitive damages to children for a subsistence household is about 2.9 percent of their current household income, while benefits for a recreational fishing family is 0.2 percent of their household income. This analysis uses average household income in Native American families and average household income of all households in the United States. Table XXII.G–1 summarizes estimated changes in health risk and the monetary value of benefits to children from recreational and subsistence fishing families.

TABLE XXII.G–1.—ESTIMATED BENEFITS TO PRE-SCHOOL CHILDREN FROM REDUCED EXPOSURE TO LEAD

Benefit category	Population category	Number of children (ages 0 to 1)	Reduction in the number of adverse health effect cases	Estimated monetary value of avoided health damages to children (1999$)—mean estimates	
				Total	Per child
Preferred Option					
Neo-Natal Mortality	Recreation		0.92	$5,536,000	$47
	Subsistence		0.69	$4,002,000	$609
Avoided IQ Loss	Recreation		390.43	$3,934,410	$30
	Subsistence		98.65	$994,104	$151
Reduced IQ <70	Recreation		0.02	$101,311	$1
	Subsistence		0.09	$25,079	$4
Reduced PbB >20	Recreation		0.03	$686	(1)
	Subsistence		0.06	$60	(1)
Total	Recreation	131,511		$9,372,407	$83
	Subsistence	6,576		$5,021,243	$764
	All Children	138,087		$14,393,650	$120
Option 2/6/10					
Neo-Natal Mortality	Recreation		0.95	$5,510,000	$49
	Subsistence		0.71	$4,118,000	$626
Avoided IQ Loss	Recreation		402.75	$4,058,465	$31
	Subsistence		101.74	$1,025,276	$156
Reduced IQ <70	Recreation		0.02	$104,529	$1
	Subsistence		0.09	$25,866	$4
Reduced PbB >20	Recreation		0.03	$609	(1)
	Subsistence		0.04	$36	(1)
Total	Recreation	131,511		$9,546,407	$84
	Subsistence	6,576		$5,013,243	$781

TABLE XXII.G–1.—ESTIMATED BENEFITS TO PRE-SCHOOL CHILDREN FROM REDUCED EXPOSURE TO LEAD—Continued

Benefit category	Population category	Number of children (ages 0 to 1)	Reduction in the number of adverse health effect cases	Estimated monetary value of avoided health damages to children (1999$)—mean estimates	
				Total	Per child
	All Children	138,087		$14,683,650	$122
Option 4/8					
Neo-Natal Mortality	Recreation		0.95	$5,510,000	$49
	Subsistence		0.71	$4,118,000	$626
Avoided IQ Loss	Recreation		402.75	$4,058,465	$31
	Subsistence		101.74	$1,025,276	$156
Reduced IQ <70	Recreation		0.02	$104,529	$1
	Subsistence		0.09	$25,866	$4
Reduced PbB >20	Recreation		0.03	$609	(1)
	Subsistence		0.04	$36	(1)
Total	Recreation	131,511		$9,673,603	$85
	Subsistence	6,576		$5,169,178	$786
	All Children	138,087		$14,842,781	$124

[1] Negligible.

Children over age six are also likely to benefit from reduced neurological and cognitive damages due to reduced exposure to lead. Recent research on brain development among 10-to 18-year-old children shows unanticipated and substantial growth in brain development, mainly in the early teenage years (Giedd *et al.,* 1999). This research suggests that older children may be hypersensitive to lead exposure, as are children aged 0 to 6.

Additional benefits to children from reduced exposure to lead not quantified in this analysis may include prevention of the following adverse health effects: slowed or delayed growth, delinquent and anti-social behavior, metabolic effects, impaired heme synthesis, anemia, impaired hearing, and cancer.

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

Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian Tribal governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the Tribal governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide to the Office of Management and Budget, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected Tribal governments, a summary of the nature of their concerns, and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian Tribal governments ''to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.''

Today's rule does not significantly or uniquely affect the communities of Indian Tribal governments. Based on the information collection efforts for this industry category, EPA does not expect any Indian Tribal governments to own or operate in-scope MP&M facilities. In addition, given the proposed applicability thresholds (*i.e.,* low flow exclusions for the General Metals and Oily Wastes subcategories), EPA estimates that few, if any, new facilities subject to the rule will be owned by Tribal governments. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this rule.

I. National Technology Transfer and Advancement Act

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

Although today's proposed rule does not establish new analytical methods, it does require dischargers to monitor for TSS, O&G (as HEM), Total Organic Carbon (TOC), Aluminum, Cadmium, Chromium, Copper, Cyanide (T), Cyanide (A), Lead, Manganese, Molybdenum, Nickel, Silver, Sulfide (as S), Tin, and Zinc. (EPA notes that the pollutants listed may not be regulated for all subcategories). All of these analytes can be measured by EPA methods and many using consensus standards that are specified in the tables at 40 CFR part 136.3. EPA is also proposing a limit for Total Organics Parameter (TOP), as part of an organic monitoring alternative. (See Section XXI.C.2). EPA developed the TOP list of organic pollutants using the list of organic priority pollutants and other non-conventional organic pollutants that met EPA's ''pollutant of concern'' criteria for this rule (see section VII for a discussion on the selection of the MP&M pollutants of concern). Of the nonconventional organic chemicals on the MP&M pollutant of concern list, EPA included only those that were removed in appreciable quantities (based on toxic weighted pound-equivalents) in two or more subcategories. See appendix B to part 438 in the proposed rule accompanying

this notice for a list of organic pollutants that comprise the proposed Total Organics Parameter (TOP). The following analytes that EPA is proposing to comprise the TOP do not have approved EPA methods: Benzoic acid, carbon disulfide, 3,6-Dimethylphenanthrene, 2-Isopropylnaphthalene, 1-Methylfluorene, and 2-Methylnaphthalene. In addition, aniline and 1-Methylphenanthrene do not have procedures approved in 40 CFR part 136, but have procedures that have been validated as attachments to EPA Methods 1625/625. EPA plans to promulgate methods or validate the procedures for these analytes prior to the promulgation of the MP&M rule. EPA welcomes comments on this aspect of the proposed rulemaking and, specifically, invites the public to identify potentially applicable voluntary consensus standards and to explain why such standards should be used in this regulation.

J. Plain Language Directive

Executive Order 12866 and the President's memorandum of June 1, 1998, require each agency to write all rules in plain language. We invite your comments on how to make this proposed rule easier to understand. For example, have we organized the material to suit your needs? Are the requirements in the rule clearly stated? Does the rule contain technical language or jargon that isn't clear? Would a different format (grouping and order of sections, use of headings, paragraphing) make the rule easier to understand? Would more (but shorter) sections be better? Could we improve clarity by adding tables, lists, or diagrams? What else could we do to make the rule easier to understand?

K. Executive Order 13158: Marine Protected Areas

1. E.O. 13158 Requirements

Executive Order 13158 has been established to ''help protect the significant natural and cultural resources within the marine environment for the benefit of present and future generations by strengthening and expanding the Nation's system of marine protected areas (MPAs).'' MPAs include areas of coastal and ocean waters, the Great Lakes and their connecting waters that have been reserved by laws or regulations to provide lasting protection for part or all of their natural resources. The list of MPAs defined for the purposes of this Executive Order will be published and maintained by the Secretary of Commerce and the Secretary of the Interior.

This order aims at further enhancing and strengthening protection of the existing MPAs and establishing new or expanded MPAs. The order provides EPA with the ability to propose new science-based regulations, as necessary, to ensure better protection for beaches, coasts, and the marine environment from pollution.

2. Impacts on Marine Resources

The proposed regulation is expected to enhance protection of MPAs by improving the quality of marine waters receiving discharges from MP&M facilities. Although the list of MPAs affected by this order has not yet been published, may include waterbodies currently protected under the National Estuaries Program (NEP), wildlife refugees, and other significant natural and cultural resources in marine environments. EPA compared sample MP&M facility discharge locations with the list of the 28 waterbodies under the NEP and the Chesapeake Bay to assess potential impacts of the regulation on significant marine resources. Sample MP&M facilities included in this analysis discharge directly or indirectly to 627 receiving waterways, of which, 544 are rivers/streams, 55 are bays or estuaries, and 28 are lakes, including the Great Lakes. This analysis showed that several of the NEP waterbodies currently receive discharges from the sample facilities, including Long Island Sound (NY/CT), Buzzards Bay (MA), Narragansett Bay (RI), and Puget Sound (WA). Most of the other protected estuaries receive effluents from the sample MP&M facilities via connecting waters. For example, discharges to the Connecticut River enter Long Island Sound (NY/CT), and discharges to the Hudson River enter the New York-New Jersey Harbor.

The absence of the current MPA list makes it difficult to determine the extent of benefits to MPAs from the proposed rule. The breadth of this regulation, however, ensures that some MPAs are likely to benefit from reduced pollutant discharges from MP&M facilities.

L. Coastal Zone Act Reauthorization Amendments (CZARA)

Congress enacted Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) in 1990 to address the problem of nonpoint source pollution in coastal waters. Section 6217 of CZARA requires all States/tribes with federally approved coastal zone management programs to develop and implement coastal nonpoint pollution control programs. The EPA and NOAA administer the Section 6217 program and have developed guidance to assist States in implementing the coastal nonpoint pollution control programs. States may choose the specific practice or combination of practices that will achieve the goals of controlling nonpoint source pollution and of protecting coastal waters.

Section 6217 of CZARA differs from the previous Coastal Zone Management Act (CZMA) of 1972 in that it is a mandatory program. Under CZMA the participation by States in coastal resource management was voluntary. CZARA requires coastal States/tribes to submit a coastal nonpoint pollution program to the EPA and NOAA within 30 months of the technical guidance issuance by EPA and NOAA (by July 1995).

The technical guidance provided by EPA and NOAA identifies five categories of nonpoint sources affecting coastal waters: Agriculture; forestry; urban runoff; marinas and recreational boating; and hydromodification. For each category, the technical guidance specifies management measures and practices to control nonpoint pollution. Management measures are defined in CZARA as economically achievable measures that reflect the best available technology to control the addition of pollutants to coastal waters.

Although today's proposed rule does not affect nonpoint sources directly, it may contribute to nonpoint source pollution control in coastal areas by improving the quality of sewage sludge. EPA estimates that 1.7 million dry metric tons of sewage sludge would be newly qualified for land application as a result of the proposed rule. Sewage sludge is a valuable source of fertilizer and can be applied to agricultural land, golf courses, sod farms, forests, and residential gardens. Compared to nitrogen in most chemical fertilizers, nitrogen in sewage sludge is relatively insoluble in water. If sewage sludge is used as a substitute for chemical fertilizers on agricultural land nonpoint source contamination of surface water can be reduced.

XXIII. Solicitation of Data and Comments

EPA invites and encourages public participation in this rulemaking. The Agency asks that comments address any perceived deficiencies in the record of this proposal and that suggested revisions or corrections be supported by data where possible. See Section XXIV for guidelines for submittal of data.

EPA particularly requests comments and information on the following issues:

1. Steel Forming & Finishing Facilities. EPA solicits comments on the choice to include the Steel Forming & Finishing facilities in today's proposed MP&M regulation. Facilities in this subcategory predominantly process steel wire, rod, bar, pipe, or tube. EPA previously regulated these sites under the 1982 Iron & Steel Manufacturing effluent guidelines (40 CFR part 420). However, based on the information gathered during the data collection effort for the Agency's proposed revision to the Iron & Steel Manufacturing regulations, EPA has determined that these facilities are more appropriately regulated by the MP&M proposed rule. (See Section VI.C.5 for a discussion of the proposed applicability of the Steel Forming & Finishing Subcategory). EPA is also interested in analytical sampling data to help better identify the raw wastewater characteristics and treatment performance of facilities in the proposed Steel Forming & Finishing subcategory. Please note the requirements for submitting paired influent and effluent data, as described in section XXIV.A.

In addition, for facilities that perform operations that fall within the proposed scope of both the MP&M Steel Forming & Finishing subcategory and the proposed Iron & Steel regulations (*i.e.,* a facility that performs manufacturing and batch electroplating of steel), EPA is soliciting comment on whether both regulations should cover these facilities (using the combined waste stream formula for indirect dischargers or building block approach for direct dischargers) or whether EPA should allow facilities that would fall under the scope of both regulations to be regulated only by the Iron & Steel Manufacturing rule. EPA notes that both the proposed regulations discussed here set mass-based limits for these facilities. If the Agency were to choose the later option, it would need to incorporate a wastewater flow allowance for the steel forming and finishing operations into the mass-based limits of the Iron & Steel regulation, where applicable. EPA is particularly interested in comments from permit writers and control authorities concerning the burden of permitting an Iron & Steel facility under two effluent guidelines (using the building block approach or combined waste stream formula) versus the expected complexity of interpreting the applicability statements when two regulations cover the same operations. In addition, EPA is interested in better understanding the potential economic advantage (or disadvantage) this might create between stand-alone steel forming & finishing facilities and steel manufacturing facilities where steel forming & finishing operations occur.

2. P2 Alternative for Metal Finishing Job Shops subcategory. EPA solicits comment on all aspects of the Pollution Prevention Alternative for the Metal Finishing Job Shops subcategory including the list of practices as well as the possible format for the alternative (see Section XXI.D for a discussion of the P2 Alternative). More specifically, EPA requests comment on whether there are additional or different practices that should be listed, the number of practices that should be required in each category, the reasons why any of the practices may not be applicable to specific facilities or processes, the costs of implementing this compliance alternative, the pollutant reduction associated with this alternative, and whether EPA should offer this alternative to direct discharging facilities in the Metal Finishing Job Shops subcategory, only to facilities discharging below a specified wastewater discharge flow, other subcategories such as General Metals (even those not currently regulated by the Metal Finishing and Electroplating effluent guidelines), or at certain facilities in other subcategories (*e.g.,* captive metal finishing and electroplating shops).

EPA also requests comment on whether the Agency should (if the P2 Alternative is incorporated in the final rule) require all facilities that choose the P2 Alternative to also meet the pretreatment standards for the Metal Finishing effluent guidelines (40 CFR part 433). That is, should facilities that are currently covered by the Electroplating effluent guidelines (40 CFR part 413) have to meet the pretreatment standards for the Metal Finishing effluent guidelines or for the Electroplating effluent guidelines when choosing to comply with the P2 Alternative in lieu of the MP&M pretreatment standards? EPA is interested in receiving information on the additional costs that would be incurred by facilities currently covered by the Electroplating effluent guidelines in order to meet the pretreatment standards of the Metal Finishing effluent guidelines.

3. Monitoring Flexibility—Monitoring Waiver for Pollutants Not Present. In an effort to reduce monitoring burden on facilities, EPA is proposing to allow MP&M indirect discharge facilities to apply for a waiver that will allow them to reduce their monitoring burden. In order for a facility to receive a monitoring waiver, the facility must submit a certification statement in writing to the control authority (*e.g.,* POTW) stating that the facility does not use, nor generate in any way, a pollutant (or pollutants) at their site and that the pollutant (or pollutants) is present only at background levels from intake water and without any increase in the pollutant due to activities of the discharger. The facility must base this certification on sampling data or other technical factors and is not a waiver from including the numerical limit in the control mechanism (*i.e.,* permit) (see Section XXI.C.1 for a discussion on this monitoring waiver). EPA solicits comment on the language proposed for the monitoring waiver for MP&M indirect dischargers. EPA is also interested in receiving comment on the Agency's estimate of burden related to preparing and filing such a certification and the reduction in monitoring burden and associated cost savings that a facility would expect (see section XXII.A. for a discussion on the estimated burden).

4. Monitoring Flexibility—Organic Pollutant Monitoring. As discussed in Section XXI.C, EPA is proposing to allow the use of Total Organic Carbon (TOC) as an indicator parameter for organic pollutants found in the wastewater discharges at MP&M facilities. The indicator is an alternative limit. If facilities do not wish to use TOC as an indicator, EPA is proposing two other alternatives. The second alternative allows facilities to monitor for a list of organic pollutants (*i.e.,* total organics parameter (TOP) list) and to meet a limit which would equate to the summation of all quantifiable values of the listed organic pollutants. In any case where the data for these pollutants indicated a level below the minimum level (*i.e.,* below quantitation), EPA used the minimum level for the specific pollutant in the summation of the total organics parameter limit. Facilities will only have to monitor for those TOP chemicals that are reasonably present. The third alternative allows facilities to develop and certify the implementation of an ''organic chemical management plan.''

EPA solicits comment on the three alternatives being proposed for reducing the burden associated with monitoring for organic pollutants. EPA specifically solicits comment on the use of TOC as an indicator pollutant for the broad spectrum of organic pollutants found in MP&M process wastewater and whether EPA should require facilities that are not using the Agency's selected BAT technology to demonstrate a correlation between removal of TOC and removal of organic pollutants in their MP&M process wastewater.

