ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 469

[OW-FRL 2142-6]

Electrical and Electronic Components Point Source Category; Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed regulation.

SUMMARY: EPA is proposing regulations under the Clean Water Act to limit effluent discharges to waters of the United States and the introduction of pollutants into publicly owned treatment works (POTWs) from semiconductor and electronic crystals manufacturing facilities. The purpose of this proposal is to provide effluent limitations for "best practicable technology," "best available technology," and "best conventional technology," and to establish new source performance standards and pretreatment standards. After considering comments received in response to this proposal, EPA will promulgate a final rule.

The preamble discusses the legal authority and background, the technical and economic data bases, and other aspects of the proposed regulations. Abbreviations, acronyms, and other terms used in the preamble are defined in Appendix A.

These proposed regulations are supported by three major documents available from EPA. Analytical methods are discussed in *Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants.* EPA's technical conclusions are detailed in the *Development Document for Effluent Limitations Guidelines and Standards for the Electrical and Electronic Component Point Source Category.* The Agency's economic analysis is found in *Economic Impact Analysis of Effluent Limitations Guidelines and Standards for the Electrical and Electronic Components Point Source Category.*

DATE: Comments on this proposal must be submitted by October 25, 1982.

ADDRESS: Send comments to: Mr. David Pepson, Effluent Guidelines Division (WH-552), Environmental Protection Agency, 401 M St. SW., Washington, D.C. 20460, Attention: Electrical and Electronic Components Rules. The supporting information and all comments on this proposal will be available for inspection and copying at the EPA Public Information Reference Unit, Room 2402 (Rear) (EPA Library). The EPA public information regulation (40 CFR Part 2) provides that a reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Technical information and copies of technical documents may be obtained from the National Technical Information Service, Springfield, Virginia, 22161 (703/487-6000), or from Mr. David Pepson, at the address listed above. The economic analysis may be obtained from Ms. Renee Rico, Water Economics Branch (WH-586), Environmental Protection Agency, 401 M St. SW., Washington, D.C. 20460, or call (202) 426-2617.

SUPPLEMENTARY INFORMATION:

Organization of This Notice

I. Legal Authority

EPA is proposing the regulations described in this notice under the authority of Sections 301, 304, 306, 307, 308, and 501 of the Clean Water Act (the Federal Water Pollution Control Act Amendments of 1972, 33 USC 1251 *et seq.*, as amended by the Clean Water Act of 1977, P.L. 95-217) (the "Act"). These regulations also are proposed in response to the Settlement Agreement in *Natural Resources Defense Council, Inc. v. Train,* 8 ERC 2120 (D.D.C. 1976), modified, 12 ERC 1833 (D.D.C. 1979).

II. Background

A. The Clean Water Act

The Federal Water Pollution Control Act Amendments of 1972 established a comprehensive program to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters," Section 101(a).

- Section 301(b)(1)(A) set a deadline of July 1, 1977, for existing industrial direct dischargers to achieve "effluent limitations requiring the application of the best practicable control technology currently available" ("BPT").
- Section 301(b)(2)(A) set a deadline of July 1, 1983, for these dischargers to achieve "effluent limitations requiring the application of the best available technology economically achievable . . . which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants" ("BAT").
- Section 306 required that new industrial direct dischargers comply with new source performance standards ("NSPS"), based on best available demonstrated technology.
- Sections 307 (b) and (c) require pretreatment standards for new and existing dischargers to publicly owned treatment works ("POTW"). While the requirements for direct dischargers were to be incorporated into National Pollutant Discharge Elimination System (NPDES) permits issued under Section 402, the Act made pretreatment standards enforceable directly against dischargers to POTWs (indirect dischargers).
- Section 402(a)(1) of the 1972 Act does allow requirements for direct dischargers to be set case-by-case. However, Congress intended control requirements to be based for the most part on regulations promulgated by the Administrator of EPA.
- Section 304(b) required regulations that establish effluent limitations reflecting the ability of BPT and BAT to reduce effluent discharge.
- Sections 304(c) and 306 of the Act require regulations for NSPS.
- Sections 304(f), 307(b), and 307(c) require regulations for pretreatment standards.
- In addition to these regulations for designated industry categories, Section 307(a) required the Administrator to promulgate effluent standards applicable to all dischargers of toxic pollutants.
- Finally, Section 501(a) authorizes the Administrator to prescribe any

additional regulations "necessary to carry out his functions" under the Act.

The EPA was unable to promulgate many of these regulations by the deadlines contained in the Act, and as a result in 1976, EPA was sued by several environmental groups. In settling this lawsuit, EPA and the plaintiffs executed a "Settlement Agreement" which was approved by the Court. This agreement required EPA to develop a program and meet a schedule for controlling 65 "priority" pollutants and classes of pollutants. In carrying out this program EPA must promulgate BAT effluent limitations guidelines, pretreatment standards, and new source performance standards for 21 major industries. See *Natural Resources Defense Council, Inc.* v. *Train,* 8 ERC 2120 (D.D.C. 1976), modified, 12 ERC 1833 (D.D.C. 1979).

Several of the basic elements of the Settlement Agreement program were incorporated into the Clean Water Act of 1977. This law also makes several important changes in the Federal water pollution control program.

- Sections 301(b)(2)(A) and 301(b)(2)(C) of the Act now set July 1, 1984 as the deadline for industries to achieve effluent limitations requiring application of BAT for "toxic" pollutants. "Toxic" pollutants here includes the 65 "priority" pollutants and classes of pollutants which Congress declared "toxic" under Section 307(a) of the Act.
- Likewise, EPA's programs for new source performance standards and pretreatment standards are now aimed principally at controlling toxic pollutants.
- To strengthen the toxics control program, Section 304(e) of the Act authorizes the Administrator to prescribe certain "best management practices" ("BMPs"). These BMPs are to prevent the release of toxic and hazardous pollutants from: (1) Plant site runoff, (2) spillage or leaks, (3) sludge or waste disposal, and (4) drainage from raw material storage if any of those events are associated with, or ancillary to, the manufacturing or treatment process.

In keeping with its emphasis on toxic pollutants, the Clean Water Act of 1977 also revises the control program for non-toxic pollutants.

- For "conventional" pollutants identified under Section 304(a)(4) (including biochemical oxygen demand, suspended solids, fecal coliform and pH), the new Section 301(b)(2)(E) requires "effluent limitations requiring the application of the best conventional pollutant control technology" ("BCT")—instead of BAT—to be achieved by July 1, 1984. The factors considered in assessing BCT for an industry include the relationship between the cost of attaining a reduction in effluents and the effluents reduction benefits attained, and a comparison of the cost and level of reduction of such pollutants by publicly owned treatment works and industrial sources.

For those pollutants which are neither "toxic" pollutants or "conventional" pollutants, Sections 301(b)(2)(A) and (b)(2)(F) require achievement of BAT effluent limitations within three years after their establishment or by July 1, 1984, whichever is later, but not later than July 1, 1987.

The purpose of this proposed regulation is to establish BPT, BAT, and BCT effluent limitations and NSPS, PSES, and PSNS effluent standards for the Electrical and Electronic Components Point Source Category.

B. General Criteria for Effluent Limitations

1. BPT Effluent Limitations. The factors considered in defining best practicable control technology currently available (BPT) include: (1) The total cost of applying the technology relative to the effluent reductions that result, (2) the age of equipment and facilities involved, (3) the processes used, (4) engineering aspects of the control technology, (5) process changes, (6) non-water-quality environmental impacts (including energy requirements), (7) and other factors, as the Administrator considers appropriate. In general, the BPT level represents the average of the best existing performances of plants within the industry of various ages, sizes, processes, or other common characteristics. When existing performance is uniformly inadequate, BPT may be transferred from a different subcategory or category. BPT focuses on end-of-process treatment rather than process changes or internal controls, except when these technologies are common industry practice.

