ENVIRONMENTAL PROTECTION AGENCY

[40 CFR Part 420]

IRON AND STEEL MANUFACTURING POINT SOURCE CATEGORY

Proposed Effluent Limitations Guidelines for Existing Sources and Pretreatment Standards for New Sources

Notice is hereby given that effluent limitations guidelines, standards of performance and pretreatment standards for new sources set forth in tentative form below are proposed by the Environmental Protection Agency (EPA) for the By-Product Coke, Beehive Coke, Sintering, Blast Furnace (Iron), Blast Furnace (Ferromanganese), Basic Oxygen Furnace (Semi Wet Air Pollution Control Methods), Basic Oxygen Furnace (Wet Air Pollution Control Methods), Open Hearth Furnace, Electric Arc Furnace (Semi Wet Air Pollution Control Methods), Electric Arc Furnace (Wet Air Pollution Control Methods), Vacuum Degassing, and Continuous Casting subcategories of the Iron and Steel Manufacturing Industry pursuant to sections 304(b), 306(b), and 307(c) of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, 1314, 1316(b) and 1317(c), 86 Stat. 816 et seq.; P.L. 92-500) (the "Act").

(a) *Legal authority*—(1) *Existing point sources.* Section 301(b) of the Act requires the achievement by not later than July 1, 1977, of effluent limitations for point sources, other than publicly owned treatment works, which require the application of the best practicable control technology currently available as defined by the Administrator pursuant to section 304(b) of the Act. Section 301(b) also requires the achievement by not later than July 1, 1983, of effluent limitations for point sources, other than publicly owned treatment works which require the application of best available technology economically achievable which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 304(b) to the Act.

Section 304(b) of the Act requires the Administrator to publish regulations providing guidelines for effluent limitations setting forth the degree of effluent reduction attainable through the application of the best practicable control technology currently available and the degree of effluent reduction attainable through the application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods and other alternatives. The regulations proposed herein set forth effluent limitations guidelines, pursuant to section 304(b) of the Act, for the By-Product Coke, Beehive Coke, Sintering, Blast Furnace (Iron), Blast Furnace (Ferromanganese), Basic Oxygen Furnace (Semi Wet Air Pollution. Control Methods), Basic Oxygen Furnace (Wet Air Pollution Control Methods), Open Hearth Furnace, Electric Arc Furnace (Semi Wet Air Pollution Control Methods), Electric Arc Furnace (Wet Air Pollution Control Methods), Vacuum Degassing, and Continuous Casting subcategories of the Iron and Steel Manufacturing point source category.

(2) *New sources.* Section 306 of the Act requires the achievement by new sources of a Federal standard of performance providing for the control of the discharge of pollutants which reflects the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.

Section 306(b)(1)(A) of the Act requires the Administrator to propose regulations establishing Federal standards of performances for categories of new sources included in a list published pursuant to section 306(b)(1)(A) of the Act. The Administrator published in the FEDERAL REGISTER of January 16, 1973, (38 FR 1624) a list of 27 source categories, including the Iron and Steel Manufacturing source category. The regulations proposed herein set forth the Standards of performance applicable to new sources within the By-Product Coke, Beehive Coke, Sintering, Blast Furnace (Iron), Blast Furnace (Ferromanganese), Basic Oxygen Furnace (Semi Wet Air Pollution Control Methods), Basic Oxygen Furnace (Wet Air Pollution Control Methods), Open Hearth Furnace, Electric Arc Furnace (Semi Wet Air Pollution Control Methods), Electric Arc Furnace (Wet Air Pollution Control Methods), Vacuum Degassing, and Continuous Casting subcategorys of the Iron and Steel Manufacturing source category.