EPA also requests comment on whether the Agency should allow facilities to choose an indicator pollutant from a given set of choices (*e.g.,* COD, Oil & Grease (as HEM), TOC, Total Petroleum Hydrocarbons (as SGT-HEM), etc.) instead of specifying TOC as the only allowable indicator parameter. Facilities would be required to demonstrate that the reductions in the chosen indicator parameter are equivalent to the reduction in the organic constituents required by the limit that EPA is proposing for the ''Total Organics Parameter'' (TOP). EPA is also interested in receiving comment on the Agency's estimate of burden related to preparing an organic chemicals management plan and the reduction in monitoring burden and associated cost savings that a facility would expect in each of these suggested alternatives as compared to monitoring for the TOP list (see section XXII.A. for a discussion on the estimated burden).

5. Monitoring Flexibility—Total Sulfide Waiver. EPA is proposing to set numerical limitations on the discharge of Total Sulfide from facilities in the General Metals, Metal Finishing Job Shops, Printed Wiring Board, Steel Forming & Finishing, and Oily Waste subcategories. In an effort to reduce monitoring burden on indirect dischargers, EPA is considering to allow a waiver for the monitoring of total sulfide (even when present), at the discretion of the POTW, when a facility demonstrates that the sulfides will not generate acidic or corrosive conditions and will not create conditions that enhance opportunities for release of hydrogen sulfide gas in the sewer/interceptor collection system or at the receiving POTW or otherwise interfere with the operation of the POTW. EPA solicits comment on this alternative and the burden associated with demonstrating that it meets the specified conditions.

6. Oily Operations Wastewater. Facilities in the Oily Wastes subcategory must only discharge wastewater from one or more of the following MP&M unit operations: alkaline cleaning for oil removal, aqueous degreasing, corrosion preventive coating, floor cleaning, grinding, heat treating, impact deformation, machining, painting, pressure deformation, solvent degreasing, testing (*e.g.,* hydrostatic, dye penetrant, ultrasonic, magnetic flux), steam cleaning, and laundering. If they discharge wastewater from any of the above listed operations but also discharge wastewater from other MP&M operations, they do not meet the criteria of the Oily Wastes subcategory. Facilities in this subcategory are predominantly machine shops or maintenance and repair shops. Similarly, EPA is proposing to define the applicability of the Railroad Line Maintenance subcategory using the same set of ''oily'' unit operations with the addition of ''washing of final product'' at facilities that perform routine cleaning and light maintenance on railroad engines, cars, and car-wheel trucks and similar structures. EPA solicits comment on the list of ''oily'' unit operations and whether commenters prefer the use of a list of unit operations to define the applicability or a definition (related to low metals content of the wastewater). EPA also requests comment on whether there are additional MP&M unit operations that should be included in this list.

7. Possible Addition of Other Regulated Parameters. The list of parameters which EPA proposes to regulate under today's proposal are listed in the proposed codified rule that accompanies this preamble. EPA is soliciting comments and data on additional parameters that should be considered for regulation. There are two additional chemicals that EPA is considering for regulation under the MP&M rule: dithiocarbamates and carbon disulfide. Dithiocarbamates is a chemical structural group that refers to a set of chemicals, including sodium dimethyldithiocarbamate, that are used by facilities in the MP&M industry for treatment of chelated metals wastewater (often referred to as ''DTC''). It can also be used as a reducing agent. Carbon disulfide can be formed during chelation breaking and other treatment steps. Although these chemicals are not used in the MP&M processes, they can be used/generated by the treatment of MP&M wastewater and may cause environmental impacts. EPA is specifically interested in data on the treatment of dithiocarbamates and carbon disulfide (including treatment effectiveness, treatment costs, costs of contract hauling of these wastewater) and on the environmental impacts that these chemicals may pose to aquatic life, human health, and POTWs.

In addition, EPA solicits comment on proper management practices for using dithiocarbamates (DTC) at MP&M facilities. EPA also requests information on alternative chemicals (*e.g.,* hydrazine, sodium borohydride) or technologies for use in chelation breaking as reducing or precipitation agents and the associated costs and environmental impacts.

8. Possible Deletion of Regulated Parameters. The list of parameters which EPA proposes to regulate in today's proposal are listed in the proposed codified rule that accompanies this preamble. EPA is soliciting comments and data on parameters that should be deleted from consideration for regulation.

9. Additional Technology Data. The Agency solicits additional data on the use of ultrafiltration systems for the removal of oily wastes and organic pollutants and on microfiltration systems for the removal of metal pollutants and Total Suspended Solids (TSS) in relation to process wastewater in the MP&M category. The Agency is particularly interested in receiving data on: (1) Technology performance, including pollutant reduction/elimination; (2) economics, including initial capital investment, operation and maintenance costs, payback period, waste disposal savings, material input savings, and other savings; (3) overall energy use; (4) sludge generation, including metals recoverability and the ability of sludge to be recycled on or off-site; (5) waste oil generation, including oil recovery and the ability of the oil to be recycled on or off-site; (6) air quality impacts and emissions. In addition, as some technologies eliminate or reduce discharges to water, but not to other media, the Agency solicits comments on the environmental impacts and regulatory costs associated with each technology's impact on other environmental media. The Agency particularly welcomes comments on technology performance and cost from MP&M facilities currently using these systems and from technology vendors and developers.

10. Costs of Contract Hauling MP&M Wastewater and Sludge. EPA's cost model costs facilities to contract haul small volumes of process wastewater when the cost is estimated to be less than installing and operating a wastewater treatment system. EPA used data from the detailed surveys (see Section V for a discussion of the Detailed Surveys) to estimate costs associated with contract hauling MP&M process wastewater and wastewater treatment sludge. EPA solicits comment on the total cost of contract hauling small volumes of untreated MP&M process wastewater and how much those costs differ based on the type of wastewater (*i.e.,* oily wastewater, hexavalent chromium-bearing wastewater, concentrated metal-bearing wastewater, chelated wastewater). EPA also solicits comment on the cost to haul hazardous wastewater treatment sludge.

11. Ultrasonic Cleaning. EPA solicits comment on non-chemical cleaning methods, such as ultrasonic cleaning.

Prior to performing surface finishing operations, facilities must clean the metal surface to remove dirt, grit, grease or other surface contaminants that may interfere with the finish. Currently, the most common method for cleaning metal parts prior to surface finishing operations is using an alkaline cleaning bath, which may be followed by electrolytic cleaning and rinsing steps, and then an acid bath followed by another rinse step. Recently, some facilities have started to use ultrasonic cleaning (*i.e.,* the use of sound waves) to clean metal surfaces prior to electroplating (or other surface finishing operations). Ultrasonic cleaning generates a wastewater that does not contain acid or alkaline cleaning agents. EPA solicits data and information on ultrasonic cleaning including the capital and operation and maintenance costs, feasibility of this method versus more traditional methods, characterization of the wastewater generated, size of the ultrasonic cleaning unit, and the limitations on its use (*e.g.,* is it only available for parts of a certain size or shape?).

12. Mixed-Use Facility Definition and Determination. As discussed in Section III, EPA is proposing to cover MP&M process wastewater at mixed-use facilities (*i.e.,* any municipal, private, U.S. military or federal facility which contains both industrial and commercial/administrative buildings at which one or more industrial sites conduct operations within the facility's boundaries). However, unlike the typical industrial facility, such as an aircraft or electronic equipment manufacturing plant with one primary manufacturing activity, the majority of military installations are mixed-use facilities and more like municipalities with several small industries as well as other operations within their boundaries. EPA is proposing to allow wastewater generated at different sites within a mixed-use facility to be dealt with as separate discharges for the purpose of applying the appropriate low flow cutoff (when applicable). EPA is proposing to allow the control authority to use its discretion in determining which wastewater discharges can be considered separate discharges for the purposes of applying the appropriate low flow cutoff (when applicable). The determination would likely be based on the degree of proximity between industrial operations and a practical application of the requirements for applicable MP&M subcategories.

EPA seeks information from facilities (both military and non-military) that believe they would fall within this mixed-use facility category. In addition, EPA seeks comments on the choice to allow control authorities to make this determination and the factors for making such a decision as well as alternative ways to divide a mixed-use facility.

13. Subcategorization of Metal Finishing Job Shops. EPA is proposing to create a subcategory called ''Metal Finishing Job Shops.'' This subcategory would only include facilities that are job shops by definition (*i.e.,* they own less than 50 percent of the parts that they process on-site) and are performing one of the six identifying operations in the existing Metal Finishing and Electroplating effluent guidelines. As discussed in Section VI.A, EPA chose to subcategorize these facilities as separate from facilities in the General Metals subcategory (which includes captive metal finishing and electroplating shops) based on the variability of their wastewater and on economics. Although, the facilities in both subcategories are performing many of the same operations and require the same wastewater treatment technologies. EPA requests comment on whether to combine the Metal Finishing Job Shops subcategory with the General Metals subcategory (or a portion of the General Metals subcategory). This would also include combining the data sets from which EPA sets the numerical limits for the rule.

In addition, the Agency notes that today's proposal sets a low flow exclusion for the indirect dischargers in the General Metals subcategory to reduce permitting burden, but does not set a low flow exclusion for the Metal Finishing Job Shops subcategory, as those facilities already have permits under existing effluent guidelines (see sections II.D, VI.C, and XII for discussions on the low flow exclusion). However, EPA notes that the proposed limits and standards for the Metal Finishing Job Shops subcategory are somewhat less stringent than those being proposed for the General Metals subcategory. EPA solicits comment on whether the use of the low flow exclusion for indirect dischargers in the General Metals subcategory versus no exclusion for facilities in the Metal Finishing Job Shops subcategory would cause a shift away from the use of job shops or whether the difference in numeric limitations would prevent such a shift.

14. Printed Wiring Board Job Shops. EPA solicits comment on the best placement, in terms of subcategorization, for printed wiring board ''job shops.'' EPA has identified a small number of facilities that perform some steps in the printed wiring board manufacturing process. For example, a printed wiring board manufacturer may contract out the tin/lead soldering operations to a printed wiring board job shop. Such a facility never performs all the steps necessary for manufacturing printed wiring boards. EPA is proposing to include these facilities in the Metal Finishing Job Shops subcategory due to their similarity in economics (due to the ''job shop'' nature of their work). However, EPA is soliciting comment on whether it is more appropriate to include these printed wiring board job shops in the Printed Wiring Board subcategory. More specifically, EPA requests data on the characterization of the wastewater from printed wiring board job shops, the variability of their raw materials, and the variability of the wastewater they generate.

15. BMPs in Lieu of Numerical Limitations. EPA solicits comment on allowing MP&M facilities to demonstrate compliance through installation of well-operated and maintained treatment systems. For example, instead of meeting a cyanide limit, the facility would demonstrate and keep records of the installation and ongoing use of a well-operated and maintained cyanide destruction unit that monitors oxidation-reduction potential (ORP). EPA is particularly interested in comments on how to define ''well-operated and maintained'' and estimates of the burden (in labor hours and dollars) required to keep records sufficient for demonstrating compliance and prepare a related certification statement.

EPA also solicits comment from control and permitting authorities on whether such an approach would increase or decrease their burden related to determining compliance and by how much (in labor hours and dollars). Comments should account for maintaining certifications and conducting inspections. EPA also requests comment on whether such an approach would be protective of the environment.

16. Applicability to Facilities With Ancillary MP&M Operations. EPA solicits comment on the language used to define applicability in regards to facilities that are not manufacturing, maintaining or rebuilding metal parts, products or machines for use in the 18 industrial sectors and that only perform MP&M operations (*e.g.,* maintenance and repair of metal parts and machines) as ancillary activities. For example, as discussed in Section III, EPA does not intend for the MP&M proposal to include process wastewater discharges from an on-site machine or maintenance shop at a facility engaged in the

manufacture of organic chemicals when the facility operates that shop to maintain the equipment related to manufacturing their products (*i.e.,* organic chemicals). EPA solicits comment on the clarity of this statement and specifically requests comment on alternative language. For example, EPA could use the following language instead: ''facilities that perform on-site maintenance and repair of equipment used to produce a product or perform an operation (*e.g.,* manufacturing of organic chemicals) where the wastewater generated is already covered by effluent guidelines for another point source category (with the exception of the Metal Finishing or Electroplating effluent guidelines) are excluded from the applicability of the MP&M regulation.''

17. Non-Chromium Anodizing. EPA is proposing to exclude wastewater from indirect discharging non-chromium anodizing facilities (that also do not use dichromate sealants) from the MP&M categorical pretreatment standards. Such facilities would still need to comply with the pretreatment standards of the Metal Finishing (40 CFR part 433) effluent guidelines for their non-chromium anodizing wastewater and the general pretreatment standards at 40 CFR part 403. EPA is proposing limits for direct dischargers in this subcategory. EPA solicits comment on whether the applicable standards for indirect discharging non-chromium anodizers should be transferred from 40 CFR part 433 to the MP&M regulation in order to include all non-chromium anodizers under one regulation. Because today's proposal includes a monitoring waiver for pollutants that are not present (see section XXI.C.1 for a discussion on the monitoring waiver), the Agency believes that transferring the pretreatment standards for these facilities to the MP&M regulation would allow non-chromium anodizing indirect dischargers to reduce the number of parameters for which they have to monitor.

In addition, EPA solicits comment and data on the chromium content of sulfuric acid anodizing baths, anodizing dyes/sealants, and other wastewater from sulfuric acid anodizing. EPA is especially interested in data that provides measurement of hexavalent chromium separate from that of trivalent chromium or total chromium.

18. Cyanide Monitoring. EPA is proposing to allow facilities, in subcategories with limits and standards for cyanide, to also monitor for amenable cyanide when they have alkaline chlorination treatment in place prior to commingling their wastewater (see detailed discussion in section XXI.C.3). The point of compliance is based on monitoring for total cyanide (or amenable cyanide) directly after cyanide treatment, before combining the cyanide treated effluent with other wastestreams. EPA is also proposing an alternative where a facility may take samples of final effluent, in order to meet the total cyanide limit, if the control authority adjusts the permit limits based on the dilution ratio of the cyanide wastestream flow to the effluent flow. EPA is proposing to allow end-of-pipe alternative sampling point for amenable cyanide as well; however, in addition to adjusting the permit limits based on the dilution ratio, facilities must have alkaline chlorination treatment in place prior to the commingling of their cyanide-bearing wastewater with other process wastewater. The Agency notes this is very similar to the language used in the Metal Finishing effluent guidelines (40 CFR part 433). EPA solicits comment on this approach.

19. Compliance Cost for BAT Facilities. EPA has based the numeric limitations for today's proposed rule on wastewater sampling analytical data from facilities that the Agency believes to be operating ''best available technology.'' This includes pollution prevention and water conservation practices as well as wastewater treatment systems. However, because EPA uses more than one facility to determine the achievable long-term average concentrations and variability factors (see Section VIII.B for a discussion on calculation of limits), not all model facilities are achieving the long-term average concentrations for all pollutants in their wastewater at all times. Therefore, EPA has included compliance costs to enhance these model BAT facilities to meet the proposed long-term average concentrations for all regulated pollutants. For example, model BAT facilities may incur costs for additional operational controls or for additional equipment or chemical additives that will allow them to target more than one metal type in their wastewater treatment system. EPA solicits comment on this approach and the adequacy of operational changes and treatment enhancements for BAT facilities to consistently and reliably achieve full compliance with proposed limitations. EPA also solicits comment and data on additional costs that model BAT facilities may incur that EPA has not included in the cost model for this proposal.

20. Space Limitations. EPA solicits comment on the extent to which a MP&M facility can install or upgrade its current treatment system to meet the proposed limits within the space they currently occupy. More specifically, when facilities are located in urban areas with little space for expansion, can facilities still install the treatment necessary (consider the inclusion of pollution prevention and water conservation practices) to meet the proposed limits. If not, can such facilities use pollution prevention and water conservation practices and install microfiltration systems instead of installing or enlarging their existing clarifiers within the space they currently occupy?

21. Segregation of Waste Streams. EPA solicits comment and information on the problems/ issues with segregation of waste streams for performing preliminary treatment steps as described in section VIII. EPA is especially interested in data on the costs associated with retrofitting equipment to segregate waste streams.

22. Revision to POTW Removals. EPA uses the pollutant by pollutant percent removals achieved by POTWs (national average of well-operated POTWs with secondary treatment) to give credit to the pretreatment system and to conduct the ''Pass Through'' analysis for selecting regulated parameters for pretreatment standards.

In calculating the pollutant removals achieved by the selected technology option for today's proposed rule (for wastewater generated by indirect dischargers), EPA does not take ''credit'' for removing the portion of pollutant loadings that are currently removed by the POTWs. In addition, EPA performs a comparison of the percentage of a pollutant removed by POTWs with the percentage of the pollutant removed by discharging facilities applying EPA's selected technology option (BAT). In most cases, (particularly for metals and non-volatile organics) EPA has concluded that a pollutant passes through the POTW when the median percentage removed nationwide by representative POTWs (those meeting secondary treatment requirements) is less than the median percentage removed by facilities complying with BAT effluent limitations guidelines for that pollutant. EPA notes that the Pass Through Analysis uses a different standard for ''pass through'' than that used by POTWs to determine compliance with the General Pretreatment Standards (40 CFR part 403).