The cost/benefit inquiry for BPT is a limited balancing, committed to EPA's discretion, which does not require the Agency to quantify benefits in monetary terms. See e.g., *American Iron and Steel Institute* v. *EPA,* 526 F.2d 1027 (3rd Cir. 1975). In balancing costs against the benefits of effluent reduction EPA considers the volume and nature of existing discharges, the volume and nature of discharges expected after application of BPT, the general environmental effects of the pollutants, and the cost and economic impacts of the required level of pollution control. 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. See *Weyerhaeuser Company* v. *Costle,* 590 F. 2d 1011 (D.C. Cir. 1978); *Appalachian Power Company et al.* v. *U.S.E.P.A.* (4th Cir., Feb. 8, 1972).

2. BAT Effluent Limitations. The factors considered in defining best available technology economically achievable (BAT) include the age of the equipment and facilities involved, the processes used, engineering aspects of the control technology, process changes, non-water-quality environmental impacts (including energy requirements), and the costs of applying such technology (Section 304(b)(2)(B)). At a minimum, the BAT level represents the best economically achievable performance of plants of various ages, sizes, processes, or other shared characteristics. As with BPT, uniformly inadequate performance within a category or subcategory may require transfer of BAT from a different subcategory or category. Unlike BPT, however, BAT may include process changes or internal controls, even when these technologies are not common industry practice.

The statutory assessment of BAT "considers" costs, but does not require a balancing of costs against effluent reduction benefits (see *Weyerhaeuser* v. *Costle, supra*). In developing the proposed BAT, however, EPA has given substantial weight to the reasonableness of costs. The Agency has considered the volume and nature of discharges, the volume and nature of discharges expected after application of BAT, the general environmental effects of the pollutants, and the costs and economic impacts of the required pollution control levels.

Despite this expanded consideration of costs, the primary factor for determining BAT is the effluent reduction capability of the control technology. The Clean Water Act of 1977 establishes the achievement of BAT as the principal national means of controlling toxic water pollution from direct discharging plants.

3. BCT Effluent Limitations. The 1977 Amendments added Section 301(b)(2)(E) to the Act establishing "best conventional pollutant control technology" (BCT) for discharges of conventional pollutants from existing industrial point sources. Conventional pollutants are those defined in Section 304(a)(4) [biochemical oxygen demand (BOD), total suspended solids (TSS), fecal coliform, and pH], and any additional pollutants defined by the

Administrator as "conventional" [oil and grease, 44 FR 44501, July 30, 1979].

BCT is not an additional limitation but replaces BAT for the control of conventional pollutants. In addition to other factors specified in section 304(b)(4)(B), the Act requires that BCT limitations be assessed in light of a two part "cost reasonableness" test, *American Paper Institute* v. *EPA*, 660 F.2d 954 (4th Cir. 1981). The first test compares the cost for private industry to reduce its conventional pollutants with the costs to publicly owned treatment works for similar levels of reduction in their discharge of these pollutants. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find that limitations are "reasonable" under both tests before establishing them as BCT. In no case may BCT be less stringent than BPT.

4. New Source Performance Standards. The basis for new source performance standards (NSPS) under Section 306 of the Act is the best available demonstrated technology. New plants have the opportunity to design the best and most efficient processes and wastewater treatment technologies. Therefore, Congress directed EPA to consider the best demonstrated process changes, in-plant controls, and end-of-process treatment technologies that reduce pollution to the maximum extent feasible.

5. Pretreatment Standards for Existing Sources. Section 307(b) of the Act requires EPA to promulgate pretreatment standards for existing sources (PSES), which industry must achieve within three years of promulgation. PSES are designed to prevent the discharge of pollutants which pass through, interfere with, or are otherwise incompatible with the operation of POTWs.

The legislative history of the 1977 Act indicates that pretreatment standards are to be technology-based, analogous to the best available technology for removal of toxic pollutants. The General Pretreatment Regulations which serve as the framework for the proposed pretreatment standards are in 40 CFR Part 403, 46 FR 9404 (January 28, 1981).

EPA has generally determined that there is pass through of pollutants if the percent of pollutants removed by a well-operated POTW achieving secondary treatment is less than the percent removal by the BAT model treatment system. A study of 40 well-operated POTWs with biological treatment and meeting secondary treatment criteria showed that metals are typically removed at rates varying from 20 to 70%. POTWs with only primary treatment have enen lower rates of removal. In contrast, BAT level treatment being proposed for this industry for arsenic can achieve removal in the area of 86% or more. Thus, it is evident that arsenic passes through POTWs. As for toxic organics, data from the same POTWs illustrates a wide range of removal, from 0 to greater than 99%, whereas BAT for this category removes 98% of all toxic organics. Thus POTW's have removal rates of toxic organics which are less effective than BAT.

6. Pretreatment Standards for New Sources. Section 307(c) of the Act requires EPA to promulgate pretreatment standards for new sources (PSNS) at the same time that it promulgates NSPS. These standards are intended to prevent the discharge of pollutants which pass through, interfere with or are otherwise incompatible with a POTW. New indirect dischargers, like new direct dischargers, have the opportunity to incorporate the best available demonstrated technologies—including process changes, in-plant controls, and end-of-process treatment technologies—and to select plant sites that ensure the treatment system will be adequately installed. Therefore, the Agency sets PSNS after considering the same criteria considered for NSPS. PSNS will have environmental benefits similar to NSPS.

C. Prior EPA Regulations

No regulations have ever been proposed or promulgated for the Electrical and Electronic Components Category.

III. Scope of this Rulemaking and Summary of Methodology

EPA first studied the Electrical and Electronic Components Point Source Category to determine whether differences in raw materials, final products, manufacturing processes, equipment, age and size of plants, water usage, wastewater constituents, or other factors required the development of separate effluent limitations and standards for different segments of the category. This involved a detailed analysis of wastewater discharge and treated effluent characteristics, including: (1) The sources and volume of water used, the processes employed, and the sources of pollutants and wastewaters in the plant; and, (2) the constituents of wastewaters, including toxic pollutants.

EPA also identified several distinct control and treatment technologies (both in-plant and end-of-pipe), including those with the potential for use in the Electrical and Electronic Components Point Source Category. The Agency analyzed both historical and newly generated data on the performance of these technologies, including their non-water quality environmental impacts on air quality, solid waste generation, and energy requirements.

The cost of each control and treatment technology was estimated from unit cost curves developed by applying standard engineering analysis to wastewater characteristics. EPA derived the unit process costs by applying model plant wastewater characteristics to the unit cost curve of each treatment process.

Consideration of these factors enabled EPA to characterize the various control and treatment technologies as BPT, BCT, BAT, PSES, PSNS, and NSPS. The proposed regulations, however, do not require the installation of any particular technology. Rather, they require achievement of effluent limitations representative of the proper operation of these technologies or equivalent technologies.

IV. Data Gathering Efforts

In 1979–1980, under the authority of Section 308 of the Act, the Agency contacted by letter and phone approximately 260 plants producing electrical and electronic components. One hundred and five responses were used in the two subcategories for which EPA is proposing regulations. Self-monitoring data from these responses and from other Agency sources were used.

EPA and its contractors visited 78 electrical and electronic components plants in order to gather additional information on costs, production details and pollution control systems. The Agency also collected information on treatment systems not currently used in the industry. In collecting this information, EPA surveyed literature, contacted waste treatment equipment manufacturers and observed applicable treatment systems used by other industries.