Section 307(c) of the Act requires the Administrator to promulgate pretreatment standards for new sources at the same time that standards of performance for new sources are promulgated pursuant to section 306. Sections 420.15, 420.25, 420.35, 420.45, 420.55, 420.65, 420.75, 420.85, 420.95, 420.105, 420.115, and 420.125 proposed below provides pretreatment standards for new sources within the by-product coke subcategory (Subpart A), beehive coke subcategory (Subpart B), sintering subcategory (Subpart C), blast furnace (iron) subcategory (Subpart D), blast furnace (ferromanganese) subcategory (Subpart E), basic oxygen furnace (semi wet air pollution control methods) subcategory (Subpart F), basic oxygen furnace (wet air pollution control methods) subcategory (Subpart G), open hearth furnace subcategory (Subpart H), electric arc furnace (semi wet air pollution control methods) subcategory (Subpart I), electric arc furnace (wet air pollution control methods) subcategory (Subpart J), vacuum degassing subcategory (Subpart K), and continuous casting subcategory (Subpart L), of the iron and steel manufacturing category.

Section 304(c) of the Act requires the Administrator to issue to the States and appropriate water pollution control agencies information on the processes, procedures or operating methods which result in the elimination or reduction of the discharge of pollutants to implement standards of performance under section 306 of the Act. The report referred to below provides, pursuant to section 304(c) of the Act, preliminary information on such processes, procedures or operating methods.

(b) *Summary and basis of proposed effluent limitations guidelines, standards of performance and pretreatment standards for new Sources.*—(1) General methodology. The effluent limitations guidelines and standards of performance proposed herein were developed in the following manner. The point source category was first studied for the purpose of determining whether separate limitations and standards are appropriate for different segments within the category. This analysis included a determination of whether differences in raw material used, product produced, manufacturing process employed, age, size, waste water constituents and other factors require development of separate limitations and standards for different segments of the point source category. The raw waste characteristics for each such segment were then identified. This included an analysis of (1) the source, flow and volume of water used in the process employed and the sources of waste and waste waters in the plant; and (2) the constituents of all waste water. The constituents of the waste waters which should be subject to effluent limitations guidelines and standards of performance were identified.

The control and treatment technologies existing within each segment was identified. This included an identification of each distinct control and treatment technology, including both in-plant and end-of-process technologies, which are existent or capable of being designed for each segment. It also included an identification of, in terms of the amount of constituents and chemical, physical, and biological characteristics of pollutants, the effluent level resulting from the application of each of the technologies. The problems, limitations and reliability of each treatment and control technology were also identified. In addition, the nonwater quality environmental impact, such as the effects of the application of such technologies upon other pollution problems, including air, solid waste, noise and radiation were identified. The energy requirements of each control and treatment technology were determined as well as the cost of the application of such technologies.

The information, as outlined above, was then evaluated in order to determine what levels of technology constitute the "best practicable control technology currently available," the "best available technology economically achievable" and the "best available demonstrated control technology, processes, operating methods, or other alternatives." In iden-

tifying such technologies, various factors were considered. These included the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, nonwater quality environmental impact (including energy requirements) and other factors.

The data on which the above analysis was performed included EPA permit applications, EPA sampling and inspections, consultant reports, and industry submissions.

The pretreatment standards proposed herein are intended to be complimentary to the pretreatment standard proposed for existing sources under Part 128 of 40 CFR. The basis for such standards is set forth in the FEDERAL REGISTER of July 19, 1973, 38 FR 19236. The provisions of Part 128 are equally applicable to sources which would constitute "new sources," under section 306 if they were to discharge pollutants directly to navigable waters except for § 128.133. That section provides a pretreatment standard for "incompatible pollutants" which requires application of the "best practicable control technology currently available," subject to an adjustment for amount of pollutants removed by the publicly owned treatment works. Since the pretreatment standards proposed herein apply to new sources, §§ 420.15, 420.25, 420.35, 420.45, 420.55, 420.65, 420.75, 420.85, 420.95, 420.105, 420.115 and 420.125 below amend § 128.133 to require application of the standard of performance for new sources rather than the "best practicable" standard applicable to existing sources under sections 301 and 304(b) of the Act.