Recently, EPA has revisited the databases used (see Section XII.A for a discussion of the databases and the editing criteria used) to determine the

percent removal of pollutants achieved by the national average of well-operated POTWs. Previously, EPA edited data at or near the minimum level for POTW performance based on the editing criteria used to calculate BAT limitations. EPA is considering revising the POTW data editing criteria. Given the range of analytical minimum levels and their influence on calculated percent removals, EPA is considering several editing alternatives, detailed in section XIV. The Agency solicits comments on potential revisions to the pass-through methodology.

23. Toxic Weighting Factors. EPA has developed Toxic Weighting Factors (TWFs) using a combination of toxicity data on human health and aquatic life. EPA develops TWFs relative to the toxicity of copper. (See section XVII or the Cost-Effectiveness Analysis Document for this proposed rule for a more detailed discussion of toxic weighting factors). TWFs are multipliers that are applied to the mass of pollutants discharged (or removed) to generate toxic-weighted pound-equivalents. EPA uses toxic pound-equivalents to indicate the amount of toxicity that a pollutant may exert on human health and aquatic life relative to other pollutants. Conventional pollutants such as BOD, TSS, Oil & Grease (as HEM) and other bulk parameters do not have toxic weighting factors. As scientists and researchers develop and publish new human health and aquatic toxicity data for various pollutants, EPA must revise the TWFs. EPA has documented the changes to TWFs in the Cost-Effectiveness Analysis document for this proposed rule. EPA solicits comment on these changes.

24. Phosphoric Acid Cleaning. In regards to the applicability of the Oily Wastes subcategory, EPA is soliciting comment on the differences in metals content of wastewater generated from ''light'' phosphoric acid operations (such as some phosphoric acid etching operations and cleaning operations using phosphoric acid solutions) and from phosphate conversion coating. EPA is considering including phosphoric acid etching and cleaning using phosphoric acid solutions in the definition of ''oily operations'' discussed in section VI.C.6. However, the Agency is not considering the inclusion of phosphate conversion coating as one of the ''oily operations.'' Based on EPA's database for this proposal, EPA believes that wastewater generated from phosphate conversion coating operations contains high levels of zinc and manganese. EPA is especially interested in analytical data from sampling wastewater that is representative of either of these operations.

25. Organics Management Plan for Oily Wastes Subcategory. EPA solicits comment on whether sites with significant amounts of oil-bearing wastewater (for example, a facility in the Oily Wastes subcategory) should be eligible for the use of an organic pollutant management plan as described Section XXI.C.2. Based on the current data base, EPA believes that wastewater generated by facilities in the Oily Wastes subcategory require end-of-pipe treatment to reduce the concentrations of organic pollutants and that an organic management plan alone may not adequately control organic-bearing wastewater at facilities containing significant quantities of oil-bearing wastewater.

26. NSPS and PSNS Technology Option. EPA is proposing NSPS and PSNS for the General Metals, Metal Finishing Job Shops, Printed Wiring Board, and Steel Forming and Finishing subcategories based on BAT Option 4. This proposed option includes in-process flow control and pollution prevention, segregation of wastewater streams, preliminary treatment steps as necessary (including oils removal by ultrafiltration), chemical precipitation using lime or sodium hydroxide, and solids separation using a microfilter. The Agency also strongly considered proposing NSPS and PSNS for these subcategories based on ultrafiltration for oil and grease removal and chemical precipitation followed by sedimentation for TSS and metals removal. This option is equivalent to BAT Option 2 with the oil/water separator replaced by an ultrafilter. The Agency is soliciting comment and data on this option for NSPS and PSNS for the final rule.

27. Total Sulfide. EPA is soliciting comment on the appropriate analytical method for analyzing total sulfide in wastewater from MP&M facilities, specifically in regard to interferences from reducing agents or organic chemicals present in the wastewater. The Agency used EPA Method 376.1 for seven wastewater sampling episodes, EPA Method 376.2 at one episode, and Standard Method 4500–S2 for three sampling episodes that were performed for EPA by a local POTW. Stakeholders have suggested that presence of reducing agents and organic chemicals can interfere with EPA Method 376.1, leading to over estimates of total sulfide.

EPA performed matrix spike/matrix spike duplicate recoveries as part of its QA/QC procedures on these samples. If the matrix spike is recovered quantitatively (e.g., 75–125%), it is unlikely that an interference is present. The data narratives for these samples did not cite any QA/QC outliers. However, some interferences could still be present. (The data narratives can be found in section 5.2 of the public record.) EPA intends to perform additional sampling for total sulfide following this proposal using both EPA Method 376.1 and 376.2. EPA notes that it collected the data used for estimating total sulfide pollutant loadings in raw wastewater (i.e., in wastewater from MP&M unit operations) at sampling points located prior to treatment technologies which introduce reducing agents (i.e., chelation breaking). In addition, the data that EPA used to develop the numerical limitation for total sulfide was from a site that did not add reducing agents to treat its wastewater.

EPA solicits comment on the various sulfide methods and whether these methods are appropriate for analytical wastewater sampling at MP&M facilities. EPA also solicits raw wastewater and treatment performance data for total sulfide.

28. Limits for the Non-Chromium Anodizing Subcategory. EPA is soliciting comment on two issues relating to the proposed limitations for the Non-Chromium Anodizing subcategory. These two issues are discussed below.

EPA is proposing an effluent limitation for aluminum applicable to existing and new direct dischargers in the Non-Chromium Anodizing subcategory. Because EPA does not have data from any direct discharging non-chromium anodizers, it based the proposed aluminum limitation on two indirect discharging non-chromium anodizers. However, the Agency does not believe that these indirect discharging facilities were achieving effluent levels of aluminum that reflect BAT. Because aluminum assists in the flocculation of wastewater at POTWs prior to sedimentation, many POTWs do not set stringent pretreatment standards for aluminum from non-chromium anodizers. EPA is not proposing pretreatment standards for aluminum in today's proposal for that reason. In addition, neither the Electroplating (40 CFR part 413) nor the Metal Finishing (40 CFR part 433) effluent guidelines contain pretreatment standards for aluminum. Therefore, the Agency does not believe that these two facilities targeted aluminum in their wastewater treatment operations. EPA believes that a non-chromium anodizer employing Option 2 technologies can achieve effluent concentrations of aluminum much lower than those proposed today. Therefore, EPA is soliciting data and

comment on effective removal of aluminum from non-chromium anodizing wastestreams. See section XXIV for guidelines for submitting analytical data.

EPA is proposing effluent limitations for new and existing direct dischargers for manganese, nickel and zinc for facilities in the Non-Chromium Anodizing subcategory. The Agency based these effluent limitations on facilities in the General Metals subcategory employing the Option 2 treatment technology because it did not have adequate wastewater treatment information on these metals from non-chromium anodizing facilities. EPA solicits data and comment on the treatment of manganese, nickel, and zinc from non-chromium anodizing facilities employing Option 2 treatment. See section XXIV for guidelines for submitting analytical data.

29. Limits for the Printed Wiring Subcategory. EPA is proposing effluent limitations for chromium, copper, lead, and zinc for existing facilities in the Printed Wiring Boards subcategory. The Agency based these effluent limitations on facilities in the General Metals subcategory employing the Option 2 treatment technology because it did not have adequate wastewater treatment information on these metals from printed wiring board facilities employing Option 2 treatment. EPA solicits data and comment on the treatment of chromium, copper, lead, and zinc at printed wiring board facilities employing Option 2 treatment. See section XXIV for guidelines for submitting analytical data.

30. Cyanide Loadings and Removals. EPA solicits comment and data (at the point directly following cyanide destruction treatment) on achievable effluent concentrations of cyanide (or amenable cyanide) from MP&M facilities that are currently regulated under the Metal Finishing effluent guidelines (40 CFR part 433). EPA's Design & Cost Model for the MP&M rule estimates pollutant loadings for the industry before and after compliance with the proposed regulation. For the purposes of estimating baseline loadings (*i.e.,* current discharges) for model facilities (*i.e.,* survey sites) currently covered by the Metal Finishing or Electroplating effluent guidelines that indicated in their survey questionnaire that they both generate wastewater from cyanide-bearing operations and have cyanide treatment in place, EPA assumed that these sites were achieving the LTA concentrations achieved by EPA's sampled MP&M BAT facilities (sampled at the point directly following cyanide destruction treatment).

For model sites currently covered by the Metal Finishing or Electroplating effluent guidelines that indicated in their survey questionnaire that they generate wastewater from cyanide-bearing operations but *did not* indicate that they have cyanide treatment in place, EPA used information from EPA sampling of cyanide bearing units operations (i.e., raw wastewater loads) to estimate baseline loads prior to implementing the technology option under consideration (note that cyanide loadings were not analyzed separately by subcategory). On a national basis, EPA estimates that 65% (2,315) of MP&M facilities discharging cyanide-bearing wastewater do not have treatment in place for cyanide destruction. EPA based this national estimate on responses to survey questionnaires. This methodology implicitly assumes that many of these facilities may not be achieving the cyanide removals that were projected for the Metal Finishing and Electroplating effluent guidelines. In addition to the request for data above, EPA also requests comment on its method for determining baseline cyanide loadings. (See Section 6.5 of the public record for a memorandum that includes a table of the comparison of cyanide using sites versus cyanide treating sites.)

31. Subcategorization. EPA explains its rationale for its proposed subcategorization scheme in section VI. EPA is proposing to subdivide the MP&M industrial category into the following 8 subcategories: General Metals, Metal Finishing Job Shops, Non-Chromium Anodizing, Printed Wiring Boards, Steel Forming and Finishing, Oily Wastes, Railroad Line Maintenance, and Shipbuilding Dry Dock. The Agency believes its proposed subcategories make sense, but requests comment on other possible subcategories. Commenters should include data to support their suggestions where possible.

32. Cost Savings Associated with Pollution Prevention and Water Conservation. As discussed in section VIII, EPA's proposed technology options include the incorporation of water conservation techniques and pollution prevention technologies. In all cases, EPA's options that incorporated these technologies and practices costed less and removed more pollutants than those options that did not. EPA requests comment on its determination that pollution prevention, recycle, and water conservation result in net cost savings to facilities, and examples of any specific situations where this may not be true.

33. Assessment of Treatment System Performance. As discussed in section VIII, EPA excluded data from chemical precipitation and clarification systems at which the concentration of most of the metals present in the influent stream did not decrease, indicating poor treatment. Although EPA believes this is an appropriate practice, in order to focus on facilities with well-run treatment systems, it also introduces a risk of biasing estimates of treatment effectiveness upwards with respect to identifying pollutant removals on a national basis. If a particular metal is not able to be effectively removed by a particular treatment train, but its concentration fluctuates randomly over time in both the influent and the effluent, then retaining only data showing positive ''removals'' may give a misleading impression of effectiveness of that treatment technology nationally. Some commenters have raised this issue in the past particularly with respect to boron, which those commenters believe is not effectively removed by certain treatment trains where EPA's data (edited to include only decreases) appears to show removals. EPA is continuing to assess this concern both with regards to metals in general and with regards to boron in particular. EPA requests comment on this issue and suggestions for addressing it.

34. Flow Cutoff Level for the General Metals Subcategory. As explained in sections XII and XIII, EPA is proposing a 1 MGY flow cutoff for existing and new indirect discharging facilities in the General Metals subcategory. EPA requests comment on the 1 MGY flow cutoff and whether a higher or lower cutoff would be appropriate. EPA also requests comment on whether the flow cutoff should be different for facilities currently covered under 40 CFR Part 413 or 433 and whether or not that would create an unfair economic advantage for those facilities (e.g., captive electroplating shops in General Metals remaining regulated under 40 CFR Part 433 but Metal Finishing Job Shops being regulated under the proposed MP&M rule).

35. Flow Cutoff Level for the Metal Finishing Job Shops Subcategory. As explained in sections XII and XIII, EPA is not proposing a flow cutoff for existing or new indirect discharging facilities in the Metal Finishing Job Shops subcategory. The Agency concluded that the pollutant reductions associated with the proposed option (Option 2) were feasible and achievable and the economic impacts were not substantially mitigated under the 1 MGY flow cutoff. EPA requests

comment on the use of a flow cutoff for this subcategory.

36. Flow Cutoff Level for the Printed Wiring Board Subcategory. As explained in sections XII and XIII, EPA is not proposing a flow cutoff for existing or new indirect discharging facilities in the Printed Wiring Board subcategory. The Agency concluded that the pollutant reductions associated with the proposed option (Option 2) were feasible and achievable and the economic impacts were not mitigated at a 1 MGY flow cutoff for this subcategory. The Agency solicits comments on a 1 MGY flow cutoff. Under this scenario, existing regulation would continue to apply. EPA solicits comment on the implementation and market consequences of this option.

37. Flow Cutoff Level for the Steel Forming and Finishing Subcategory. As explained in sections XII and XIII, EPA is not proposing a flow cutoff for existing or new indirect discharging facilities in the Steel Forming and Finishing subcategory. However, EPA solicits comment on flow cutoffs at the 1, 2, and 3 MGY levels. Under these flow cutoff scenarios, existing regulations would continue to apply. EPA solicits comment on implementation and market consequences of these options.

38. Flow Cutoff Level for the Oily Wastes Subcategory. As explained in sections XII and XIII, EPA is proposing a 2 MGY flow cutoff for existing and new indirect discharging facilities in the Oily Wastes subcategory. It is proposing the 2 MGY flow cutoff primarily to reduce the burden on POTWs, and solicits comment on a 3 MGY cutoff.

39. For the General Metals, Metal Finishing Job Shops, Printed Wiring Boards, and Steel Forming and Finishing subcategories, EPA is proposing new source performance standards and pretreatment standards for new sources based on Option 4. EPA noted in section IX in the discussion of its consideration of this technology for BPT/BAT for each of these subcategories that it is not being proposed for BPT because the additional removals, while large when considered across the entire population of existing facilities, were not significant on a per facility basis, and because of concerns with potential increased loadings (relative to Option 2) of COD and organic pollutants. EPA requests comment on basing NSPS on Option 2 for the above subcategories for the same reasons it is proposing to base BPT/BAT on Option 2.

40. Monitoring Costs. In estimating annual monitoring costs for model facilities in EPA's MP&M Design and Cost Model, the Agency assumed that facilities meeting local limitations or national effluent limitation guidelines and pretreatment standards will already incur monitoring costs. EPA solicits comment on whether the facilities will incur additional monitoring costs to comply with today's proposal (and how much that monitoring would cost). EPA has incorporated several options for adding additional flexibility in regards to monitoring (See Section XXI.C for a discussion on monitoring flexibility). EPA expects that these proposed flexibilities will decrease the overall burden and costs of analytical wastewater monitoring for facilities within the scope of this rule.

41. Cash Flow Assumption. As discussed in Section XVI, baseline cash flow is defined as the sum of reported net income and depreciation. The measure is widely used within industry in evaluating capital investment decisions because both net income and depreciation (which is an accounting offset against income, but not an actual cash expenditure) are potentially available to finance future investment. However, assuming that total baseline cash flow is available over an extended time horizon (for example, 15 years) to finance investments related to environmental compliance could overstate a site's ability to comply. In particular, the cost of existing capital equipment (not associated with regulatory compliance) is not netted out of cash flow, as it is of income through the subtraction of depreciation. Thus, any costs associated with either replacing existing capital equipment, or repaying money that was previously borrowed to pay for it, are omitted from the facility analysis. EPA requests comment on its use of cash flow as a measure of resources available to finance environmental compliance and suggestions for alternative methodologies. (See Section XXII of today's notice.)

42. Alternatives for Establishing Permit Effluent Limitations and Standards for the Steel Forming and Finishing subcategory. As discussed in Section XXI.B, EPA is soliciting comment on several alternative approaches for the development of mass-based limitations for the Steel Forming and Finishing subcategory. These approaches may result in more stringent mass-based permits/control mechanisms for some facilities with better protection of the environment for the entire life of a permit/control mechanism and may result in higher costs. Each alternative requires that production from unit operations that do not generate or discharge process wastewater shall not be included in the calculation of operating rates. EPA solicits comments on these alternatives to the proposed production basis for calculating effluent limitations and pretreatment standards used in NPDES permits or control mechanisms. In particular, the Agency solicits comments on related costs and any technical difficulties that steel forming and finishing facilities might have in meeting limits during short periods of high production. EPA also solicits other options for consideration including whether to allow concentration-based limits for this subcategory and any rationale for doing so.

43. Benefit Analysis. As explained in Section XX, benefits analyses for past effluent guidelines have been limited in the range of benefits addressed which has hindered EPA's ability to compare the benefits and costs of rules comprehensively. The Agency is working to improve its benefits analyses, including applying methodologies that have now become well established in the natural resources valuation field, but have not been used previously in the effluent guidelines program. EPA was particularly interested in expanding its benefits analysis for this rule to include water-based recreational activities other than fishing. EPA has therefore expanded upon its traditional methodologies in the benefits analysis for the proposed MP&M rule. Past effluent guidelines analyses have included human health benefits, economic productivity benefits such as reduced costs for POTW sludge disposal, recreational benefits for fishing, and nonuse values. The additional analysis contained in this rule expands on the traditional analysis by adding benefits to participants in boating, swimming, and viewing (i.e., near-water recreation). Because EPA has not yet resolved some anomalies in the extrapolation of the analysis to the national level, the monetized benefits for these new categories are not included in the summary statements of benefits for the proposed rule. However, EPA is including these analyses in the EEBA to present the new methodologies and their results as applied to the MP&M rule for public comment.