Data for the economic analysis were obtained from published information, inquiries to waste treatment equipment manufacturers, and personal contacts with industry.

In addition to the foregoing data sources, supplementary data were obtained from NPDES permit files in EPA regional offices and contacts with state pollution control offices.

V. Sampling and Analytical Program

The sampling and analysis program for this rulemaking concentrated on the toxic pollutants designated in the Clean Water Act. However, conventional and

non-conventional pollutants were also sampled and analyzed. Both inorganic toxic and organic toxic pollutants were sampled for in the wastes from this industry. The Agency has not promulgated analytical methods for many of the organic toxic pollutants under section 304(h) of the Act, although a number of these methods have been proposed (44 FR 69464, December 3, 1979; 44 FR 75028, December 18, 1979). Additional information on the development of sampling and analysis methods for toxic organic pollutants is contained in the preamble to the proposed regulations for the Leather Tanning Point Source Category, 44 FR 38749, July 2, 1979.

EPA checked for the presence and magnitude of 65 toxic pollutants and classes of pollutants (as listed in the NRDC Consent Decree) and a smaller group of conventional and non-conventional pollutants suspected to be present in this industry's wastewaters. Sampled plants were selected to be representative of the manufacturing processes, the prevalent mix of production among plants, and the current treatment technology in the industry. During the sampling program, EPA sampled 38 plants under all subcategories. Twenty of these 38 plants were sampled in the two subcategories to be regulated.

Wherever possible, each sample of an individual raw waste stream, a combined waste stream, or a treated effluent was collected by an automatic, time series compositor during sampling periods as long as 72 hours. Where automatic compositing was not possible, grab samples were taken and composited manually.

EPA used the analytical techniques described in *Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants,* revised in April 1977. A very similar method is found among those proposed on December 3, 1979.

VI. Industry Subcategorization and Description

The Electrical and Electronic Components Point Source Category (E&EC) is derived from the Standard Industrial Classification (SIC) Major Group 36, Electrical and Electronic Machinery, Equipment and Supplies. Many of the industries listed under this SIC code were never evaluated as part of the E&EC category because EPA initially concluded that the wastewater discharges from these industries were primarily associated with the Metal Finishing Category.

For industries included in the E&EC study, the Agency has considered whether different effluent limitations and standards are appropriate for different segments of the Electrical and Electronic Components Point Source Category. The Act requires EPA to consider a number of factors to determine a basis for subcategorization, if subcategorization is needed. These include: Raw materials, final products, manufacturing processes, geographical location, plant size and age, wastewater characteristics, non-water quality environmental impacts, treatment costs, energy costs, and solid waste generation.

After considering the above factors, the Agency concluded that product type was an appropriate basis for subcategorization. Product type determines both the raw and process material requirements and the number and type of manufacturing processes used. Plants manufacturing the same product were found to have similar wastewater characteristics. Other factors affected the wastewater characteristics, but were not significant enough in themselves to be used as the basis for subcategorization.

Using product type as a basis, the Agency established twenty-one (21) subcategories for the E&EC category. Seventeen (17) of these subcategories are being excluded from regulation under Paragraph 8 of the Settlement Agreement, EPA proposes to defer two for regulation in future rulemakings, and two are the subject of this proposed regulations, Semiconductors and Electronic Crystals. (See Sections IX and X for a discussion of subcategories being excluded or deferred).

The semiconductor subcategory is comprised of 257 facilities; seventy-seven (77) are direct dischargers and 180 are indirect dischargers. The major pollutants found in this subcategory are toxic organics and fluoride. The electronic crystal subcategory consists of six (6) direct dischargers and 64 indirect dischargers with the major pollutants being toxic organics, fluoride, and total suspended solids (TSS). Arsenic is also found in significant concentrations at plants manufacturing gallium or indium arsenide crystals. The Development Document provides further background on decisions concerning subcategorization and on the make-up of the regulated subcategories.

VII. Available Wastewater Control and Treatment Technology

A. Status of In-Place Technology

This section describes the status of in-place technology for the two subcategories to be regulated by this rulemaking; Semiconductors and Electronic Crystals.

Wastewater treatment techniques currently used in the semiconductor and electronic crystal industries include both in-process and end-of-pipe waste treatment. In-plant process waste treatment is designed to remove pollutants from contaminated manufacturing process wastewater at some point in the manufacturing process. End-of-pipe treatment is wastewater treatment at the point of discharge.

In process controls in widespread use in both subcategories include collection of spent solvents for resale or reuse and treatment or contract hauling of the concentrated fluoride waste stream. Contract hauling, in this instance, refers to the industry practice of contracting with a firm to collect and transport wastes for off-site disposal. A few plants in these subcategories practice recycle of the dilute acid rinse stream.

End-of-pipe controls consist primarily of neutralization which is practiced by all direct dischargers in both subcategories. One plant in the electronic crystal industry also uses end-of-pipe precipitation/clarification for control of arsenic and fluoride. Further, all six (6) direct dischargers in the electronic crystal subcategory have already installed end-of-type neutralization and precipitation/clarification for control of pH, TSS, and fluoride.

B. Control Treatment Options

EPA considered the following treatment and control options for wastewater discharges from facilities within the semiconductor and electronic crystals subcategories. These options do not, in all cases, apply to both subcategories.

Option 1—Neutralization for pH control and solvent management for control of toxic organics. Solvent management is not a treatment system, but rather an in-plant control which consists of minor piping modifications to collect used solvents for resale or contract disposal. Since the spent solvents would not be discharged into the wastewater, toxic organic limitations based on this control would be equivalent to the maximum concentration of toxic organics found in the discharge as a result of process wastewater contamination. Process wastewater is the only other source of toxic organics for these subcategories.

Option 2—Option 1 plus end-of-pipe precipitation/clarification for treatment of arsenic, fluoride, and total suspended solids (TSS).

Option 3—Option 1 plus in-plant treatment (precipitation/clarification) of the concentrated fluoride stream.

Option 4—Option 2 plus recycle of the treated effluent stream to reduce fluoride further.

Option 5—Option 2 plus filtration for reduction of fluoride, arsenic, and suspended solids.

Option 6—Option 5 plus carbon adsorption to reduce toxic organic concentrations further.

VIII. Selection of Treatment Options and Effluent Limitations

A. Semiconductors

The technology basis for each effluent limitation and standard for the Semiconductor Subcategory is presented below along with the rationale for selecting the specific treatment option. The technologies and wastewater characteristics are discussed in more detail in the Development Document for this rulemaking.

1. BPT. EPA is proposing BPT based on Option 1 which consists of neutralization and solvent management. Solvent management is widely practiced and compliance by the remaining facilities will reduce the amount of toxic organics presently being discharged by approximately 80,000 kilograms per year. For the approximately twenty-five percent (25%) of the facilities which do not already collect used solvents, compliance costs should be minimal because the solvents can be sold to reclaimers. Neutralization is practiced by all facilities subject to BPT and therefore facilities will not incur additional costs for compliance.

Toxic organics are being regulated as the total of all toxic organics found in the discharge at concentrations greater than 0.01 milligrams per liter. Toxic organics comprising the total are listed in Appendix A. The rationale for regulating toxic organics as a combined total is that many different solvents are used by the semiconductor subcategory and it would be very difficult, as well as costly, to collect sufficient data to limit the numerous individual toxic organic compounds resulting from the use of these solvents. As stated before, the limitation for total toxic organics (TTO) is based on the highest concentration of TTO found in the discharge from contaminated process wastewater.