(2) Summary of conclusions with respect to the byproduct coke subcategory (Subpart A), the beehive coke subcategory (Subpart B), sintering subcategory (Subpart C), blast furnace (iron) subcategory (Subpart D), blast furnace (ferromanganese) subcategory (Subpart E), basic oxygen furnace (semi wet air pollution control methods) subcategory (Subpart F), basic oxygen furnace (wet air pollution control methods) subcategory (Subpart G), open hearth furnace subcategory (Subpart H), electric arc furnace (semi wet air pollution control methods) subcategory (Subpart I), electric arc furnace (wet air pollution control methods) subcategory (Subpart J), vacuum degassing subcategory (Subpart K), continuous casting subcategory (Subpart L) of the iron and steel manufacturing category of point sources.

(i) Subcategorization. An evaluation of the raw steel making operations was necessary to determine whether or not subcategorization would be required in order to prepare an effluent limitations guideline or guidelines which would be broadly applicable and yet representative and appropriate for the operations and conditions to be controlled.

With respect to identifying any relevant, discrete subcategories for the iron and steel industry, the following factors in addition to those listed under general methodology were considered in determining industry subcategories for the purpose of the application of effluent limitations guidelines and standards of performance: gas cleaning equipment; waste treatability; aqueous waste loads; and process water usage.

After considering all of these factors, it was concluded that the iron and steel industry is comprised of separate and distinct processes with enough variability in product and waste quantity or characteristics to require subcategorization. The individual processes, products, and the waste water constituents comprise the most significant factors in the subcategorization of this complex industry. The use of various gas cleaning methods, particularly in the steelmaking subcategories, lends itself to a further subdivision into wet, semi-wet and dry subcategories. Waste treatability in itself is of such magnitude that it is more reasonable to consider the waste treatment methods under the individual subcategories. Size and age of the plants has no direct bearing on the subcategorization. The processes and treatment systems are similar regardless of the age and size of the plant. In addition to the plant size, the geographical location of the plant along with the age of the plant and of the waste treatment plant were considered. It can be noted that neither the wastes nor the treatment will vary in respect to the age or size factor. Therefore, age and size in itself would not substantiate industry subcategorization along these lines.

The number and type of pollutant parameters of significance varies with the operation being conducted and the raw materials used. The waste volumes and waste loads also vary with the operation. In order to prepare effluent limitation that would adequately reflect these variations in significant parameters and waste volumes the industry was subcategorized primarily along operational lines, with permutations where necessary.

(1) Subpart A—By-Product Coke Subcategory. The by product coke segment of the iron and steel industry serves as a separate subcategory for the purpose of establishing effluent limitations guidelines and standards of performance. It differs from other iron and steel industry subcategories with respect to raw material used, products produced, waste water constituents, and waste treatment systems, and from another coke making subcategory because coke oven gas, light oil, ammonium sulfate and sodium phenolate are recovered, rather than allowed to escape to the atmosphere. Recovery of these by-products was profitable in times past, but now only the coke oven gas can be considered valuable since it can be consumed internally as fuel. Other by-products continue to be recovered as a contribution to pollution abatement, not as a commercially profitable enterprise. Factors such as age and size of plant were not considered relevant in the categorization of these plants, since neither the waste characteristics nor the treatments required will vary with respect to age or size.

(2) Subpart B—Beehive Coke Subcategory. The beehive coke segment of the iron and steel industry differs from other subcategories of that industry with respect to raw materials used, final products produced, process and waste treatment techniques and types of pollutants discharged. It also differs from the by-product coke subcategory in that no effort is made to recover volatile matter generated by the process, thus producing a generally undesirable level of air pollution in the few remaining areas where beehives operate.

(3) Subpart C—Sintering Subcategory. The sintering segment of the iron and steel industry serves as a separate subcategory for the purpose of establishing effluent limitations guidelines and standards of performance. It differs from other iron and steel industry subcategories with respect to raw materials used, products produced, waste water constituents and waste treatment systems.