Although EPA is confident in the sample-based results, EPA believes that the large number of viewers and boaters projected to benefit from the rule at the national level may indicate a need to revise its procedures for scaling up from sampled facilities to the national level. This simple extrapolation technique used in both the cost and benefit analyses may bias both estimates and may have the unintended effect of overcounting the number of benefitting

boaters and wildlife viewers. EPA recognizes that extrapolating from sample facility to national results introduces uncertainty in the analysis and is continuing to explore ways to reduce this uncertainty. The Agency is requesting comment on the methods used to extrapolate sample results to national benefit estimates. EPA is also specifically soliciting comment on several of the other methodological approaches used in the new analysis including the benefits transfer of values from studies that did not specifically address boating and wildlife viewing to these activities, and the extent to which activities such as recreational boating and wildlife viewing are applicable to children. EPA may include additional categories of monetized benefits estimates based on these new methodologies, as revised based on comment and peer review, in its economic analysis for the final rule.

XXIV. Guidelines for Submission of Analytical Data

EPA requests that commenters to today's proposed rule submit analytical, flow, and production data to supplement data collected by the Agency during the regulatory development process. To ensure that commenter data may be effectively evaluated by the Agency, EPA has developed the following guidelines for submission of data.

A. Types of Data Requested

1. EPA requests paired influent and effluent treatment data for each of the technologies identified in the technology options (especially in cases where paired data will be helpful in assessing variability), as well as any additional technologies applicable to the treatment of MP&M wastewater. This includes end-of-pipe treatment technologies and in-process treatment, recycling, water reuse, or metal recovery technologies. Submission of effluent data only is not sufficient for full analysis; the corresponding influent data must be provided.

For submissions of paired influent and effluent treatment data, a minimum of four days of data are required for EPA to assess variability. Submissions of paired influent and effluent treatment data should include: a process diagram of the treatment system; treatment chemical addition rates; sampling point locations; sample collection dates; influent and effluent flow rates for each treatment unit during the sampling period; sludge or waste oil generation rates; a brief discussion of the treatment technology sampled; and a list of unit operations contributing to the sampled wastestream. EPA requests data for systems that are treating only process wastewater. Systems treating non-process wastewater (e.g., sanitary wastewater or non-contact cooling water) will not be evaluated by EPA. In addition to data for the analytes discussed below, data for total suspended solids (TSS) and pH must be included with submissions of treatment data. If available, information on capital cost, annual (operation and maintenance) cost, and treatment capacity should be included for each treatment unit within the system.

2. EPA also requests flow, production, and analytical data from MP&M unit operations, rinses, and wet air pollution control devices. Submissions of analytical data for MP&M unit operations and rinses should include a process diagram of the unit operation; a description of the purpose and performance of the operation; production data associated with the sampling period; flow rates associated with the sampling period (i.e., continuous discharge flow rates, intermittent discharge rates and frequencies, or volume of bath and time of last discharge for stagnant baths); sample type (grab or composite); temperature and pH of each sample; sample collection dates; known process bath constituents; sampling point locations; and, the volume, discharge frequency, and destination of all process wastewater, waste oil, or sludge generated by the unit operation.

Associated production data should be provided in the following units: mass of metal removed (for abrasive jet machining, electrical discharge machining, grinding, machining, and plasma arc machining operations), in standard cubic feet of air flow (for wet air pollution control operations), or surface area of parts processed (for all other unit operations). Flow, production, and analytical data should all correspond to the same period of time. When applicable, a description of any pollution prevention technologies used at the site for the unit operations, including cost savings and pollution reduction estimates should be provided.

B. Analytes Requested

EPA considered metal, organic, conventional, and other nonconventional pollutant parameters for regulation under the MP&M Category. Based on analytical data collected, the Agency initially identified 132 pollutant parameters as MP&M ''pollutants of concern.'' Complete lists of pollutant parameters considered for regulation and pollutants of concern (as well as the criteria used to identify each of these pollutant parameters) are briefly discussed in Section VII and fully discussed the Technical Development Document for this proposal. The Agency requests analytical data for any of the 132 pollutants of concern and for any other pollutant parameters which commentors believe are of concern in the MP&M industry. TSS and pH data are requested for all samples. Table XXIV–1 presents the EPA analytical methods for these pollutants. Commentors should use these methods or equivalent methods for analyses, and should document the method used for all data submissions.

C. Quality Assurance/Quality Control (QA/QC) Requirements

EPA based today's proposed regulations on analytical data collected by EPA using rigorous QA/QC checks. These QA/QC checks include procedures specified in each of the analytical methods, as well as procedures used for the MP&M sampling program in accordance with EPA sampling and analysis protocols. The Agency requests that submissions of analytical data include documentation of QA/QC procedures.

EPA followed the QA/QC procedures specified in the analytical methods listed in Table XXIV–1. These QA/QC procedures include sample preservation and the use of method blanks, matrix spikes, matrix spike duplicates, laboratory duplicate samples, and Q standard checks (*e.g.,* continuing calibration blanks). EPA requests that sites provide detection limits for all non-detected pollutants. EPA also requests that composite samples be collected for all flowing wastewater streams (except for analyses requiring grab samples, such as oil and grease), sites collect and analyze 10 percent field duplicate samples to assess sampling variability, and sites provide data for equipment blanks for volatile organic pollutants when automatic compositors are used to collect samples.

TABLE XXIV–1.—EPA ANALYTICAL METHODS FOR USE WITH MP&M

Parameter	EPA method
Acidity	305.1
Alkalinity	310.1
Ammonia as Nitrogen	350.1
BOD 5-Day (Carbonaceous)	405.1
Chemical Oxygen Demand (COD)	410.1
	410.2
Chloride	325.3
Cyanide, Total	335.2
Cyanide, Amenable	335.1
Fluoride	340.2
Metals	1620

TABLE XXIV–1.—EPA ANALYTICAL METHODS FOR USE WITH MP&M—Continued

Parameter	EPA method
Volatile Organics	1624
Semivolatile Organics	1625
Nitrogen, Total Kjeldahl	351.2
Oil and Grease	413.2
Oil and Grease (as HEM)	1664
pH	150.1
Phenolics, Total Recoverable	420.2
Phosphorus, Total	365.4
Sulfate	375.4
Sulfide, Total	376.2
Total Dissolved Solids (TDS)	160.1
Total Organic Carbon (TOC)	415.1
Total Petroleum Hydrocarbons (as SGT–HEM)	1664
Total Suspended Solids (TSS)	160.2
Weak-Acid Dissociable Cyanide	1677
Ziram	630.1

Appendix A to the Preamble—Abbreviations, Acronyms, and Other Terms Used in This Document

Act—The Clean Water Act
Agency—U.S. Environmental Protection Agency
AWQC—Ambient Water Quality Criteria
BAT—Best available technology economically achievable, as defined by section 304(b)(2)(B) of the Act.
BCT—Best conventional pollutant control technology, as defined by section 304(b)(4) of the Act.
BMP—Best management practices, as defined by section 304(e) of the Act.
BPT—Best practicable control technology currently available, as defined by section 304(b)(1) of the Act.
CAA—Clean Air Act (42 U.S.C. 7401 *et. seq.,* as amended)
CBI—Confidential Business Information
Clean Water Act—(33 U.S.C 1251 *et. seq.,* as amended)
Conventional Pollutants—Constituents of wastewater as determined by section 304(a)(4) of the Act and the regulations thereunder 40 CFR 401.16, including pollutants classified as biochemical oxygen demand, suspended solids, oil and grease, fecal coliform, and pH.
CE—Cost Effectiveness
DAF—Dissolved Air Flotation
Direct Discharger—An industrial discharger that introduces wastewater to a water of the United States with or without treatment by the discharger.
EEA—Economic and Environmental Impact Assessment of the Proposed Effluent Limitations Guidelines and Standards for the Metal Products & Machinery Industry. This document presents the methodology employed to assess economic and environmental impacts of the proposed rule and the results of the analysis.
Effluent Limitation—A maximum amount, per unit of time, production, volume or other unit, of each specific constituent of the effluent from an existing point source that is subject to limitation. Effluent limitations may be expressed as a mass loading or as a concentration in milligrams of pollutant per liter discharged.
End-of-Pipe Treatment—Refers to those processes that treat a plant waste stream for pollutant removal prior to discharge.
FTE—Full Time Equivalents (related to the number of employees)
HAP—Hazardous Air Pollutant
HEM—Hexane Extractable Material refers to an analytical method (EPA Method 1664) for determining the level of oil and grease that does not use Freon extraction.
Indirect Discharger—An industrial discharger that introduces wastewater into a publicly owned treatment works.
MP&M—Metal Products and Machinery point source category
NCEPI—EPA's National Center for Environmental Publications
NESHAP—National Emission Standards for Hazardous Air Pollutants
NRMRL—EPA's National Risk Management Research Laboratory (formerly RREL—EPA's Risk Reduction Engineering Laboratory).
MACT—Maximum Achievable Control Technology (applicable to NESHAPs)
Nonconventional Pollutants—Pollutants that have not been designated as either conventional pollutants or priority pollutants.
NPDES—National Pollutant Discharge Elimination system, a Federal Program requiring industry dischargers, including municipalities, to obtain permits to discharge pollutants to the nation's water, under section 402 of the Act.
OCPSF—Organic chemicals, plastics, and synthetic fibers manufacturing point source category (40 CFR part 414).
ORP—Oxidation-Reduction Potential
POTW—Publicly owned treatment works.
Priority Pollutants—The 126 pollutants listed in 40 CFR part 423, appendix A.
PPA—Pollutant Prevention Act of 1990 (42 U.S.C. 13101 *et seq.,* Pub. L. 101–508, November 5, 1990)
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 sections 307 (b) and (c) of the Act.
SIC—Standards Industrial Classification, a numerical categorization scheme used by the U.S. Department of Commerce to denote segments of industry.
SGP—EPA's National Metal Finishing Strategic Goals Program.
SGT–HEM—Silica Gel Treated—Hexane Extractable Material refers to the freon-free oil and grease method (EPA Method 1664) used to measure the portion of oil and grease that is similar to total petroleum hydrocarbons.
SIU—Significant Industrial User as defined in the General Pretreatment Regulations (40 CFR part 403)
Technical Development Document (TDD)—Development Document for Effluent Limitations Guidelines and Standards for the Metal Products and Machinery Point Source Category.
TOC—Total Organic Carbon (EPA method 415.1)
TOP—Total Organics Parameter
TRI—Toxic Release Inventory
TTO—Total Toxic Organics as defined in the Metal Finishing effluent guidelines (40 CFR part 433).
TWF—Toxic Weighting Factor
VOC—Volatile Organic Compound

List of Subjects

40 CFR Part 413

Environmental protection, Electroplating, Metals, Reporting and recordkeeping requirements, Waste treatment and disposal, Water pollution control.

40 CFR Part 433

Environmental protection, Metals, Reporting and recordkeeping requirements, Waste treatment and disposal, Water pollution control.

40 CFR Part 438

Environmental protection, Metals, Waste treatment and disposal, Water pollution control.

40 CFR Part 463

Environmental protection, Plastics materials and synthetics, Waste treatment and disposal, Water pollution control.

40 CFR Part 464

Environmental protection, Metals, Waste treatment and disposal, Water pollution control.

40 CFR Part 467

Environmental protection, Aluminum, Reporting and recordkeeping requirements, Waste treatment and disposal, Water pollution control.

40 CFR Part 471

Environmental protection, Metals, Waste treatment and disposal, Water pollution control.

Dated: October 31, 2000.

Carol M. Browner,

Administrator.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is proposed to be amended as follows:

PART 413—ELECTROPLATING POINT SOURCE CATEGORY

1. The authority citation for Part 413 is revised to read as follows:

Authority: 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342, and 1361.

2. Section 413.01 is amended by revising the first and last sentence of paragraph (a) to read as follows:

§ 413.01 Applicability and compliance dates.

(a) As defined more specifically in each subpart, this part applies to discharges resulting from electroplating operations in which a metal is electroplated on any basis material and to related metal finishing operations as set forth in the various subparts, whether such operations are conducted in conjunction with electroplating, independently, or as part of some other operation. * * * This part does not apply to any facility that must achieve the standards or limitations in 40 CFR 433.15 (Metal Finishing PSES) or 40 CFR part 438 (Metal Products & Machinery).

* * * * *

PART 433—METAL FINISHING POINT SOURCE CATEGORY

3. The authority citation for Part 433 is revised to read as follows:

Authority: 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342, and 1361.

4. Section 433.10 is amended by revising paragraph (b) to read as follows:

§ 433.10 Applicability; description of the metal finishing point source category.

* * * * *

(b) In some cases, effluent limitations and standards for other industrial categories may be applicable to wastewater discharges from the metal finishing operations listed in paragraph (a) of this section. In such cases, the effluent limitations and standards for this part do not apply and the metal finishing operations are subject to the provisions of one of the following categories:

Iron and Steel (40 CFR part 420);
Nonferrous Metals Smelting and Refining (40 CFR part 421);
Metal Products and Machinery (40 CFR part 438);
Battery Manufacturing (40 CFR part 461);
Plastic Molding and Forming (40 CFR part 463);
Metal Casting Foundries (40 CFR part 464);
Coil Coating (40 CFR part 465);
Porcelain Enameling (40 CFR part 466);
Aluminum Forming (40 CFR part 467);
Copper Forming (40 CFR part 468);
Electrical and Electronic Components (40 CFR part 469); and
Nonferrous Metals Forming (40 CFR part 471).

* * * * *

5. A new part 438 is proposed to be added to read as follows:

PART 438—METAL PRODUCTS AND MACHINERY POINT SOURCE CATEGORY

Sec.

Authority: 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342 and 1361.

§ 438.1 General applicability.

(a)(1) As defined more specifically in each subpart, except as provided in paragraphs (b), (c), (d), (e), (f), and (g) of this section, this part applies to process wastewater discharges from existing or new industrial sites (including facilities owned and operated by federal, state, or local governments) engaged in manufacturing, rebuilding, or maintenance of metal parts, products or machines for use in the Metal Product & Machinery (MP&M) industrial sectors listed in this section. A list of typical products found in each of the 18 industrial sectors is provided in Appendix A to this part. The MP&M Industrial Sectors consist of the following:

Aerospace;
Aircraft;
Bus and Truck;
Electronic Equipment;
Hardware;
Household Equipment;
Instruments;
Job Shops;
Mobile Industrial Equipment;
Motor Vehicle;
Office Machine;
Ordnance;
Precious Metals and Jewelry;
Printed Wiring Boards;
Railroad;
Ships and Boats;
Stationary Industrial Equipment; or
Miscellaneous Metal Products.

(2) This part also applies to mixed-use facilities, as described in paragraph (h) of this section.

(b) The regulations in this part do not apply to wastewater discharges which are subject to the limitations and standards of one or more of the following categories:

(1) Iron and steel manufacturing (40 CFR part 420).
(2) Nonferrous metals manufacturing (40 CFR part 421).
(3) Ferroalloy manufacturing (40 CFR part 424).
(4) Battery manufacturing (40 CFR part 461).
(5) Plastic molding and forming (40 CFR part 463).
(6) Metal molding and casting (40 CFR part 464).
(7) Coil coating (40 CFR part 465).
(8) Porcelain enameling (40 CFR part 466).
(9) Aluminum forming (40 CFR part 467).
(10) Copper forming (40 CFR part 468).
(11) Electrical and electronic components (40 CFR part 469).
(12) Nonferrous metals forming and metal powders (40 CFR part 271).

(c) When a facility discharges process wastewater that is subject to the general applicability of this part and the facility discharges other wastewater that is subject to the limitations and standards of one or more of the categories listed in paragraph (b) of this section, the facility must comply with both the provisions of this part and other parts, as applicable.

(d) Facilities other than those reasonably included in the 18 MP&M industrial sectors specified in paragraph (a) of this section are not subject to this part when discharges from the maintenance or repair of metal parts or machines at the facility are performed only as ancillary activities.

(e) Wastewater discharges generated from electroplating during semi-conductor wafer manufacturing in a ''clean room'' environment are not subject to this part. Wastewater discharges from electroplating during semiconductor final wafer assembly are subject to this part.

(f) Wastewater discharges resulting from the washing of cars, aircraft or other vehicles, when performed as a preparatory step prior to one or more successive manufacturing, rebuilding, or maintenance operations, are subject to this part.

(g) Process wastewater generated by maintenance and repair activities at gasoline service stations, passenger car rental facilities, or utility trailer and recreational vehicle rental facilities are not subject to this part.

(h) When this part is applied to wastewater discharges generated at different industrial sites (industrial buildings as well as outdoor locations where manufacturing, rebuilding, or maintenance occur as specified in § 438.1) within a mixed-use facility (as defined in § 438.2(c)), the control authority may consider these discharges to be separate for the purpose of applying the applicable low flow exemption to a pretreatment standard. The control authority must determine which wastewater discharges can be considered separate for this purpose.