The Agency is not proposing a 30 day average limitation for TTO. The proposed daily maximum limitation for TTO is based on solvent management which, unlike most treatment options, does not entail pollution control equipment and is therefore not subject to significant performance variations. Accordingly, there is no need to establish a 30 day average in addition to the daily maximum. Further EPA does not have sufficient data to establish a 30 day average limitation.

Since monitoring (i.e. periodic effluent sampling and analysis) for the numerous toxic organics comprising TTO could be very expensive, the Agency is proposing an alternative to the usual monitoring requirements. Facilities will be allowed to certify that spent solvents are not discharged into the wastewater, but rather are collected for contract disposal or for sale to reclaimers. *See* proposed 40 CFR 462.12 and 469.22. EPA invites comment on this approach and the certification language we are proposing.

Option 2 was not selected because, in the semiconductor subcategory, Option 3 can be substituted for and is also less expensive than Option 2. Fluoride in this industry is primarily generated from a particular process stream, hydrofluoric acid etching. Option 3 (in-plant treatment) treats the smaller volume, highly concentrated etching wastestream and eliminates the need for end-of-pipe treatment of all process wastewater (as in Option 2). Option 3 was not selected because it is more appropriately reserved for consideration under BAT. Options 4, 5, and 6 were not selected for the reasons provided under the BAT discussion.

2. BAT. For BAT, EPA is proposing limitations based on Option 3. This technology consists of neutralization and solvent management (Option 1) plus in-plant precipitation/clarification of the concentrated fluoride stream. These controls will result in greater pollutant removal than BPT by reducing the amount of fluoride presently being discharged by over 300,000 kilograms/year. Contract hauling of the concentrated fluoride stream is an acceptable alternative to treatment as a means of achieving compliance.

Option 4 (Option 1 plus end-of-pipe precipitation/clarification followed by recycle of the treated effluent) was not selected because very few facilities have been able to solve serious operational problems associated with recycling. Therefore Option 4 is not adequately demonstrated in this industry to serve as the basis of national limitations. However, facilities located in areas which experience water shortages are encouraged to investigate this technology option. Option 5 (Option 1 plus end-of-pipe precipitation/clarification followed by filtration) was not selected because it will only achieve a three (3) percent increase in fluoride reduction while at the same time significantly increasing treatment costs to the facilities. Option 6 (Option 5 plus carbon adsorption) was not selected because the vast majority of facilities practicing solvent management would not discharge treatable concentrations of toxic organics.

3. NSPS. For NSPS, the Agency is proposing limitations based on solvent management, neutralization, and precipitation/clarification of the concentrated fluoride stream (Options 1 and 3). These technologies are equivalent to BAT for control of toxic organics and fluoride, and BCT for control of pH. Other options were not selected because EPA has determined that they would not meet the statutory standard for NSPS. *See* the discussion of the technical problems presented under BAT.

4. BCT. For BCT, EPA is proposing to regulate pH based on the BPT technology since BPT achieves the maximum feasible control for pH. Since BPT is the minimal level of control required by law, no possible application of the BCT cost tests could result in BCT limitations lower than those proposed today. Accordingly, there is no need to wait until EPA revises the BCT methodology before proposing a BCT limitation for pH. There are no other conventional pollutants of concern in the semiconductor subcategory as discussed in Section IX.

5. PSES and PSNS. For PSES and PSNS, the Agency is proposing TTO (total toxic organics) limitations based on solvent management. Since biological treatment at POTWs does not achieve removal equivalent to BAT for TTO, pass through occurs. Accordingly, EPA is proposing PSES and PSNS based on technology equivalent to BPT/BAT for reduction of TTO. Solvent management is widely practiced by indirect dischargers and compliance by the remaining facilities will reduce present discharges of TTO by approximately 200,000 kilograms/year.

EPA is proposing to establish a July 1, 1984, compliance date for the above pretreatment standards. This date establishes the same lead time for compliance for both direct and indirect dischargers.

The Agency considered selecting Option 3 to control fluoride at the same levels as for BAT, but chose not to regulate fluoride for indirect dischargers. The Agency seeks comment on this decision.

B. Electronic Crystals

The technology basis for each effluent limitation and pretreatment standard for the Electronic Crystal Subcategory is presented below along with the rationale for selecting the specific

treatment option. The technologies and wastewater characteristics are discussed in more detail in the Development Document.

1. BPT. EPA is proposing BPT based on Option 2. This technology consists of Option 1 (solvent management and end-of-pipe neutralization) plus end-of-pipe precipitation/clarification. These technologies control pH, toxic organics, total suspended solids (TSS), fluoride, and arsenic. With the exception of solvent management which is practiced by approximately 75% of facilities, these treatment technologies have already been installed at all electronic crystal facilities subject to BPT. Therefore, since facilities can sell used solvents to reclaimers, compliance with BPT should result in minimal or no costs.

Arsenic is only being regulated at facilities which manufacture gallium or indium arsenide crystals. Total toxic organic limitations, rather than limitations on each toxic organic pollutant, will be set for the same reasons explained under BPT for the Semiconductor Subcategory.

Option 3 was not selected because this technology controls only one process stream, hydrofluoric acid etching, and, therefore, does not control the arsenic and TSS found in other wastestreams. Options 4, and 6 were not selected for reasons presented under BAT for the Semiconductor Subcategory. Option 5 was not selected for arsenic because the Agency has no data available to demonstrate that filtration will further reduce arsenic discharges. This option was also not selected for fluoride because, as previously stated under BAT for semiconductors, filtration would only reduce fluoride by three percent while significantly increasing the treatment costs to facilities.

2. BAT. For BAT, EPA is proposing limitations based on the BPT technology. Option 3 was not selected for the same reason presented above. Options 4, 5, and 6 were not chosen for reasons explained under BAT above.

3. BCT. For BCT, EPA is proposing to regulate pH and TSS based on the BPT technology. For pH, BPT is equal to BCT for the same reason discussed under the semiconductor subcategory. For TSS, the Agency considered the addition of filtration to BPT (Option 5), but rejected this technology option because of the minimal additional reduction of total suspended solids. Based on BPT, the average removal of TSS for each of the six (6) direct dischargers will be approximately 5400 kilograms per year. Filtration would only increase this amount by 100 kilograms per year (0.4 kg/day) or by less than two percent (2%). Since there is no other technology option which would remove significant amounts of TSS, EPA is setting BCT equal to BPT. Accordingly, there is no need to conduct the BCT cost test.

4. NSPS. For NSPS. EPA is proposing limitations based on solvent management, neutralization, and end-of-pipe precipitation/clarification. These technologies are equivalent to BAT for toxic pollutants plus fluoride, and are equivalent to BPT/BCT for conventional pollutants. Other options were not selected because, for reasons presented under BAT of the semiconductor and Electronic Crystals Subcategories, EPA has determined these options would not meet the statutory standard for NSPS.

5. PSES AND PSNS. Both TTO and arsenic will be removed to a greater extent by BAT than by biological treatment at POTWs. Therefore, PSES and PSNS are required to prevent pass through. For PSES and PSNS, EPA is proposing PSES and PSNS limitations based on solvent management, neutralization, and end-of-pipe precipitation/clarification (Option 2) for the facilities which manufacture gallium or indium arsenide crystals. For facilities which only manufacture other types of crystals, PSES and PSNS are based on solvent management (Option 1). Option 2 will assure control of arsenic in addition to control toxic organics.

Only three (3) facilities will need to install additional treatment for control of arsenic and the majority of facilities already practice solvent management. Facilities which do not presently collect used solvents should not experience significant compliance costs because the used solvents can be sold to reclaimers.

