Federal Register

Wednesday,

January 3, 2001

Part III

Environmental Protection Agency

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

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

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.

Table of Contents

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