§ 438.2 General definitions.

As used in this part:

(a) The general definitions and abbreviations in 40 CFR part 401 shall apply.

(b) The regulated parameters are listed with approved methods of analysis in Table 1B at 40 CFR 136.3, and are defined as follows:

(1) BOD_5 means 5-day biochemical oxygen demand.

(2) *Cadmium* means total cadmium.

(3) *Chromium* means total chromium.

(4) *Copper* means total copper.

(5) *Cyanide (T)* means total cyanide.

(6) *Cyanide (A)* means those cyanides which are amenable to alkaline chlorination.

(7) *Lead* means total lead.

(8) *Manganese* means total manganese.

(9) *Molybdenum* means total molybdenum.

(10) *Nickel* means total nickel.

(11) *O&G (as HEM)* means total recoverable oil and grease as hexane extractable material.

(12) *Silver* means total silver.

(13) *Sulfide (as S)* means total sulfide.

(14) *Tin* means total tin.

(15) *TSS* means total suspended solids.

(16) *Zinc* means total zinc.

(c) *Mixed-Use Facility* means any privately-owned or state, local, or federal government-owned facility which contains both industrial and commercial/administrative buildings (such as military bases and airports) at which one or more industrial sites conduct operations (including at least one that discharges wastewater subject to this part) within the facility's boundaries.

(d) *Non-process wastewater* means sanitary wastewater, non-contact cooling water, and storm water. In relation to a mixed-use facility, as defined in this part, non-process wastewater for this part also includes wastewater discharges from non-industrial sources such as residential housing, schools, churches, recreational parks, shopping centers as well as wastewater discharges from gas stations, utility plants, hospitals, and similar sources.

(e) *Process wastewater* means wastewater as defined in 40 CFR parts 122 and 401, and includes wastewater from non-contact, nondestructive testing (*e.g.,* photographic wastewater from nondestructive X-ray examination of parts) performed at facilities subject to this part and includes wastewater from air pollution control devices.

(f) *TOP (total organics parameter)* means a parameter which is calculated as the sum of all quantifiable concentration values greater than the nominal quantitation value of the organic pollutants listed in the Appendix B to this part. These organic chemicals are defined as parameters at 40 CFR 136.3 in Table 1C, which also cites the approved methods of analysis

or have procedures that have been validated as attachments to EPA Methods 1624/624 or 1625/625.

(g) *TOC (as indicator)* means total organic carbon used as an indicator for the organic pollutants listed in the Appendix B to this part.

§ 438.3 General pretreatment standards.

Any source subject to this part that introduces process wastewater pollutants into a publicly owned treatment works (POTW) must comply with 40 CFR part 403.

§ 438.4 Monitoring requirements.

(a) *Monitoring options.* All subcategories with limitations or standards for the TOP or TOC (as indicator) parameters must choose one of three monitoring options:

(1) Achieve the limitation or standard specified for the TOP parameter;

(2) Achieve a limitation or standard specified for the TOC (as indicator) parameter; or

(3) Develop and certify the implementation of a management plan for organic chemicals.

(b) *Management plan for organic chemicals.* (1) The management plan for organic chemicals must specify to the satisfaction of the permitting authority (or the control authority for discharges to a POTW) all organic chemicals that are in use at the facility; the method(s) used for disposal of these chemicals; the procedures in place for ensuring that organic chemicals do not routinely spill or leak into the wastewater, or that reduce to a minimum the amount of organic chemicals that are used in the process; the procedures in place to manage the oxidation-reduction potential (ORP) of process wastewater during cyanide destruction to control the formation of chlorinated organic by-products; and the procedures employed to prevent an excessive dosage of dithiocarbamates when treating wastewater containing chelated metals. Facilities choosing to develop a management plan for organic chemicals must certify that the procedures described in the plan are being implemented at the facility. A mixed-use facility, as defined in § 438.2(c), may develop, certify, and implement one or more management plans for organic chemicals when multiple industrial sites are subject to this part within their facility boundaries.

(2) In lieu of monitoring for individual organic chemicals specified collectively as TOP in Appendix B of this part or in lieu of monitoring for TOC (as an indicator), the permitting authority (or the control authority for dischargers to a POTW) may allow dischargers to make the following certification: ''Based on my inquiry of the person or persons directly responsible for managing compliance with the provisions of the Metal Products and Machinery regulation, I certify that, to the best of my knowledge, this facility is implementing the management plan for organic chemicals which was submitted to the permitting (or control) authority.'' For dischargers to surface waters, this statement is to be included as a comment on the Discharge Monitoring Report (DMR) required by 40 CFR 122.44(i). For indirect dischargers, the statement is to be included as a comment to the periodic reports required by 40 CFR 403.12(e).

(c) *TOP monitoring.* In monitoring to measure compliance with the TOP standard, the industrial discharger need analyze only for those TOP organic chemicals which would reasonably be expected to be present. Facilities may apply for a monitoring waiver for any individual TOP organic chemical(s) as described in paragraph (e) of this section for indirect dischargers and 40 CFR 122.44 for direct dischargers. See § 438.2(f) for definition of TOP.

(d) *Cyanide monitoring.* Self-monitoring for cyanide must be conducted after cyanide treatment and before dilution with other wastewater streams. Alternatively, samples of the final effluent may be taken, if the plant limitations are adjusted based on the following dilution ratio: Cyanide-bearing wastewater flow divided by the final effluent flow.

(e) *Monitoring waivers for certain pollutants.* (1) The control authority may authorize a discharger subject to pretreatment standards in this part to forego sampling of a pollutant if the discharger has demonstrated through sampling and other technical factors, as described in paragraph (e)(2) of this section, that the pollutant is not used or generated on-site or is present only at background levels from intake water and without any increase in the pollutant due to activities of the discharger.

(2) Sampling or other technical information, including, but not limited to, information generated during the monitoring for the baseline monitoring report (40 CFR 403.12(b)) or the 90-day compliance report (40 CFR 403.12(d)), must be used to demonstrate that the pollutant is not used or generated on-site or is present only at background levels from intake water and without any increase in the pollutant due to activities of the discharger.

(3) Any grant of the monitoring waiver must be included in the control mechanism as an express condition and the reasons supporting the grant must be documented in the fact sheet or similar supporting documentation.

§ 438.5 Compliance date for pretreatment standards for existing sources.

Any existing source subject to pretreatment standards in this part must be in compliance no later than [DATE 3 years after date of PUBLICATION of FINAL RULE].

Subpart A—General Metals

§ 438.10 Applicability.

(a) This subpart applies to process wastewater discharges from facilities (as specified in § 438.1(a)) other than those subject to subparts B, C, D, E, F, G, or H of this part.

(b) Facilities introducing process wastewater into a POTW at a rate that does not exceed 1 million gallons per year are not subject to § 438.15 or § 438.17.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT. Discharges must remain within the pH range 6 to 9 and must not exceed the following:

EFFLUENT LIMITATIONS

[BPT]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TSS	34	18
2. O&G (as HEM)	15	12
3. TOC (as indicator)	87	50
4. TOP	9.0	4.3
5. Cadmium	0.14	0.09
6. Chromium	0.25	0.14
7. Copper	0.55	0.28
8. Cyanide (T)	0.21	0.13
9. Cyanide (A)	0.14	0.07
10. Lead	0.04	0.03
11. Manganese	0.13	0.09
12. Molybdenum	0.79	0.49
13 Nickel	0.50	0.31
14. Silver	0.22	0.09
15. Sulfide (as S)	31	13
16. Tin	1.4	0.67
17. Zinc	0.38	0.22

[1] mg/L (ppm).

(b) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving

the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.13 Effluent limitations attainable by application of the best control technology for conventional pollutants (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BCT: Limitations for TSS, O&G (as HEM) and pH are the same as the corresponding limitation specified in § 438.12.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BAT: Limitations for TOC (as indicator), TOP, cadmium, chromium, copper, cyanide (T), cyanide (A), lead, manganese, molybdenum, nickel, silver, sulfide (as S), tin, and zinc are the same as the corresponding limitation specified in § 438.12.

(b) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.15 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, and except at facilities where the process wastewater introduced into a POTW does not exceed 1 million gallons per year, any existing source subject to this subpart must achieve the following:

PRETREATMENT STANDARDS
[PSES]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TOC (as indicator)	87	50
2. TOP	9.0	4.3
3. Cadmium	0.14	0.09
4. Chromium	0.25	0.14
5. Copper	0.55	0.28
6. Cyanide (T)	0.21	0.13
7. Cyanide (A)	0.14	0.07
8. Lead	0.04	0.03
9. Manganese	0.13	0.09
10. Molybdenum	0.79	0.49
11. Nickel	0.50	0.31
12. Silver	0.22	0.09
13. Sulfide (as S)	31	13
14. Tin	1.4	0.67
15. Zinc	0.38	0.22

[1] mg/L (ppm).

(b) Upon agreement with the control authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the control authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(d) A POTW has the option of imposing mass-based standards in place of the concentration-based standards. To convert to mass-based standards, multiply each parameter's concentration-based standard times the average daily flow of process wastewater discharged by the source into the POTW.

§ 438.16 New source performance standards (NSPS).

New point sources subject to this subpart must achieve the following new source performance standards (NSPS), as applicable.

(a) Any new point source subject to the provisions of this section and currently subject to the provisions of 433.16 that commenced discharging after [date 10 years prior to the date that is 60 days after the publication date of the final rule] and before [date that is 60 days after the publication date of the final rule] must continue to achieve the applicable standards specified in 40 CFR 433.16. Those standards shall not apply after the expiration of the applicable time period specified in 40 CFR 122.29(d)(1); thereafter, the source must achieve the applicable standards specified in § 438.12 and § 438.14.

(b) The following performance standards apply with respect to each new point source that commences discharge after [date that is 60 days after the publication date of the final rule]. Discharges must remain within the pH range of 6 to 9 and must not exceed the following:

PERFORMANCE STANDARDS
[NSPS]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TSS	28	18
2. O&G (as HEM)	15	12
3. TOC (as indicator)	87	50
4. TOP	9.0	4.3
5. Cadmium	0.02	0.01
6. Chromium	0.17	0.07
7. Copper	0.44	0.16
8. Cyanide (T)	0.21	0.13
9. Cyanide (A)	0.14	0.07
10. Lead	0.04	0.03
11. Manganese	0.29	0.18
12. Molybdenum	0.79	0.49
13. Nickel	1.9	0.75
14. Silver	0.05	0.03
15. Sulfide (as S)	31	13
16. Tin	0.03	0.03
17. Zinc	0.08	0.06

[1] mg/L (ppm).

(c) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(d) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.17 Pretreatment standards for new sources (PSNS).

New sources subject to this subpart must achieve the following pretreatment standards for new sources (PSNS), as applicable.

(a) Any new source subject to the provisions of this section and currently subject to the provisions of 40 CFR 433.17 that commenced discharging after [date 10 years prior to the date that is 60 days after the publication date of the final rule] and before [date that is 60 days after the publication date of the final rule] must continue to achieve the standards specified in 40 CFR 433.17 for ten years beginning on the date the source commenced discharge or during the period of depreciation or amortization of the facility, whichever comes first, after which the source must achieve the standards specified in § 438.15.

(b) Except as provided in 40 CFR 403.7, and except at facilities where the process wastewater introduced into a POTW does not exceed 1 million gallons per year, the following standards apply with respect to each new source that commences discharge after [date

that is 60 days after the publication date of the final rule]:

PRETREATMENT STANDARDS
[PSNS]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TOC (as indicator)	87	50
2. TOP	9.0	4.3
3. Cadmium	0.02	0.01
4. Chromium	0.17	0.07
5. Copper	0.44	0.16
6. Cyanide (T)	0.21	0.13
7. Cyanide (A)	0.14	0.07
8. Lead	0.04	0.03
9. Manganese	0.29	0.18
10. Molybdenum	0.79	0.49
11. Nickel	1.9	0.75
12. Silver	0.05	0.03
13. Sulfide (as S)	31	13
14. Tin 0.03 0.03	0.03	0.03
15. Zinc	0.08	0.06

[1] mg/L (ppm).

(c) Upon agreement with the control authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(d) Upon agreement with the control authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(e) The control authority has the option of imposing mass-based standards in place of the concentration-based standards. To convert to mass-based standards, multiply each parameter's concentration-based standard times the average daily flow of process wastewater discharged by the source into the POTW.

Subpart B—Metal Finishing Job Shops

§ 438.20 Applicability.

(a) This subpart applies to process wastewater discharges from facilities, as specified in § 438.1(a), that operate as a metal finishing job shop (as defined in § 438.21) and perform one or more of the following six operations: electroplating; electroless plating; anodizing; coating (chromating, phosphating, passivating, and coloring); chemical etching and milling; or the manufacture of printed circuit boards (printed wiring boards).

(b) Metal finishing job shops that only perform anodizing without the use of chromic acid or dichromate sealants are not subject to this subpart, but may be subject to subpart C of this part.

(c) Facilities that manufacture, rebuild, or maintain printed wiring boards and do not operate as a job shop (as defined in § 438.21) are not subject to this subpart, but are subject to subpart D of this part.

§ 438.21 Special definitions.

As used in this subpart, *metal finishing job shop* means a facility that owns 50 percent or less (based on metal surface area processed per year) of the materials undergoing metal finishing within the boundaries of a facility.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT. Discharges must remain within the pH range 6 to 9 and must not exceed the following:

EFFLUENT LIMITATIONS
[BPT]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TSS	60	31
2. O&G (as HEM)	52	26
3. TOC (as indicator)	78	59
4. TOP	9.0	4.3
5. Cadmium	0.21	0.09
6. Chromium	1.3	0.55
7. Copper	1.3	0.57
8. Cyanide (T)	0.21	0.13
9. Cyanide (A)	0.14	0.07
10. Lead	0.12	0.09
11. Manganese	0.25	0.10
12. Molybdenum	0.79	0.49
13. Nickel	1.5	0.64
14. Silver	0.15	0.06
15. Sulfide (as S)	31	13
16. Tin	1.8	1.4
17. Zinc	0.35	0.17

[1] mg/L (ppm).

(b) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.23 Effluent limitations attainable by application of the best control technology for conventional pollutants (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BCT: Limitations for TSS, O&G (as HEM) and pH are the same as the corresponding limitation specified in § 438.22.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BAT: Limitations for TOC (as indicator), TOP, cadmium, chromium, copper, cyanide (T), cyanide (A), lead, manganese, molybdenum, nickel, silver, sulfide (as S), tin and zinc are the same as the corresponding limitation specified in § 438.22.

(b) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.25 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart must achieve the following:

PRETREATMENT STANDARDS
[PSES]

Regulated Parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TOC (as indicator)	78	59
2. TOP	9.0	4.3
3. Cadmium	0.21	0.09
4. Chromium	1.3	0.55
5. Copper	1.3	0.57
6. Cyanide (T)	0.21	0.13
7. Cyanide (A)	0.14	0.07
8. Lead	0.12	0.09
9. Manganese	0.25	0.10
10. Molybdenum	0.79	0.49
11. Nickel	1.5	0.64
12. Silver	0.15	0.06
13. Sulfide (as S)	31	13
14. Tin	1.8	1.4
15. Zinc	0.35	0.17

[1] mg/L (ppm).

(b) Upon agreement with the control authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the control authority, facilities must choose to

monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(d) The control authority has the option of imposing mass-based standards in place of the concentration-based standards. To convert to mass-based standards, multiply each parameter's concentration-based standard times the average daily flow of process wastewater discharged by the source into the POTW.

§ 438.26 New source performance standards (NSPS).

New point sources subject to this subpart must achieve the following new source performance standards (NSPS), as applicable.

(a) Any new point source subject to the provisions of this section that commenced discharging after [date 10 years prior to the date that is 60 days after the publication date of the final rule] and before [date that is 60 days after the publication date of the final rule] must continue to achieve the applicable standards specified in 40 CFR 433.16. Those standards shall not apply after the expiration of the applicable time period specified in 40 CFR 122.29(d)(1); thereafter, the source must achieve the applicable standards specified in § 438.22 and § 438.24.

(b) The following performance standards apply with respect to each new point source that commences discharge after [date that is 60 days after the publication date of the final rule]. Discharges must remain within the pH range of 6 to 9 and must not exceed the following:

PERFORMANCE STANDARDS

[NSPS]

Regulated Parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TSS	28	18
2. O&G (as HEM)	15	12
3. TOC (as indicator)	78	59
4. TOP	9.0	4.3
5. Cadmium	0.02	0.01
6. Chromium	0.17	0.07
7. Copper	0.44	0.16
8. Cyanide (T)	0.21	0.13
9. Cyanide (A)	0.14	0.07
10. Lead	0.04	0.03
11. Manganese	0.29	0.18
12. Molybdenum	0.79	0.49
13. Nickel	1.9	0.75
14. Silver	0.05	0.03
15. Sulfide (as S)	31	13
16. Tin	0.03	0.03
17. Zinc	0.08	0.06

[1] mg/L (ppm).

(c) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(d) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.27 Pretreatment standards for new sources (PSNS).

New sources subject to this subpart must achieve the following pretreatment standards for new sources (PSNS), as applicable.