EPA is proposing to establish a July 1, 1984 compliance date for the above pretreatment standards. This date establishes the same lead time for compliance for both direct and indirect dischargers.

The Agency considered selecting Option 3 to control fluoride at the same levels as for BAT, but chose not to regulate fluoride for indirect discharges. The Agency seeks comment on this decision.

IX. Pollutants and Subcategories Not Regulated

A. Settlement Agreement

The Settlement Agreement contained provisions authorizing the exclusion from regulation, in certain circumstances, of toxic pollutants and industry categories and subcategories. These provisions have been rewritten in a Revised Settlement Agreement which was approved by the District Court for the District of Columbia on March 9, 1979, *NRDC* v. *Costle*, 12 ERC 1833.

Data supporting exclusion of the pollutants and subcategories identified below are presented in the Development Document for this rulemaking.

1. Exclusion of Pollutants. One hundred and two (102) toxic pollutants, listed in Appendix C, are being excluded from regualtion for both the semiconductor and elecronic crystal subcategories. The basis of exclusion for eighty-nine (89) of these pollutants is Paragraph 8(a)(iii) which allows exclusion for pollutants which are not detectable with state-of-the-art analytical methods. The basis of exclusion for another nine (9) of these pollutants is also provided by Paragraph 8(a)(iii) which allows exclusion of pollutants which are present in amounts too small to be effectively reduced. Four (4) toxic pollutants are being excluded from regulation because these pollutants are already subject to effluent limitations and standards being promulgated under the Metal Finishing Category. This is permitted by Paragraph 8(a)(i).

In addition to the exclusion of the one hundred two (102) pollutants for both subcategories, another toxic pollutant is being excluded for the semiconductor subcategory only. This pollutant is arsenic and is being excluded under Paragraph 8(a)(iii) because it was found in amounts too small to be effectively treated.

2. Exclusion of Subcategories. All subcategory exclusions are based on either paragraph 8(a)(i), previously described, or paragraph 8(a)(iv) of the Revised Settlement Agreement. Paragraph 8(a)(iv) permits exclusion of a category or subcategory where "the amount and the toxicity of each pollutant in the discharge does not justify developing national regulations * * *."

Subcategories being excluded under Paragraph 8(a)(iv) are as follows: Resistors, Dry Transformers, Fuel Cells, Magnetic Coatings, Mica Paper, Carbon and Graphite Products, Fluorescent Lamps, and Incandescent Lamps.

Subcategories being excluded because they are covered by the guidelines for the Metal Finishing Category are as follows: Switchgear, Resistance Heaters, Ferrite Electronic Parts, Insulated Wire and Cable, Fixed Capacitors, Fluid Filled Capacitors, Transformers (Fluid Filled), Insulated Devices—Plastics and Plastic Laminates, and the subcategory of Motors, Generators, and Alternators.

B. Conventional Pollutants

BOD, fecal coliform, and oil and grease are not being regulated for either subcategory because they were found at concentrations below treatability. Total suspended solids (TSS) is not being regulated in the case of semiconductors because it was found at an average concentration of 10 mg/l which is below treatability.

X. Subcategories Deferred

Two subcategories of the Electrical and Electronic Components Category are being deferred. These subcategories are Electron Tubes and Phosphorescent Coatings.

The information currently available to the Agency for these subcategories is insufficient not only to make a determination of the need for regulation, but also to accurately describe the wastewater characteristics. Preliminary data indicates that the major pollutants found in the discharges of Electron Tubes are cadmium, lead, and chromium. For Phosphorescent Coatings, preliminary data indicates that the major pollutants are lead and cadmium.

Both of the above subcategories are presently being studied by EPA.

XI. Financial Considerations

A. Costs and Economic Impacts

The Agency's economic impact assessment of this proposed regulation is presented in *Economic Analysis of Proposed Effluent Standards and Limitations for the Electrical and Electronic Components Category.* The analysis details the investment and annual costs for the two subcategories covered by the regulation—electronic crystals and semiconductors. The analysis also assesses the impact of effluent control costs in terms of profitability changes, plant closures, production changes, employment effects, and balance of trade effects.

EPA has identified 70 establishments in the electronic crystal subcategory and 257 plants in the semiconductor subcategory that are covered by this regulation. Total investment costs for the two subcategories are estimated to be $5.1 million with an annual cost of $3.3 million, including interest and depreciation. These costs are expressed in 1982 dollars, and were updated from 1979 dollars using the Construction Cost Index from the *Engineering News Record.* No plant closures or employment impacts are expected to occur as a result of this regulation. Each of the industry subcategories are discussed separately below.

Electronic Crystal Subcategory

All costs incurred by the electronic crystal subcategory arise from requirements of PSES. BPT, BCT, and BAT are expected to cause minimal additional costs because control technologies are already in place for all plants with the exception of a small number of plants which will need to control toxic organics. Control of toxic organics consists of minor piping modifications which allow facilities to collect used solvents. These solvents are typcially sold for reuse; therefore, any costs associated with their management tend to be equal to or less than the profit made by resale of the solvents. Further, as previously stated, most facilities (approximately seventy five percent) already practice solvent management.

Costs incurred by the PSES arise from treatment of arsenic resulting from processing operations. There are seven indirect dischargers that use arsenic in manufacturing crystals. Four of the seven plants already achieve the pretreatment standards and would incur no additional costs. Three plants must install additional treatment equipment. Investment costs for pollution control technologies are estimated to be $892 thousand with annual costs of $645 thousand. A plant specific analysis of these three establishments indicated that annual costs of compliance represent between 0.6% and 3.4% of the value of shipments. The economic analysis involved estimating return on sales, return on investment, and the ability to raise capital for the three plants. The profitabilities of the three plants may decline slightly as a result of the regulation, but any decline is not expected to cause plant closures or unemployment effects.

Regulations for new sources for all electronic crystal manufacturers are the same as those for existing sources. Thus, the required pollution control investment is not expected to discourage entry or result in a cost disadvantage relative to current manufacturers.

Semiconductors Subcategory

All costs to this subcategory will occur as a result of the BAT guidelines. Compliance with BPT, BCT, and PSES are expected to cause minimal additional costs because control technologies are already in place with the exception that a small number of plants will need to control toxic organics. As with the electronic crystals subcategory, the control of toxic organics is expected to result in minimal additional costs because most facilities already practice solvent management and because the solvents can be collected and sold for reuse. As stated previously, the profit made by resale of the solvents tends to be equal to or greater than the costs associated with solvent management.

There are an estimated 77 direct dischargers covered by the BAT fluoride control requirements. Twenty-five of these plants already have treatment in place or haul their fluoride waste to landfills. Investment and annual costs for the remaining 52 plants are estimated to be $4.2 million and $2.7 million respectively. Analysis of the post-compliance profitabilities of these plants indicates that there would be some minor profit reduction for all plants in the industry; however, no plant closures or unemployment effects are expected. The analyses also indicated that all of these costs would be absorbed by the industry, thereby causing no increases in the prices of semiconductor products.

Pollution control requirements for new sources are the same as for existing sources; thus, NSPS/PSNS are not expected to discourage entry or result in a cost disadvantage relative to current manufacturers.

XII. Executive Order 12291 and Regulatory Flexibility Analysis

Executive order 12291 requires EPA and other agencies to perform regulatory impacts analyses of major regulations. The primary purpose of the Executive Order (E.O.) is to ensure that regulatory agencies carefully evaluate the need for taking regulatory action. Major rules are those which impose a cost on the economy of $100 million a year or more or have certain other economic impacts. This regulation is not a major rule because its annualized cost of $3.3 million is less than $100 million and its meets none of the other criteria specified in paragraph (b) of the E.O.