(a) Any new source subject to the provisions of this section that commenced discharging after [date 10 years prior to the date that is 60 days after the publication date of the final rule] and before [date that is 60 days after the publication date of the final rule] must continue to achieve the standards specified in 40 CFR 433.17 for ten years beginning on the date the source commenced discharge or during the period of depreciation or amortization of the facility, whichever comes first, after which the source must achieve the standards specified in § 438.25.

(b) Except as provided in 40 CFR 403.7, the following standards apply with respect to each new source that commences discharge after [date that is 60 days after the publication date of the final rule]:

PRETREATMENT STANDARDS

[PSNS]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TOC (as indicator)	78	59
2. TOP	9.0	4.3
3. Cadmium	0.02	0.01
4. Chromium	0.17	0.07
5. Copper	0.44	0.16
6. Cyanide (T)	0.21	0.13
7. Cyanide (A)	0.14	0.07
8. Lead	0.04	0.03
9. Manganese	0.29	0.18
10. Molybdenum	0.79	0.49
11. Nickel	1.9	0.75
12. Silver	0.05	0.03
13. Sulfide (as S)	31	13
14. Tin	0.03	0.03
15. Zinc	0.08	0.06

[1] mg/L (ppm).

(c) Upon agreement with the control authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(d) Upon agreement with the control authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(e) The control authority has the option of imposing mass-based standards in place of the concentration-based standards. To convert to mass-based standards, multiply each parameter's concentration-based standard times the average daily flow of process wastewater discharged by the source into the POTW.

Subpart C—Non-Chromium Anodizing

§ 438.30 Applicability.

(a) Except for facilities that discharge to a POTW, this subpart applies to discharges of process wastewater resulting from non-chromium anodizing, as defined in § 438.31.

(b) Facilities which commingle wastewater from non-chromium anodizing with wastewater subject to subparts A, B, or D of this part are not subject to this subpart but are subject to subparts A, B, or D of this part, as applicable.

(c) Facilities that discharge to a POTW and perform anodizing without the use of chromic acid or dichromate sealants are subject to 40 CFR part 413 or 40 CFR part 433, as applicable.

§ 438.31 Special definitions.

As used in this subpart, *non-chromium anodizing* means anodizing without the use of chromic acid or dichromate sealants.

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

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT. Discharges must remain within the pH range 6 to 9 and must not exceed the following:

EFFLUENT LIMITATIONS

[BPT]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TSS	60	31
2. O&G (as HEM)	52	26
3. Aluminum	8.2	4.0
4. Manganese	0.13	0.09
5. Nickel	0.50	0.31
6. Zinc	0.38	0.22

[1] mg/L (ppm).

§ 438.33 Effluent limitations attainable by application of the best control technology for conventional pollutants (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BCT: Limitations for TSS, O&G (as HEM) and pH are the same as the corresponding limitation specified in § 438.32.

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

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BAT: Limitations for aluminum, manganese, nickel and zinc are the same as the corresponding limitation specified in § 438.32.

§ 438.36 New source performance standards (NSPS).

New point sources subject to this subpart must achieve the following new source performance standards (NSPS), as applicable.

(a) Any new point source subject to the provisions of this section that commenced discharging after [date 10 years prior to the date that is 60 days after the publication date of the final rule] and before [date that is 60 days after the publication date of the final rule] must continue to achieve the applicable standards specified in 40 CFR 433.16. Those standards shall not apply after the expiration of the applicable time period specified in 40 CFR 122.29(d)(1); thereafter, the source must achieve the applicable standards specified in § 438.32 and § 438.34.

(b) The following performance standards apply with respect to each new point source that commences discharge after [date that is 60 days after the publication date of the final rule]. Discharges must remain within the pH range of 6 to 9 and must not exceed the following:

PERFORMANCE STANDARDS

[NSPS]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TSS	52	22
2. O&G (as HEM)	15	12
3. Aluminum	8.2	4.0
4. Manganese	0.13	0.09
5. Nickel	0.50	0.31
6. Zinc	0.38	0.22

[1] mg/L (ppm).

Subpart D—Printed Wiring Boards

§ 438.40 Applicability.

(a) This subpart applies to discharges of process wastewater resulting from the manufacture, maintenance and repair of printed wiring boards (printed circuit boards).

(b) Printed wiring board operations conducted at a metal finishing job shop (as defined in § 438.21) are not subject to this subpart.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT. Discharges must remain within the pH range 6 to 9 and must not exceed the following:

EFFLUENT LIMITATIONS

[BPT]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TSS	60	31
2. O&G (as HEM)	52	26
3. TOC (as indicator)	101	67
4. TOP	9.0	4.3
5. Chromium	0.25	0.14
6. Copper	0.55	0.28
7. Cyanide (T)	0.21	0.13
8. Cyanide (A)	0.14	0.07
9. Lead	0.04	0.03
10. Manganese	1.3	0.64
11. Nickel	0.30	0.14
12. Sulfide (as S)	31	13
13. Tin	0.31	0.14
14. Zinc	0.38	0.22

[1] mg/L (ppm).

(b) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.43 Effluent limitations attainable by application of the best control technology for conventional pollutants (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BCT: Limitations for TSS, O&G (as HEM) and pH are the same as the corresponding limitation specified in § 438.42.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BAT: Limitations for TOC (as indicator), TOP, chromium, copper, cyanide (T), cyanide (A), lead, manganese, nickel, sulfide (as S), tin and zinc are the same as the corresponding limitation specified in § 438.42.

(b) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.45 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart must achieve the following pretreatment standards:

PRETREATMENT STANDARDS

[PSES]

Regulated parameter	Maximum daily [1]	Maximum Monthly avg.[1]
1. TOC (as indicator)	101	67
2. TOP	9.0	4.3
3. Chromium	0.25	0.14
4. Copper	0.55	0.28
5. Cyanide (T)	0.21	0.13
6. Cyanide (A)	0.14	0.07
7. Lead	0.04	0.03
8. Manganese	1.3	0.64
9. Nickel	0.30	0.14
10. Sulfide (as S)	31	13
11. Tin	0.31	0.14
12. Zinc	0.38	0.22

[1] mg/L (ppm).

(b) Upon agreement with the control authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the control authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(d) The control authority has the option of imposing mass-based

standards in place of the concentration-based standards. To convert to mass-based standards, multiply each parameter's concentration-based standard times the average daily flow of process wastewater discharged by the source into the POTW.

§ 438.46 New source performance standards (NSPS).

New point sources subject to this subpart must achieve the following new source performance standards (NSPS), as applicable.

(a) Any new point source subject to the provisions of this section that commenced discharging after [date 10 years prior to the date that is 60 days after the publication date of the final rule] and before [date that is 60 days after the publication date of the final rule] must continue to achieve the applicable standards specified in 40 CFR 433.16. Those standards shall not apply after the expiration of the applicable time period specified in 40 CFR 122.29(d)(1); thereafter, the source must achieve the applicable standards specified in § 438.42 and § 438.44.

(b) The following performance standards apply with respect to each new point source that commences discharge after [date that is 60 days after the publication date of the final rule]. Discharges must remain within the pH range of 6 to 9 and must not exceed the following:

PERFORMANCE STANDARDS
[NSPS]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TSS	28	18
2. O&G (as HEM)	15	12
3. TOC (as indicator)	101	67
4. TOP	9.0	4.3
5. Chromium	0.17	0.07
6. Copper	0.01	0.01
7. Cyanide (T)	0.21	0.13
8. Cyanide (A)	0.14	0.07
9. Lead	0.04	0.03
10. Manganese	0.29	0.18
11. Nickel	1.9	0.75
12. Sulfide (as S)	31	13
13. Tin	0.09	0.07
14. Zinc	0.08	0.06

[1] mg/L (ppm).

(c) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(d) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.47 Pretreatment standards for new sources (PSNS).

New sources subject to this subpart must achieve the following pretreatment standards for new sources (PSNS), as applicable.

(a) Any new source subject to the provisions of this section that commenced discharging after [date 10 years prior to the date that is 60 days after the publication date of the final rule] and before [date that is 60 days after the publication date of the final rule] must continue to achieve the standards specified in 40 CFR 433.17 for ten years beginning on the date the source commenced discharge or during the period of depreciation or amortization of the facility, whichever comes first, after which the source must achieve the standards specified in § 438.45.

(b) Except as provided in 40 CFR 403.7, the following standards apply with respect to each new source that commences discharge after [date that is 60 days after the publication date of the final rule]:

PRETREATMENT STANDARDS
[PSNS]

Regulated parameter	Maximum daily [1]	Maximum monthly avg.[1]
1. TOC (as indicator)	101	67
2. TOP	9.0	4.3
3. Chromium	0.17	0.07
4. Copper	0.01	0.01
5. Cyanide (T)	0.21	0.13
6. Cyanide (A)	0.14	0.07
7. Lead	0.04	0.03
8. Manganese	0.29	0.18
9. Nickel	1.9	0.75
10. Sulfide (as S)	31	13
11. Tin	0.09	0.07
12. Zinc	0.08	0.06

[1] mg/L (ppm).

(c) Upon agreement with the control authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(d) Upon agreement with the control authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(e) The control authority has the option of imposing mass-based standards in place of the concentration-based standards. To convert to mass-based standards, multiply each parameter's concentration-based standard times the average daily flow of process wastewater discharged by the source into the POTW.

Subpart E—Steel Forming and Finishing

§ 438.50 Applicability.

(a) This subpart applies to discharges of process wastewater from surface finishing or cold forming operations on steel wire, rod, bar, pipe or tubing. This subpart does not apply to process wastewater from these same operations when they are performed on base materials other than steel.

(b) Wastewater discharges from the following operations on steel are not subject to this subpart: any hot forming operation; and cold forming, continuous electroplating, or continuous hot dip coating of sheets, strips or plates. Wastewater discharges from performing these operations on steel are subject to 40 CFR part 420.

§ 438.51 Special definitions.

As used in this subpart:

(a) *Acid pickling* means the removal of scale and/or oxide from steel surfaces using acid solutions. The mass-based limitations for acid pickling operations include wastewater flow volumes from acid treatment with and without chromium, acid pickling neutralization, annealing, alkaline cleaning, electrolytic sodium sulfate descaling, and salt bath descaling.

(b) *Alkaline cleaning* means the application of solutions containing caustic soda, soda ash, alkaline silicates, or alkaline phosphates to a metal surface primarily for removing mineral deposits, animal fats, and oils. The mass-based limitations for alkaline cleaning operations include wastewater flow volumes from alkaline cleaning for oil removal, alkaline treatment without cyanide, aqueous degreasing, annealing, and electrolytic cleaning operations.

(c) *Cold forming* means operations conducted on unheated steel for purposes of imparting desired mechanical properties and surface qualities (density, smoothness) to the steel. The mass-based limitations for cold forming operations are based on zero wastewater discharge from welding operations.

(d) *Continuous Annealing* means a heat treatment process in which steel is exposed to an elevated temperature in a controlled atmosphere for an extended period of time and then cooled. The mass-based limitations for continuous annealing operations include wastewater flow volumes from heat treating operations.

(e) *Electroplating* means the application of metal coatings including,

but not limited to, chromium, copper, nickel, tin, zinc, and combinations thereof, on steel products using an electro-chemical process. The mass-based limitations for electroplating operations includes wastewater flow volumes from acid pickling, annealing, alkaline cleaning, electroplating without chromium or cyanide, and electroless plating operations.

(f) *Hot Dip Coating* means the coating of pre-cleaned steel parts by immersion in a molten metal bath. The mass-based limitations for hot dip coating operations includes wastewater flow volumes from acid pickling, annealing, alkaline cleaning, chemical conversion coating without chromium, chromate conversion coating, galvanizing, and hot dip coating operations.

(g) *Lubrication* means the process of applying a substance to the surface of the steel in order to reduce friction or corrosion. The mass-based limitations for lubrication operations includes wastewater flow volumes from corrosion preventive coating operations as defined in § 438.61(b).

(h) *Mechanical Descaling* means the process of removing scale by mechanical or physical means from the surface of steel. The mass-based limitations for mechanical descaling operations includes wastewater flow volumes from abrasive blasting, burnishing, grinding, impact deformation, machining, and testing operations.

(i) *Painting* means applying an organic coating to a steel bar, rod, wire, pipe, or tube. The mass-based limitations for painting operations includes wastewater flow volumes from spray or brush painting and immersion painting.

(j) *Pressure Deformation* means applying force (other than impact force) to permanently deform or shape a steel bar, rod, wire, pipe, or tube. The mass-based limitations for pressure deformation operations includes wastewater flow volumes from forging operations and extrusion operations.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT. Discharges must remain within the pH range 6 to 9 and must not exceed the following:

EFFLUENT LIMITATIONS [BPT]
TABLE 1

Pollutant	TSS		O&G (as HEM)	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.0709	0.0369	0.0312	0.0239
(b) Alkaline Cleaning	0.0709	0.0369	0.0312	0.0239
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.00355	0.00184	0.00156	0.00120
(e) Electroplating	0.142	0.0737	0.0623	0.0478
(f) Hot Dip Coating	0.0206	0.0107	0.00903	0.00693
(g) Lubrication	0.00170	0.000884	0.000748	0.000574
(h) Mechanical Descaling	0.000284	0.000148	0.000125	0.0000956
(i) Painting	0.00922	0.00479	0.00405	0.00311
(j) Pressure Deformation	0.00355	0.00184	0.00156	0.00120

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 2

Pollutant	TOC		TOP	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.181	0.103	0.0188	0.00896
(b) Alkaline Cleaning	0.181	0.103	0.0188	0.00896
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.00901	0.00514	0.000937	0.000448
(e) Electroplating	0.361	0.206	0.0375	0.0180
(f) Hot Dip Coating	0.0523	0.0300	0.00543	0.00260
(g) Lubrication	0.000433	0.00247	0.000450	0.000215
(h) Mechanical Descaling	0.000721	0.000411	0.0000750	0.0000359
(i) Painting	0.0235	0.0134	0.00244	0.00117
(j) Pressure Deformation	0.00901	0.00514	0.000937	0.000448

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 3

Pollutant	Cadmium		Chromium	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.000292	0.000188	0.000509	0.000277
(b) Alkaline Cleaning	0.000292	0.000188	0.000509	0.000277
(c) Cold Forming	0	0	0	0

TABLE 3—Continued

Pollutant	Cadmium		Chromium	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(d) Continuous Annealing	0.0000146	0.00000938	0.0000255	0.0000139
(e) Electroplating	0.000583	0.000376	0.00102	0.000553
(f) Hot Dip Coating	0.0000845	0.0000545	0.000148	0.0000801
(g) Lubrication	0.00000699	0.00000450	0.0000123	0.00000663
(h) Mechanical Descaling	0.00000116	0.00000075	0.00000204	0.00000110
(i) Painting	0.0000379	0.0000244	0.0000662	0.0000359
(j) Pressure Deformation	0.0000146	0.00000938	0.0000255	0.0000139

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 4

Pollutant	Copper		Lead	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.00114	0.000565	0.0000737	0.0000522
(b) Alkaline Cleaning	0.00114	0.000565	0.0000737	0.0000522
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.0000570	0.0000283	0.00000368	0.00000261
(e) Electroplating	0.00228	0.00113	0.000148	0.000105
(f) Hot Dip Coating	0.000331	0.000164	0.0000214	0.0000152
(g) Lubrication	0.0000274	0.0000136	0.00000177	0.00000125
(h) Mechanical Descaling	0.00000455	0.00000226	0.00000029	0.00000021
(i) Painting	0.000148	0.0000734	0.00000957	0.00000678
(j) Pressure Deformation	0.0000570	0.0000283	0.00000368	0.00000261

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 5

Pollutant	Manganese		Molybdenum	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.000269	0.000183	0.00164	0.00103
(b) Alkaline Cleaning	0.000269	0.000183	0.00164	0.00103
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.0000135	0.00000914	0.0000820	0.0000511
(e) Electroplating	0.000537	0.000366	0.00328	0.00205
(f) Hot Dip Coating	0.0000779	0.0000531	0.000476	0.000297
(g) Lubrication	0.00000644	0.00000439	0.0000394	0.0000246
(h) Mechanical Descaling	0.00000107	0.00000073	0.00000656	0.00000409
(i) Painting	0.0000350	0.0000238	0.000214	0.000133
(j) Pressure Deformation	0.0000135	0.00000914	0.0000820	0.0000511

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 6

Pollutant	Nickel		Silver	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.00104	0.000642	0.000456	0.000187
(b) Alkaline Cleaning	0.00104	0.000642	0.000456	0.000187
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.0000520	0.0000321	0.0000228	0.00000934
(e) Electroplating	0.00208	0.00129	0.000912	0.000374
(f) Hot Dip Coating	0.000302	0.000186	0.000133	0.0000542
(g) Lubrication	0.0000250	0.0000154	0.0000110	0.00000448
(h) Mechanical Descaling	0.00000415	0.00000257	0.00000182	0.00000075
(i) Painting	0.000135	0.0000834	0.0000593	0.0000243
(j) Pressure Deformation	0.0000520	0.0000321	0.0000228	0.00000934

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 7

Pollutant	Sulfide (as S)		Tin	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.0630	0.0267	0.00274	0.00139
(b) Alkaline Cleaning	0.0630	0.0267	0.00274	0.00139
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.00315	0.00134	0.000137	0.0000694
(e) Electroplating	0.126	0.0534	0.00547	0.00278
(f) Hot Dip Coating	0.0183	0.00774	0.000793	0.000403
(g) Lubrication	0.00151	0.000641	0.0000656	0.0000333
(h) Mechanical Descaling	0.000252	0.000107	0.0000110	0.00000555
(i) Painting	0.00818	0.00347	0.000356	0.000181
(j) Pressure Deformation	0.00315	0.00134	0.000137	0.0000694

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 8

Pollutant	Zinc	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.000793	0.000456
(b) Alkaline Cleaning	0.000793	0.000456
(c) Cold Forming	0	0
(d) Continuous Annealing	0.0000397	0.0000228
(e) Electroplating	0.00159	0.000912
(f) Hot Dip Coating	0.000230	0.000133
(g) Lubrication	0.0000191	0.0000110
(h) Mechanical Descaling	0.00000317	0.00000182
(i) Painting	0.000103	0.0000593
(j) Pressure Deformation	0.0000397	0.0000228

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 9

Pollutant	Cyanide (T)		Cyanide (A)	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(e) Electroplating	0.000865	0.000513	0.000580	0.000282

[1] Pounds per 1000 lbs. (gm/kg) of product.

(b) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a). (d) Permit limitations must be established in accordance with § 438.58.

§ 438.53 Effluent limitations attainable by application of the best control technology for conventional pollutants (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BCT: Limitations for TSS, O&G (as HEM), and pH are the same as the corresponding limitation specified in § 438.52.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BAT: Limitations for TOC (as indicator), TOP, cadmium, chromium, copper, cyanide (T), cyanide (A), lead, manganese, molybdenum, nickel, silver, sulfide (as S), tin, and zinc are the same as the corresponding limitation specified in § 438.52.

(b) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.55 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart must achieve the following pretreatment standards: Limitations for TOC (as indicator), TOP, cadmium, chromium, copper, cyanide (T), cyanide (A), lead, manganese, molybdenum, nickel, silver, sulfide (as S), tin, and zinc are the same as the corresponding limitation specified in § 438.52.

(b) Upon agreement with the control authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(c) Upon agreement with the control authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(d) Pretreatment standards must be established in accordance with § 438.58.

§ 438.56 New source performance standards (NSPS).

New point sources subject to this subpart must achieve the following new source performance standards (NSPS), as applicable.

(a) Any new point source subject to the provisions of this section that commenced discharging after [date 10 years prior to the date that is 60 days after the publication date of the final rule] and before [date that is 60 days after the publication date of the final rule] must continue to achieve the applicable new source standards specified in 40 CFR part 420. Those standards shall not apply after the expiration of the applicable time period specified in 40 CFR 122.29(d)(1); thereafter, the source must achieve the applicable standards specified in §§ 438.52 and 438.54.

(b) The following performance standards apply with respect to each new point source that commences discharge after [date that is 60 days after the publication date of the final rule]. Discharges must remain within the pH range of 6 to 9 and must not exceed the following:

PERFORMANCE STANDARDS [NSPS]

TABLE 1

Pollutant	TSS		O&G (as HEM)	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.0571	0.0358	0.0312	0.0239
(b) Alkaline Cleaning	0.0571	0.0358	0.0312	0.0239
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.00286	0.00179	0.00156	0.00120
(e) Electroplating	0.115	0.0716	0.0623	0.00478
(f) Hot Dip Coating	0.0166	0.0104	0.00903	0.00693
(g) Lubrication	0.00137	0.000859	0.000748	0.000574
(h) Mechanical Descaling	0.000229	0.000144	0.000125	0.0000956
(i) Painting	0.00743	0.00466	0.00405	0.00311
(j) Pressure Deformation	0.00286	0.00179	0.00156	0.00120

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 2

Pollutant	TOC		TOP	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg. [1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.181	0.103	0.0188	0.00896
(b) Alkaline Cleaning	0.181	0.103	0.0188	0.00896
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.00901	0.00514	0.000937	0.000448
(e) Electroplating	0.361	0.206	0.0375	0.0180
(f) Hot Dip Coating	0.0523	0.0298	0.00543	0.00260
(g) Lubrication	0.00433	0.00247	0.000450	0.000215
(h) Mechanical Descaling	0.000721	0.000411	0.0000750	0.0000359
(i) Painting	0.0235	0.0134	0.00244	0.00117
(j) Pressure Deformation	0.00901	0.00514	0.000937	0.000448

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 3

Pollutant	Cadmium		Chromium	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.0000267	0.0000184	0.000355	0.000143
(b) Alkaline Cleaning	0.0000267	0.0000184	0.000355	0.000143
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.00000133	0.00000092	0.0000178	0.00000714
(e) Electroplating	0.0000534	0.0000368	0.000710	0.000286
(f) Hot Dip Coating	0.00000773	0.00000533	0.000103	0.0000415
(g) Lubrication	0.00000064	0.00000044	0.00000851	0.00000343
(h) Mechanical Descaling	0.00000011	0.00000007	0.00000142	0.00000057
(i) Painting	0.00000347	0.00000239	0.0000461	0.0000186
(j) Pressure Deformation	0.00000133	0.00000092	0.0000178	0.00000714

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 4

Pollutant	Copper		Lead	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.000898	0.000327	0.0000692	0.0000517
(b) Alkaline Cleaning	0.000898	0.000327	0.0000692	0.0000517
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.0000449	0.0000164	0.00000346	0.00000258
(e) Electroplating	0.00180	0.000654	0.000139	0.000104
(f) Hot Dip Coating	0.000261	0.0000949	0.0000201	0.0000150
(g) Lubrication	0.0000216	0.00000785	0.00000166	0.00000124
(h) Mechanical Descaling	0.00000359	0.00000131	0.00000028	0.00000021
(i) Painting	0.000117	0.0000425	0.00000899	0.00000671
(j) Pressure Deformation	0.0000449	0.0000164	0.00000346	0.00000258

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 5

Pollutant	Manganese		Molybdenum	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.000600	0.000364	0.00164	0.00103
(b) Alkaline Cleaning	0.000600	0.000364	0.00164	0.00103
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.0000300	0.0000182	0.0000820	0.0000511
(e) Electroplating	0.00120	0.000728	0.00328	0.00205
(f) Hot Dip Coating	0.000174	0.000106	0.000476	0.000297
(g) Lubrication	0.0000144	0.00000873	0.0000394	0.0000246
(h) Mechanical Descaling	0.00000240	0.00000146	0.00000656	0.00000409
(i) Painting	0.0000780	0.0000473	0.000214	0.000133
(j) Pressure Deformation	0.0000300	0.0000182	0.0000820	0.0000511

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 6

Pollutant	Nickel		Silver	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.00391	0.00156	0.0000955	0.0000582
(b) Alkaline Cleaning	0.00391	0.00156	0.0000955	0.0000582
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.000196	0.0000779	0.00000477	0.00000291
(e) Electroplating	0.00782	0.00312	0.000191	0.000117
(f) Hot Dip Coating	0.00114	0.000452	0.0000277	0.0000169
(g) Lubrication	0.0000939	0.0000374	0.00000229	0.00000140
(h) Mechanical Descaling	0.0000157	0.00000623	0.00000038	0.00000023
(i) Painting	0.000509	0.000203	0.0000125	0.00000756
(j) Pressure Deformation	0.000196	0.0000779	0.00000477	0.00000291

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 7

Pollutant	Sulfide (as S)		Tin	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.0630	0.0267	0.0000606	0.0000453
(b) Alkaline Cleaning	0.0630	0.0267	0.0000606	0.0000453
(c) Cold Forming	0	0	0	0
(d) Continuous Annealing	0.00315	0.00134	0.00000303	0.00000226
(e) Electroplating	0.126	0.0534	0.000122	0.0000905
(f) Hot Dip Coating	0.0183	0.00774	0.0000176	0.0000132
(g) Lubrication	0.00151	0.000641	0.00000145	0.00000109
(h) Mechanical Descaling	0.000252	0.000107	0.00000024	0.00000018
(i) Painting	0.00818	0.00347	0.00000788	0.00000588

TABLE 7—Continued

Pollutant	Sulfide (as S)		Tin	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(j) Pressure Deformation	0.00315	0.00134	0.00000303	0.00000226

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 8

Pollutant	Zinc	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]
(a) Acid Pickling	0.000163	0.000111
(b) Alkaline Cleaning	0.000163	0.000111
(c) Cold Forming	0	0
(d) Continuous Annealing	0.00000811	0.00000553
(e) Electroplating	0.000325	0.000222
(f) Hot Dip Coating	0.0000471	0.0000321
(g) Lubrication	0.00000389	0.00000265
(h) Mechanical Descaling	0.00000065	0.00000044
(i) Painting	0.0000211	0.0000144
(j) Pressure Deformation	0.00000811	0.00000553

[1] Pounds per 1000 lbs. (gm/kg) of product.

TABLE 9

Pollutant	Cyanide (T)		Cyanide (A)	
Forming/finishing operation	Maximum daily [1]	Maximum monthly avg.[1]	Maximum daily [1]	Maximum monthly avg.[1]
(a) Electroplating	0.000865	0.000513	0.000580	0.000282

[1] Pounds per 1000 lbs. (gm/kg) of product.

(c) Upon agreement with the permitting authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(d) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(e) Performance standards must be established in accordance with § 438.58.

§ 438.57 Pretreatment standards for new sources (PSNS).

New sources subject to this subpart must achieve the following pretreatment standards for new sources (PSNS), as applicable.

(a) Any new source subject to the provisions of this section that commenced discharging after [date 10 years prior to the date that is 60 days after the publication date of the final rule] and before [date that is 60 days after the publication date of the final rule] must continue to achieve the applicable new source standards specified in 40 CFR part 420 for ten years beginning on the date the source commenced discharge or during the period of depreciation or amortization of the facility, whichever comes first, after which the source must achieve the standards specified in § 438.55.

(b) Except as provided in 40 CFR 403.7, the following standards apply with respect to each new source that commences discharge after [date that is 60 days after the publication date of the final rule]: Limitations for TOC (as indicator), TOP, cadmium, chromium, copper, cyanide (T), cyanide (A), lead, manganese, molybdenum, nickel, silver, sulfide (as S), tin, and zinc are the same as the corresponding limitation specified in § 438.56.

(c) Upon agreement with the control authority and pursuant to § 438.4(d), facilities with cyanide treatment have the option of achieving the limitation for either cyanide (T) or cyanide (A).

(d) Upon agreement with the control authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(e) Pretreatment standards must be established in accordance with § 438.58.

§ 438.58 Calculation of NPDES and pretreatment permit effluent limitations.

(a) Production-based limitations in NPDES permits must comply with 40 CFR 122.45(b)(2)(i). The average rate of production reported by the owner or operator in accordance with 40 CFR 403.12(b)(3) shall be based not upon the design production capacity but rather upon a reasonable measure of actual production of the facility, such as the production during the high month of the previous year, or the monthly average for the highest of the previous five years. For new sources or new dischargers, actual production shall be estimated using projected production.

(b) The following protocols shall be used when calculating the operating rate for Subpart E:

(1) For similar, multiple production lines with process waters treated in the same wastewater treatment system, the reasonable measure of production (the daily operating rate) shall be determined from the combined production of the similar production lines during the same time period.

(2) For process wastewater treatment systems where wastewater from two or more different production lines are

commingled in the same wastewater treatment system, the reasonable measure of production (the daily operating rate) shall be determined separately for each production line (or combination of similar production lines) during the same time period.

(c) Mass effluent limitations and pretreatment requirements for each forming/finishing operation shall be computed by multiplying the average daily operating rate (or other reasonable measure of production), as determined in accordance with § 438.58(b), by the respective effluent limitations guidelines or standards. The mass effluent limitations or pretreatment requirements applicable at a given NPDES or pretreatment compliance monitoring point shall be the sum of the mass effluent limitations or pretreatment requirements for each regulated pollutant parameter within each applicable forming/finishing operation with process wastewater discharging to that compliance monitoring point.

(d) Mass NPDES permit effluent limitations or pretreatment requirements derived from this part shall remain in effect for the term of the NPDES permit or pretreatment control mechanism, except:

(1) When the permit is modified in accordance with § 122.62 of this chapter or local POTW permit modification provisions; or

(2) Where the NPDES permit authorizes alternate effluent limitations for increased or decreased production levels in accordance with § 122.45(b)(2)(ii)(A)(1) of this chapter.

(e) Production from unit operations that do not generate or discharge process wastewater shall not be included in the calculation of the operating rate.

Subpart F—Oily Wastes

§ 438.60 Applicability.

(a) This subpart applies to process wastewater from facilities specified in § 438.1(a) that discharge wastewater exclusively from oily operations (as defined in § 438.61) and are not otherwise subject to subparts G or H of this part.

(b) Facilities introducing process wastewater into a POTW at a rate that does not exceed 2 million gallons per year are not subject to the pretreatment standards (§§ 438.65 and 438.67) of this subpart.

§ 438.61 Special definitions.

(a) As used in this subpart, *oily operations* means one or more of the following: Alkaline cleaning for oil removal; aqueous or solvent degreasing; corrosion preventive coating (as specified in § 438.61(b)); floor cleaning; grinding; heat treating; deformation by impact or pressure; machining; painting; steam cleaning; laundering; and testing (such as, hydrostatic, dye penetrant, ultrasonic, magnetic flux).

(b) *Corrosion preventive coating* means the application of removable oily or organic solutions to protect metal surfaces against corrosive environments. Corrosion preventive coatings include, but are not limited to: petrolatum compounds, oils, hard dry-film compounds, solvent-cutback petroleum-based compounds, emulsions, water-displacing polar compounds, and fingerprint removers and neutralizers. Corrosion preventive coating does not include electroplating, or chemical conversion coating (including phosphate conversion coating) operations.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT. Discharges must remain within the pH range 6 to 9 and must not exceed the following:

EFFLUENT LIMITATIONS

[BPT]

Regulated parameter	Maximum daily [1]	Maximum monthly avg. [1]
1. TSS	63	31
2. O&G (as HEM)	27	20
3. TOC (as indicator)	633	378
4. TOP	9.0	4.3
5. Sulfide (as S)	31	13

[1] mg/L (ppm).

(b) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.63 Effluent limitations attainable by application of the best control technology for conventional pollutants (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BCT: Limitations for TSS, O&G (as HEM) and pH are the same as the corresponding limitation specified in § 438.62.

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

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BAT: Limitations for TOC (as indicator), TOP and sulfide (as S) are the same as the corresponding limitation specified in § 438.62.

(b) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.65 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, and except at facilities where the process wastewater introduced into a POTW does not exceed 2 million gallons per year, any existing source subject to this subpart must achieve the following pretreatment standards:

PRETREATMENT STANDARDS

[PSES]

Regulated parameter	Maximum daily [1]	Maximum monthly avg. [1]
1. TOC (as indicator)	633	378
2. TOP	9.0	4.3
3. Sulfide (as S)	31	13

[1] mg/L (ppm).

(b) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(c) The control authority has the option of imposing mass-based standards in place of the concentration-based standards. To convert to mass-based standards, multiply each parameter's concentration-based standard times the average daily flow of process wastewater discharged by the source into the POTW.

§ 438.66 New source performance standards (NSPS).

(a) Any new point source subject to this subpart must achieve performance standards for TSS, O&G (as HEM), TOC (as indicator), TOP, sulfide (as S) and pH, which are the same as the corresponding limitation specified in § 438.62.

(b) Upon agreement with the permitting authority, facilities must

choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

§ 438.67 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7, or except at facilities where the process wastewater introduced into a POTW does not exceed 2 million gallons per year, any existing source subject to this subpart must achieve pretreatment standards for TOC (as indicator), TOP and sulfide (as S), which are the same as the corresponding standard specified in § 438.65.

(b) Upon agreement with the permitting authority, facilities must choose to monitor for TOP or TOC, or implement a management plan for organic chemicals as specified in § 438.4(a).

(c) The control authority has the option of imposing mass-based standards in place of the concentration-based standards. To convert to mass-based standards, multiply each parameter's concentration-based standard times the average daily flow of process wastewater discharged by the source into the POTW.

Subpart G—Railroad Line Maintenance

§ 438.70 Applicability.

(a) This subpart applies to discharges of process wastewater from facilities that perform routine cleaning and light maintenance on railroad engines, cars, car-wheel trucks, or similar parts or machines, and discharge wastewater exclusively from oily operations (as defined in § 438.61(a)) or from washing of the final product.

(b) Facilities engaged in the manufacture, overhaul or heavy maintenance of railroad engines, cars, car-wheel trucks, or similar parts or machines are not subject to this subpart. These facilities may be subject to Subpart A or F of this part.

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

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT. Discharges must remain within the pH range 6 to 9 and must not exceed the following:

EFFLUENT LIMITATIONS

[BPT]

Regulated parameter	Maximum daily [1]	Maximum monthly avg. [1]
1. BOD_5	34	12
2. TSS	30	16
3. O&G (as HEM)	11	8

[1] mg/L (ppm).