Public Law 96–354 requires EPA to prepare an Initial Regulatory Flexibility Analysis for all proposed regulations that have a significant impact on a substantial number of small entities. This analysis may be done in conjunction with or as a part of any other analysis conducted by the Agency. The economic impact analysis described above indicates that there will not be a significant impact on any segment of the regulated population, large or small. Therefore, a formal regulatory flexibility analysis is not required.

XIII. Non-Water Quality Aspects of Pollution Control

The elimination or reduction of one form of pollution may aggravate other environmental problems. Sections 304(b)

and 306 of the Act require EPA to consider the non-water quality environmental impacts of these regulations including air and noise pollution, radiation, solid waste generation, and energy requirements.

Compliance with the proposed regulation will have no effect on air, noise, or radiation pollution and will only result in minimal solid waste generation and minimal increased energy usage. The amount of solid waste generated per year will be 7700 metric tons per year. Available information indicates that the solid waste generated will not be hazardous as defined in the Resource Conservation and Recovery Act (RCRA). Energy requirements associated with these regulations will be 100,000 kilowatt-hours per year or only 7.5 kilowatt-hours per day per facility.

Based on the above non-water quality impacts from these regulations, EPA has concluded that the proposed regulation best serves overall national environmental goals.

XIV. Upset and Bypass Provisions

A recurring issue is whether industry limitations and standards should include provisions that authorize noncompliance during "upsets" or "bypasses." An upset, sometimes called an "excursion," is unintentional noncompliance beyond the reasonable control of the permittee. EPA believes that upset provisions are necessary, because upsets will inevitably occur, even if the control equipment is properly operated. Because technology-based limitations can require only what technology can achieve, many claim that liability for upsets is improper. When confronted with this issue, courts have been divided on the questions of whether an explicit upset or excursion exemption is necessary or whether upset or excursion incidents may be handled through EPA's enforcement discretion. Compare *Marathon Oil Co.* v. *EPA*, 564 F. 2d 1253 (9th Cir. 1977) with *Weyerhaeuser* v. *Costle, supra* and *Corn Refiners Association, et al.* v. *Costle*, No. 78-1069 (8th Cir. April 2, 1979). See also *American Petroleum Institute* v. *EPA*, 540 F. 2d 1023 (10th Cir. 1976); *CPC International, Inc.* v. *Train*, 540 F. 2d 1320 (8th Cir. 1976); *FMC Corp.* v. *Train*, 539 F.2d 973 (4th Cir. 1976).

Unlike an upset—which is an unintentional episode—a bypass is an intentional noncompliance to circumvent waste treatment facilities during an emergency.

EPA has both upset and bypass provisions in NPDES permits, and the NPDES portions of the Consolidated Permit regulations include upset and bypass permit provision. See 40 CFR Part 122.60, 44 FR 32854, 32862-3 (June 7, 1979). The upset provision establishes an upset as an affirmative defense to prosecution for violation of technology-based effluent limitations. The bypass provision authorizes bypassing to prevent loss of life, personal injury, or severe property damage. Since permittees in the semiconductor and electronic crystal subcategories are entitled to the upset and bypass provisions in NPDES permits, this proposed regulation does not repeat these provisions. Upset provisions are also contained in the General Pretreatment regulation.

XV. Variances and Modifications

When the final regulation for a point source category is promulgated, subsequent Federal and State NPDES permits to direct dischargers must enforce the effluent standards. Also, the pretreatment limitations apply directly to indirect dischargers.

The only exception to the BPT effluent limitations is EPA's "fundamentally different factors" variance. See *E. I. duPont de Nemours and Co.* v. *Train, supra; Weyerhaeuser Co.* v. *Costle, supra.* This variance recognizes characteristics of a particular discharger in the category regulated that are fundamentally different from the characteristics considered in this rulemaking. This variance clause is included in the NPDES regulations and not in this proposed regulation. See 40 CFR Part 125.30.

Dischargers subject to the BAT limitations are also eligible for EPA's "fundamentally different factors" variance. Further, BAT limitations *for nonconventional pollutants* may be modified under Sections 301(c) and 301(g) of the Act. These statutory modifications do not apply to toxic or conventional pollutants.

The economic modification section (301)(c)) gives the Administrator authority to modify BAT requirements for non-conventional pollutants[1] for dischargers who file a permit application after July 1, 1977, upon a showing that such modified requirements will (1) represent the maximum use of technology within the economic capability of the owner or operator and (2) result in reasonable further progress toward the elimination of the discharge of pollutants. The environmental modification section (301(g)) allows the Administrator, with the concurrence of the State, to modify BAT limitations for non-conventional pollutants from any point source upon a showing by the owner or operator of such point source satisfactory to the Administrator that:

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

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

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

Section 301(j)(1)(B) of the Act requires that application for modifications under section 301(c) or (g) must be filed within 270 days after the promulgation of an applicable effluent guideline. Initial applications must be filed with the Regional Administrator and, in those States that participate in the NPDES program, a copy must be sent to the Director of the State program. Initial applications to comply with 301(j) must include the name of the permittee, the permit and outfall number, the applicable effluent guideline, and whether the permittee is applying for a 301(c) or 301(g) modification or both. Applicants interested in applying for both must do so in their initial application. For further details, see 43 FR 40859, September 13, 1978.

The non-conventional pollutant limited under BAT in this regulation is fluoride. No regulation establishing criteria for 301(c) and 301(g) determinations have been proposed or promulgated, but the Agency recently announced in the April 12, 1982, Regulatory Agenda plans to propose such regulations by December, 1982 (47 FR 15702). All dischargers who file an initial application within 270 days will be sent a copy of the substantive requirements for 301(c) and 301(g) determinations once they are promulgated. Modification determinations will be considered at the

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

time the NPDES permit is being reissued."

Indirect dischargers subject to PSES are eligible for the "fundamentally different factors" variance and for credits for toxic pollutants removed by POTW. See 40 CFR 403.7; 403.13; 46 FR 9404 (January 28, 1981). Indirect dischargers subject to PSNS are only eligible for the credits provided for in 40 CFR 403.7. New sources subject to NSPS are not eligible for EPA's "fundamentally different factors" variance or any statutory or regulatory modifications. See *E.I. duPont de Nemours* v. *Train, supra.*

XVI. Relation to NPDES Permits

The BPT, BAT and BCT limitations and NSPS in this regulation will be applied to individual plants through NPDES permits issued by EPA or approved State agencies under Section 402 of the Act. Under the proposed regulation for the Electrical and Electronic Components Category, all limitations are concentration based. National mass based limitations are not provided because the Agency has determined that a fundamental relationship between production and pollutant loadings does not exist for either subcategory. See 40 CFR 122.63(f). Permitting authorities can derive mass based limitations by multiplying the concentration limit by the undiluted discharge flow.

The preceding section of this preamble discussed the binding effect of this regulation on NPDES permits, except when variances and modifications are expressly authorized. The following adds more detail on the relation between this regulation and NPDES permits.

One subject that has received different judicial rulings is the scope of NPDES permit proceedings when effluent limitations and standards do not exist. Under current EPA regulations, States and EPA regions that issue NPDES permits before regulations are promulgated must do so on a case-by-case basis. This regulation provides a technical and legal base for new permits.