§ 438.73 Effluent limitations attainable by application of the best control technology for conventional pollutants (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BCT: Limitations for BOD_5, TSS, O&G (as HEM) and pH are the same as the corresponding limitation specified in § 438.72.

§ 438.76 New source performance standards (NSPS).

Any new point source subject to this subpart must achieve performance standards for BOD_5, TSS, O&G (as HEM) and pH, which are the same as the corresponding limitation specified in § 438.72.

Subpart H—Shipbuilding Dry Docks

§ 438.80 Applicability.

(a) This subpart applies to discharges of process wastewater generated in or on dry docks and similar structures, such as graving docks, building ways, marine railways and lift barges at shipbuilding facilities (or shipyards). This subpart applies to the following when generated by operations from within a dry dock or similar structure: process wastewater generated inside and outside the vessel (including bilge water) and wastewater generated from barnacle removal conducted as preparation for ship maintenance, rebuilding or repair.

(b) The following wastewater discharges are not subject to this subpart:

(1) Wastewater from ''on-shore'' operations (that is, other than dry docks and similar structures) at a shipyard.

(2) Wastewater generated on board ships and boats when they are afloat (that is, not in dry docks or similar structures). Wastewater generated on U.S. military ships and boats afloat in U.S. waters are subject to the Uniform Discharge Standards (UNDS) at 40 CFR part 1700.

(3) Flooding water (as defined in § 438.81(a)), dry dock ballast water (as defined in § 438.81(b)), and storm water.

§ 438.81 Special definitions.

As used in this subpart:

(a) *Flooding water* means water that is used to float ships or boats into the dry dock or similar structure and is discharged prior to performing any MP&M operations, or water that is used to float ships or boats out of the dry dock or similar structure after all MP&M operations have ceased.

(b) *Dry dock ballast water* means water that enters and exits the dry dock or similar structure for the purpose of sinking or raising the dry dock.

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

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT. Discharges must remain within the pH range 6 to 9 and must not exceed the following:

EFFLUENT LIMITATIONS

[BPT]

Regulated parameter	Maximum daily [1]	Maximum monthly avg. [1]
1. TSS	81	44
2. O&G (as HEM)	16	11

[1] mg/L (ppm).

§ 438.83 Effluent limitations attainable by application of the best control technology for conventional pollutants (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitation representing the application of BCT: Limitations for TSS, O&G (as HEM) and pH are the same as the corresponding limitation specified in § 438.82.

§ 438.86 New source performance standards (NSPS).

Any new point source subject to this subpart must achieve performance standards for TSS, O&G (as HEM) and pH, which are the same as the corresponding limitation specified in § 438.82.

APPENDIX A TO PART 483—TYPICAL PRODUCTS IN METAL PRODUCTS & MACHINERY SECTORS

AEROSPACE	AIRCRAFT	BUS & TRUCK
Guided Missiles & Space Vehicle	Aircraft Engines & Engine Parts	Bus Terminal & Service Facilities
Guided Missile & Space Vehicle Prop.	Aircraft Frames Manufacturing	Courier Services, Except by Air Freight Truck Terminals, W/ or W/O Maintenance
Other Space Vehicle & Missile Parts	Aircraft Parts & Equipment	Intercity & Rural Highways (Buslines)
	Airports, Flying Fields, & Services	Local & Suburban Transit (Bus & subway)
		Local Passenger. Trans. (Lim., Amb., Sight See)
		Local Trucking With Storage
		Local Trucking Without Storage
		Motor Vehicle Parts & Accessories
		School Buses
		Trucking
		Truck & Bus Bodies
		Truck Trailers

ELECTRONIC EQUIPMENT	HARDWARE	HOUSEHOLD EQUIPMENT
Communications Equipment	Architectural & Ornamental Metal Work	Commercial, Ind. & Inst. Elec. Lighting Fixtures
Connectors for Electronic Applications	Bolts, Nuts, Screws, Rivets & Washers	Current-Carrying Wiring Devices
Electric Lamps	Crowns & Closures	Electric Housewares & Fans
Electron Tubes	Cutlery	Electric Lamps
Electronic Capacitors	Fabricated Metal Products	Farm Freezers
Electronic Coils & Transformers	Fabricated Pipe & Fabricated Pipe Fittings	Household Appliances
Electronic Components	Fabricated Plate Work (Boiler Shops)	Household Cooking Equipment
Radio & TV Communications Equipment	Fabricated Structural Metal	Household Refrig. & Home & Farm Freezers
Telephone & Telegraph Apparatus	Fasteners, Buttons, Needles & Pins	Household Laundry Equipment
	Fluid Power Valves & Hose Fittings	
	Hand & Edge Tools	
	Hand Saws & Saw Blades	Household Vacuum Cleaners
	Hardware	Lighting Equipment
	Heating Equipment, Except Electric	Noncurrent-Carrying Wiring Devices
	Industrial Furnaces & Ovens	Radio & Television Repair Shops
	Iron & Steel Forgings	Radio & Television Sets Except Commn. Types
	Machine Tool Accessories & Measuring Devices	Refrig. & Air Cond. Serv. & Repair Shops
	Machine Tools, Metal Cutting Types	Residential Electrical Lighting Fixtures
	Machine Tools, Metal Forming Types	
	Metal Shipping Barrels, Drums Kegs, Pails	
	Metal Stampings	
	Power Driven Hand Tools	
	Prefabricated Metal Buildings & Components	
	Screw Machine Products	
	Sheet Metal Work	
	Special Dies & Tools, Die Sets, Jigs, Etc	
	Steel Springs	
	Valves & Pipe Fittings	
	Wire Springs	

INSTRUMENTS	JOB SHOP	MOBILE INDUSTRIAL EQUIPMENT
Analytical Instruments	Perform Work on Products for Use In Any MP&M Sector But Owns Less Than 50% of the Products On-Site (*e.g.,* Electroplating, Plating, Polishing, Anodizing, and Coloring)	Construction Machinery & Equipment
Automatic Environmental Controls		Farm Machinery & Equipment
Coating, Engraving, & Allied Services		Garden Tractors & Lawn & Garden Equipment
Dental Equipment & Supplies		Hoist, Industrial Cranes & Monorails
Ophthalmic Goods		Industrial Trucks, Tractors, Trailers, Tanks & Tank Components
Fluid Meters & Counting Devices		Mining Machinery & Equipment, Except Oil Field
Instruments to Measure Electricity		
Laboratory Apparatus & Furniture Manufacturing Industries		
Measuring & Controlling Devices		
Optical Instruments & Lenses		
Orthopedic, Prosthetic, & Surgical Supplies		
Pens, Mechanical Pencils, & Parts		
Process Control Instruments		
Search & Navigation Equipment		
Surgical & Medical Instruments & Apparatus		
Watches, Clocks, Associated Devices & Parts		

MOTOR VEHICLE	OFFICE MACHINE	ORDNANCE
Auto Exhaust System Repair Shops	Calculating & Accounting Equipment	Ammunition
Automobile Dealers (new & used)	Computer Maintenance & Repair	Ordinance & Accessories
Auto. Dealers (Dunebuggy, Go-Cart, Snowmobile)	Computer Peripheral Equipment	Small Arms
Automovile Service (includes Diag. & Insp. Cntrs.)	Computer Related Services	Small Arms Ammunition
Automotive Equipment	Computer Rental & Leasing	
Automotive Glass Replacement Shops	Computer Storage Devices	
Automotive Repairs Shops	Computer Terminals	
Automotive Stampings	Electrical & Electronic Repair	
Automotive Transmission Repair Shops	Electronic Computers	
Carburetors, Pistons Rings, Valves	Office Machines	
Electrical Equipment for Motor	Photographic Equipment & Supplies	
General Automotive Repair Shops		
Mobile Homes		
Motor Vehicle & Automotive Bodies		
Motor Vehicle Parts & Accessories		
Motorcycle Dealers		
Motorcycles		

APPENDIX A TO PART 483—TYPICAL PRODUCTS IN METAL PRODUCTS & MACHINERY SECTORS—Continued

Passenger Car Leasing Recreational & Utility Trailer Dealers Taxicabs Top & Body Repair & Paint Shops Travel Trailers & Campers Vehicles Vehicular Lighting Equipment Welding Shops (includes Automotive)		
PRECIOUS METALS & JEWELRY	**PRINTED WIRING BOARD**	**RAILROAD**
Costume Jewelry Jewelers' Materials & Lapidary Work Jewelry, Precious Metal Musical Instruments Silverware, Plated Ware, & Stainless	Printed Circuit Boards Printed Circuit Boards for Television and Radio Wiring Boards	Line-Haul Railroads Railcars, Railway Systems Switching & Terminal Stations
SHIPS AND BOATS	**STATIONARY INDUSTRIAL EQUIPMENT**	**STEEL FORMING & FINISHING**
Boat Building & Repairing Deep Sea Domestic Transportation of Freight Deep Sea Passenger Transportation, Except by Ferry Freight Transportation on the Great Lakes Marinas Ship Building & Repairing Towing & Tugboat Service Water Passenger Transportation Ferries Water Transportation of Freight Water Transportation Services	Air & Gas Compressors Automatic Vending Machines Ball & Roller Bearings Blowers & Exhaust & Ventilation Fans Commercial Laundry Equipment Conveyors & Conveying Equipment Electric Industrial Apparatus Elevators & Moving Stairways Equipment Rental & Leasing Food Product Machinery Fluid Power Cylinders & Actuators Fluid Power Pumps & Motors General Industrial Machinery Heavy Construction Equipment Rental Industrial Machinery Industrial Patterns Industrial Process Furnaces & Ovens Internal Combustion Engines Measuring & Dispensing Pumps Mechanical Power Transmission Equipment Metal Working Machinery Motors & Generators Oil Field Machinery & Equipment Packaging Machinery Paper Industries Machinery Printing Trades Machinery & Equipment Pumps & Pumping Equipment Refrigeration & Air & Heating Equipment Relays & Industrial Controls Rolling Mill Machinery & Equipment Scales & Balances, Except Laboratory Service Industry Machines Special Industry Machinery Spped Changers, High Speed Drivers & Gears Steam, Gas, Hydraulic Turbines, Generator Units Switchgear & Switchboard Apparatus Textile Machinery Transformers Welding Apparatus	Cold-Finished Steel Bars Steel Pipe and Tubes Steel Wiredrawing and Steel Nails and Spikes Miscellaneous Fabricated Wire Products (*e.g.,* steel wire rope, cable, netting)
MISCELLANEOUS METAL PRODUCTS Miscellaneous Fabricated Wire Products Miscellaneous Metal Work Miscellaneous Repair Shops & Related Services Miscellaneous Transportation Equipment		

APPENDIX B TO PART 438—TOP POLLUTANTS LIST

Total organics parameter pollutants	CAS number	Nominal quantitation value (mg/L)
1. Acrolein	107–02–8	0.05
2. Benzoic acid	62–85–0	0.05
3. Carbon disulfide	75–15–0	0.01
4. Dibenzofuran	132–64–9	0.01
5. Dibenzothiophene	132–65–0	0.01
6. Isophorone	78–59–1	0.01
7. n-Hexadecane	544–76–3	0.01
8. n-Tetradecane	929–59–4	0.01
9. Aniline	62–53–3	0.01
10. Chloroform (trichloromethane)	67–66–3	0.01
11. Methylene chloride (dichloromethane)	75–09–2	0.01
12. Chloroethane (ethyl chloride)	75–00–3	0.05
13. 1,1-Dichloroethane	75–34–3	0.01

APPENDIX B TO PART 438—TOP POLLUTANTS LIST—Continued

Total organics parameter pollutants	CAS number	Nominal quantitation value (mg/L)
14. 1,1,1-Trichloroethane (methylchloroform)	71–55–6	0.01
15. Tetrachloroethene	127–18–4	0.01
16. 1,1-Dichloroethylene (vinylidene chloride)	75–35–4	0.01
17. Trichloroethylene	79–01–6	0.01
18. Biphenyl	92–52–4	0.01
19. p-Cymene	99–87–6	0.01
20. Ethylbenzene	100–41–4	0.01
21. Toluene	108–88–3	0.01
22. N-Nitrosodimethylamine	62–75–9	0.05
23. N-Nitrosodiphenylamine	86–30–6	0.02
24. Chlorobenzene	108–90–7	0.01
25. 2,6-Dinitrotoluene	606–20–2	0.01
26. Phenol	108–95–2	0.01
27. 4-Chloro-m-cresol (parachlorometacresol or 4-chloro-3-methylphenol)	59–50–7	0.01
28. 2,4-Dinitrophenol	51–28–5	0.05
29. 2,4-Dimethylphenol	105–67–9	0.01
30. 2-Nitrophenol (o-nitrophenol)	88–75–5	0.02
31. 4-Nitrophenol (p-nitrophenol)	100–02–7	0.05
32. Acenaphthene	83–32–9	0.01
33. Anthracene	120–12–7	0.01
34. 3,6-Dimethylphenanthrene	1576–67–6	0.01
35. Fluorene	86–73–7	0.01
36. Fluoranthene	206–44–0	0.01
37. 2-Isopropylnaphthalene	2027–17–0	0.01
38. 1-Methylfluorene	1730–37–6	0.01
39. 2-Methylnaphthalene	91–57–6	0.01
40. 1-Methylphenanthrene	832–69–9	0.01
41. Naphthalene	91–20–3	0.01
42. Phenanthrene	85–01–8	0.01
43. Pyrene	129–00–0	0.01
44. Benzyl butyl phthalate	85–68–7	0.01
45. Dimethyl phthalate	131–11–3	0.01
46. Di-n-butyl phthalate	84–74–2	0.01
47. Di-n-octyl phthalate	117–84–0	0.01
48. Bis(2-ethylhexyl) phthalate	117–81–7	0.01

PART 463—PLASTICS MOLDING AND FORMING POINT SOURCE CATEGORY

6. The authority citation for part 463 is revised to read as follows:

Authority: 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342 and 1361.

7. Section 463.1 is amended by revising paragraph (c) to read as follows:

§ 463.1 Applicability.

* * * * *

(c) Processes that coat a plastic material onto a substrate may fall within the Electroplating, Metal Finishing, or Metal Products and Machinery provisions of 40 CFR parts 413, 433, and 438, as applicable. These coating processes are excluded from the effluent limitations guidelines and standards for the electroplating, metal finishing, and metal products and machinery point source categories and are subject to the plastics molding and forming regulation in this part.

* * * * *

PART 464—METAL MOLDING AND CASTING POINT SOURCE CATEGORY

8. The authority citation for part 464 is revised to read as follows:

Authority: 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342 and 1361.

9. Section 464.02 is amended by revising the last sentence of paragraphs (a), (b), (c), and (d) to read as follows:

§ 464.02 General definitions.

(a) * * * Processing operations following the cooling of castings not covered under aluminum forming, except for grinding scrubber operations which are covered here, are covered under the electroplating, metal finishing, and metal products and machinery point source categories (40 CFR parts 413, 433, and 438), as applicable.

(b) * * * Except for grinding scrubber operations which are covered here, processing operations following the cooling of castings are covered under the electroplating, metal finishing, and metal products and machinery point source categories (40 CFR parts 413, 433, and 438), as applicable.

(c) * * * Except for grinding scrubber operations which are covered here, processing operations following the cooling of castings are covered under the electroplating, metal finishing, and metal products and machinery point source categories (40 CFR parts 413, 433, and 438), as applicable.

(d) * * * Processing operations following the cooling of castings not covered under nonferrous metals forming are covered under the electroplating, metal finishing, and metal products and machinery point source categories (40 CFR parts 413, 433, and 438), as applicable.

* * * * *

PART 467—ALUMINUM FORMING POINT SOURCE CATEGORY

10. The authority citation for Part 467 is revised to read as follows:

Authority: 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342 and 1361.

11. Section 467.01 is amended by revising the fourth sentence of paragraph (a) to read as follows:

§ 467.01 Applicability.

(a) * * * For the purposes of this part, surface treatment of aluminum is considered to be an integral part of aluminum forming whenever it is performed at the same plant site at which aluminum is formed and such operations are not considered for regulation under the Electroplating, Metal Finishing, or Metal Products and

Machinery provisions of 40 CFR parts 413, 433, and 438, as applicable. * * * * * * * * * *

PART 471—NONFERROUS METAL FORMING AND METAL POWDERS POINT SOURCE CATEGORY

12. The authority citation for Part 471 is revised to read as follows:

Authority: 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342 and 1361.

13. Section 471.01 is amended by revising paragraph (c) to read as follows:

§ 471.01 Applicability.

* * * * *

(c) Surface treatment includes any chemical or electrochemical treatment applied to the surface of the metal. For the purposes of this regulation, surface treatment of metals is considered to be an integral part of the forming of metals whenever it is performed at the same plant site at which the metals are formed. Such surface treatment operations are not regulated under Electroplating, Metal Finishing, or Metal Products and Machinery Point Source Category regulations, 40 CFR parts 413, 433, and 438, respectively.

* * * * *

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