Another issue is how the regulation affects the authority of those that issue NPDES permits. EPA has developed the limitations and standards in this regulation to cover the typical facility for this point source category. In specific cases, the NPDES permitting authority may have to establish permit limits on toxic pollutants that are not covered by this regulation. This regulation does not restrict the power of any permit-issuing authority to comply with law or any EPA regulation, guideline, or policy. For example, if this regulation does not control a particular pollutant, the permit issuer may still limit the pollutant on a case-by-case basis, when such action conforms with the purposes of the Act. In addition, if State water quality standards or other provisions of State or Federal law require limits on pollutants not covered by this regulation (or require more stringent limits on covered pollutants), the permit-issuing authority *must* apply those limitations.

A final topic of concern is the operation of EPA's NPDES enforcement program, which was an important consideration in developing this regulation. The Agency emphasizes that although the Clean Water Act is a strict liability statute, EPA can initiate enforcement proceedings at its discretion (Sierra Club v. Train, 557 F. 2d 485, 5th Cir., 1977). EPA has exercised and intends to exercise that discretion in a manner that recognizes and promotes good-faith compliance and conserves enforcement resources for those who fail to make these good-faith efforts.

XVII. Solicitation of Comments

EPA invites and encourages public participation in this rulemaking. The Agency asks that comments address specific deficiencies in the record of this proposal and that suggested revisions or corrections be supported by data.

EPA particularly requests additional comments and information on the following issue: As part of the economic impact analysis for this rulemaking, the Agency has stated that facilities will incur minimal, if any, costs for complaince with the total toxic organics (TTO) limitation. The rationale for this statement is that: (1) Information shows that many facilities can sell spent solvents to reclaimers, and (2) the Agency is not requiring nonitoring where facilities certify that they are not dumping spent solvents.

EPA urges facilities to comment on the accuracy of the Agency's finding that compliance with the TTO limitation will have minimal, if any, economic impact on facilities.

We would also appreciate any available information and data regarding the occurrence of health and environmental problems associated with fluoride originating from direct dischargers in the semiconductor and/or electronic crystals industry.

The regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291.

List of Subjects in 40 CFR 469

Electrical and electronic products, Water pollution control, Waste treatment and disposal.

Dated August 11, 1982.

John W. Hernandez, Jr.,

Acting Administrator.

XVIII. List of Subjects in 40 CFR Part 469

Electrical and electronic equipment, Water pollution control, Waste treatment and disposal.

XIX. Appendixes

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

Act—The Clean Water Act.

Agency—The U.S. Environmental Protection Agency.

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

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

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

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

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

Direct Discharger—A facility which discharges or may discharge pollutants into waters of the United States.

Indirect Discharger—A facility which discharges or may discharge pollutants into a publicly owned treatment works.

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

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

POTW—Publicly owned treatment works.

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

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

RCRA—Resource Conservation and Recovery Act (Pub. L. 94-580) of 1976, Amendments to Solid Waste Disposal Act.

Appendix B.—List of Toxic Organics Comprising Total Toxic Organics (TTO)

1,2,4 trichlorobenzene
chloroform
1,2 dichlorobenzene
1,3 dichlorobenzene
1,4 dichlorobenzene
ethylbenzene
1,1,1 trichloroethane
methylene chloride
napthalene
2 nitrophenol
phenol
bis(2-ethylhexyl) phthalate
tetrachloroethylene
toluene
trichloroethylene
2 chlorophenol
2,4 dichlorophenol
4 nitrophenol
pentachlorophenol
di-n-butyl pthalate
anthracene
1,2 diphenylhydrazine
isophorone
butyl benzyl phthalate
1,1 dichloroethylene
2,4,6 trichlorophenol

Appendix C.—List of Pollutants Excluded From Regulation

The following nine (9) pollutants are being excluded under Paragraph 8(a)(iii) because they are present in amounts too small to be effectively reduced: antimony, beryllium, cadmium, mercury, selenium, silver, thallium, zinc, and cyanide.

The following four (4) pollutants are being excluded under Paragraph 8(a)(i) because they are already subject to effluent limitations and standards being promulgated under the Metal Finishing Category: lead, nickel, copper, and chromium.

The following eighty-nine pollutants are being excluded under Paragraph 8(a)(iii) because they were not detected in the effluent.

1 acenaphthene
2 acrolein
3 acrylonitrile
4 benzene
5 benzidine
6 carbon tetrachloride
7 chlorobenzene
8 hexachlorobenzene
9 1,2-dichloroethane
10 hexachloroethane
11 1,1-dichloroethane
12 1,1,2-trichloroethane
13 1,1,2,2-tetrachloroethane
14 chloroethane
15 bis(chloromethyl) ether
16 bis(2-chloroethyl) ether
17 2-chloroethylvinyl ether
18 2-chloronaphthalene
19 parachlorometa cresol
20 3,3'-dichlorobenzidine
21 1,2-trans-dichloroethylene
22 1,2-dichloropropane
23 1,2-dichloropropylene
24 2,4-dimethylphenol
25 2,4-dinitrotoluene
26 2,6-dinitrotoluene
27 fluorathene
28 4-chlorophenyl phenyl ether
29 4-bromophenyl phenyl ether
30 bis(2-chloroisopropyl) ether
31 bis(2-chloroethoxy) methane
32 methyl chloride
33 methyl bromide
34 bromoform
35 dichlorobromomethane
36 trichlorofluoromethane
37 dichlorodifluoromethane
38 chlorodibromomethane
39 hexachlorobutadiene
40 hexachlorocyclopentadiene
41 nitrobenzene
42 2,4-dinitrophenol
43 4,6-dinitro-o-cresol
44 N-nitrosodimethylamine
45 N-nitrosodiphenylamine
46 N-nitrosodi-n-propylamine
47 di-n-octyl phthalate
48 diethyl phthalate
49 dimethyl phthalate
50 benzo(a)anthracene
51 benzo(a)pyrene
52 3,4-benzofluorathene
53 benzo(k)fluoranthane
54 chrysene
55 acenaphthylene
56 benzo(ghi)perylene
57 fluorene
58 phenanthrene
59 dibenzo(a,h)anthracene
60 ideno(1,2,3-cd)pyrene
61 pyrene
62 2,3,4,8-tetrachlorodibenzo-p-dioxin
63 vinyl chloride
64 aldrin
65 dieldrin
66 chlordane
67 4,4'-DDT
68 4,4'-DDE
69 4,4'-DDD
70 a-endosulfan-Alpha
71 b-endosulfan-Beta
72 endosulfan sulfate
73 endrin
74 endrin aldehyde
75 heptachlor
76 heptachlor epoxide
77 a-BHC-Alpha
78 r-BHC-Beta
80 g-BHC-Delta
81 PCB-1242
82 PCB-1254
83 PCB-1221
84 PCB-1232
85 PCB-1248
86 PCB-1260
87 PCB-1016
88 toxaphene
89 asbestos

For the reasons stated above, EPA proposes to add Part 469 to 40 CFR, Chapter I as follows:

PART 469—ELECTRICAL AND ELECTRONIC COMPONENTS POINT SOURCE CATEGORY

Subpart A—Semiconductor Subcategory

Sec.

Subpart B—Electronic Crystals Subcategory

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

Subpart A—Semiconductor Subcategory

§ 469.10 Applicability.

(a) The provisions of this subpart are applicable to discharges resulting from the manufacture of semiconductors.

(b) The compliance deadline for the BAT fluoride limitation shall be 3 years from the date of promulgation. The compliance deadline for the BAT, BCT and PSES TTO and pH limitations and standards, where appropriate, shall be July 1, 1982.

§ 469.11 Specialized definitions.

The definitions in 40 CFR 401 and the chemical analysis methods in 40 CFR 136 apply to this subpart. In addition,

(a) The term "total toxic organics (TTO)" shall mean the sum of the concentrations for each of the following toxic organic compounds which is found in the discharge at a concentration greater than ten (10) micrograms per liter:

1,2,4 trichlorobenzene
chloroform
1,2 dichlorobenzene
1,3 dichlorobenzene
1,4 dichlorobenzene
ethylbenzene
1,1,1 trichloroethane
methylene chloride
napthalene
2 nitrophenol
phenol
bis(2-ethylhexyl) phthalate
tetrachloroethylene
toluene
trichloroethylene
2 chlorophenol
2,4 dichlorophenol
4 nitrophenol
pentachlorophenol
di-n-butyl pthalate
anthracene
1,2 diphenylhydrazine
isophorone
butyl benzyl phthalate
1,1 dichloroethylene
2,4,6 trichlorophenol

(b) The term "semiconductors" shall mean solid state electrical devices which perform functions such as processing and display, power handling, and interconversion between light enegy and electrical energy.

§ 469.12 Monitoring requirements.

(a) In lieu of monitoring for TTO, the permit authority may allow direct dischargers to include the following certification as a "comment" on the Discharge Monitoring Report required by § 122.62(i): "I certify that, since filing the last discharge monitoring report, toxic organic compounds have not entered the wastewater in quantities that will exceed the discharge limits for TTO". In requesting this alternative procedure, the discharger shall specify the toxic organic compounds used and the procedures used (e.g., sold to reclaimers) to prevent excessive wastewater discharge of toxic organics. If monitoring is necessary to measure compliance with the TTO standard, it may be limited to toxic organics likely to be present.

(b) In lieu of monitoring for TTO, the control authority may allow industrial users of POTWs to make the following certification as a comment to the periodic reports required by § 403.12(e): "I certify that, since filing the last periodic report, toxic organic compounds have not entered the water in quantities that will exceed the discharge limits for TTO". In requesting this alternative procedure, the discharger shall specify the toxic organic compounds used and the procedures used (e.g., sold to reclaimers) to prevent excessive wastewater discharge of toxic organics. If monitoring is necessary to measure compliance with the TTO standard, it may be limited to toxic organics likely to be present.

§ 469.13 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR Part 125.30–32 any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	
pH	([2])	([2])

[1] Total toxic organics.
[2] Within the range of 6.0 to 9.0.

§ 469.14 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR Part 125.30–32 any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	
Fluoride (T)	32.0	17.4

[1] Total toxic organics.

§ 469.15 Pretreatment standards for existing sources (PSES).

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

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	

[1] Total toxic organics.

§ 469.16 New source performance standards (NSPS).

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

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	
Fluoride (T)	32.0	17.4
pH	([2])	([2])

[1] Total toxic organics.
[2] Within the range of 6.0 to 9.0.

§ 469.17 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR Part 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must

comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	

[1] Total toxic organics.

§ 469.18 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollution control technology (BCT).

Except as provided in 40 CFR Part 125.30–32 any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollution control technology (BCT):

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Ph	(1)	(1)

[1] Within the range 6.0 to 9.0.

§ 469.20 Applicability.

(a) The provisions of this subpart are applicable to discharges resulting from the manufacture of electronic crystals.

(b) The compliance deadline for the BAT fluoride limitation shall be three years from the date of promulgation. The compliance date for the BAT and PSES, arsenic and TTO limitations and standards and the BCT limitation on TSS and pH is July 1, 1984.

§ 469.21 Specialized definitions.

The definitions in 40 CFR 401 and the chemical analysis methods in 40 CFR 136 apply to this subpart. In addition,

(a) The term "total toxic organics (TTO)" shall mean the sum of the concentrations for each of the following toxic organic compounds which is found in the discharge at a concentration greater than ten (10) micrograms per liter:

```
1,2,4  trichlorobenzene
       chloroform
  1,2  dichlorobenzene
  1,3  dichlorobenzene
  1,4  dichlorobenzene
       ethylbenzene
1,1,1  trichloroethane
       methylene chloride
       napthalene
    2  nitrophenol
       phenol
       bis(2-ethylhexyl) phthalate
       tetrachloroethylene
       toluene
       trichloroethylene
    2  chlorophenol
  2,4  dichlorophenol
    4  nitrophenol
       pentachlorophenol
       di-n-butyl pthalate
       anthracene
  1,2  diphenylhydrazine
       isophorone
       butyl benzyl phthalate
  1,1  dichloroethylene
2,4,6  trichlorophenol
```

(b) The term "electronic crystals" shall mean crystals or crystalline material which because of their unique structural and electronic properties are used in electronic devices. Examples of these crystals are quartz, ceramic, silicon, and gallium arsenide.

§ 469.22 Monitoring requirements.

(a) In lieu of monitoring for TTO, the permit authority may allow direct discharges to include the following certification as a "comment" on the Discharge Monitoring Report required by § 122.62 (i): "I certify that, since filing the last discharge monitoring report, toxic organic compounds have not entered the wastewater in quantities that will exceed the discharge limits for TTO. In requesting this alternative procedure, the discharger shall specify the toxic organic compounds used and the procedures used (e.g., contract hauling of spent solvents) to prevent excessive wastewater discharge of toxic organics. If monitoring is necessary to measure compliance with the TTO standard, it may be limited to toxic organics likely to be present.

(b) In lieu of monitoring for TTO, the control authority may allow industrial users of POTWs to make the following certification as a comment to the periodic reports required by § 403.12(e): "I certify that, since filing the last periodic report, toxic organic compounds have not entered the water in quantities that will exceed the discharge limits for TTO". In requesting this alternative procedure, the discharger shall specify the toxic organic compounds used and the procedures used (e.g., contract hauling of spent solvents) to prevent excessive wastewater discharge of toxic organics. If monitoring is necessary to measure compliance with the TTO standard, it may be limited to toxic organics likely to be present.

§ 469.23 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR Part 125.30–32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	
Arsenic (T) [2]	1.89	0.68
Fluoride (T)	32.0	17.4
TSS	61.0	23.0
pH	(3)	(3)

[1] Total toxic organics.
[2] The arsenic (T) limitation only applies to manufacturers of gallium or indium arsenide crystals.
[3] Within the range of 6.0 to 9.0.

469.24 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR Part 125.30–32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically available (BAT):

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	
Arsenic (T) [2]	1.89	0.68
Fluoride (T)	32.0	17.4

[1] Total toxic organics.
[2] The arsenic (T) limitation only applies to manufacturers of gallium or indium arsenide crystals.

469.25 Pretreatment standards for existing sources (PSES).

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

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	
Arsenic (T) [2]	1.89	0.68

[1]Total toxic organics.
[2]The arsenic (T) limitation only applies to manufacturers of gallium or indium arsenide crystals.

§ 469.26 New source performance standards (NSPS).

Any new source subject to this subpart must achive the following new source performance standards (NSPS):

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	
Arsenic (T) [2]	1.89	0.68
Fluoride (T)	32.0	17.4
TSS	61.0	23.0
pH	(3)	(3)

[1]Total toxic organics.
[2]The arsenic (T) limitation only applies to manufacturers of gallium or indium arsenide crystals.
[3]Within the range of 6.0 to 9.0.

§ 469.27 Pretreatment standards for new sources (PSNS).

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

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	0.47	
Arsenic (T) [2]	1.89	0.68

[1]Total toxic organics.
[2]The arsenic (T) limitation only applies to manufacturers of gallium or indium arsenide crystals.

§ 469.28 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollution control technology (BCT).

Except as provided in 40 CFR Part 125.30–32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollution control technology (BCT):

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TSS	61.0	23.0
pH	(1)	(1)

[1]Within the range of 6.0 to 9.0.

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