(4) Subpart D—Blast Furnace (Iron) Subcategory. The blast furnace (iron) segment of the iron and steel industry differs from other subcategories of that industry with respect to raw materials used, final products produced, process and waste treatment techniques used and types of pollutants discharged. It also differs from the other blast furnace subcategory (ferromanganese) with respect to product produced and types of pollutants discharged.

(5) Subpart E—Blast Furnace (Ferromanganese) Subcategory. The blast furnace (ferromanganese) segment of the iron and steel industry differs from other subcategories of that industry with respect to raw materials used, final products produced, process and waste treatment techniques and types of pollutants discharged. It also differs from the other blast furnace subcategory (iron) in a need for higher operating temperatures for the ferromanganese manufacturing process, resulting in higher concentrations of certain pollutant parameters, notably cyanides, in the gas washer waters.

(6) Subpart F—Basic Oxygen Furnace (Semi-Wet Air Pollution Control Methods) Subcategory. The basic oxygen furnace (semi-wet) segment of the iron and steel industry serves as a separate subcategory for the purpose of establishing effluent limitations guidelines and standards of performance. It differs from other iron and steel industry subcategories with respect to raw materials used, products produced, waste water constituents, and waste control and treatment technology, and from the other basic oxygen furnace subcategory (wet) in the quantity of water used to condition furnace gases, and as a consequence, in the equipment required to adequately treat the waste waters generated. In the semi-wet process, a spark box or a spray chamber using slightly more spray water than can be evaporated is used to condition

gases for further cleaning, producing a highly contaminated but small volume of waste water.

(7) Subpart G—Basic Oxygen Furnace (Wet Air Pollution Control Methods) Subcategory. The basic oxygen furnace (wet) segment of the iron and steel industry serves as a separate subcategory for the purpose of establishing effluent limitations guidelines and standards of performance. It differs from other iron and steel industry subcategories with respect to raw materials used, products produced, waste water constituents, and waste control and treatment technology, and from the other basic oxygen furnace subcategory (semi-wet) in the quantity of water used to condition furnace gases, and as a consequence, in the equipment required to adequately treat the waste waters generated. In the wet process, high energy scrubbers or wet gas washers are used to cool and condition furnace gases, producing much larger volumes of moderately contaminated waste waters than are common to the semi-wet systems.

(8) Subpart H—Open Hearth Furnace Subcategory. The open hearth furnace segment of the iron and steel industry serves as a separate subcategory for the purpose of establishing effluent limitations guidelines and standards of performance. It differs from other iron and steel industry subcategories with respect to raw materials used, products produced, waste water constituents, and waste control and treatment technology.

(9) Subpart I—Electric Arc Furnace (Semi Wet Air Pollution Control Methods) Subcategory. The electric arc furnace (semi-wet) segment of the iron and steel industry serves as a separate subcategory for the purpose of establishing effluent limitations guidelines and standards of performance. It differs from other iron and steel industry subcategories with respect to raw materials used, products produced, waste water constituents, and waste control and treatment technology, and from the other electric arc furnace subcategory (wet) in the quantity of water used to condition furnace gases, and as a consequence, in the equipment required to adequately treat the waste waters. In the electric arc furnace (semi-wet) subcategory a spark box or a spray chamber using slightly more water than can be evaporated conditions the gases for further cleaning in a precipitator or baghouse. A small volume of contaminated waste water may be produced, depending on how much excess spray water is used.

(10) Subpart J—Electric Arc Furnace (Wet Air Pollution Control Methods) Subcategory. The electric arc furnace (wet) segment of the iron and steel industry serves as a separate subcategory for the purpose of establishing effluent limitations guidelines and standards of performance. It differs from other iron and steel industry subcategories with respect to raw materials used, products produced, waste water constituents, and waste control and treatment technology, and from the other electric arc furnace subcategory (semi-wet) in the quantity of water used to condition furnace gases, and as a consequence, in the equipment required to adequately treat the waste waters. In the wet process, high energy scrubbers or wet gas washers are used to cool and condition furnace gases, producing much larger volumes of contaminated waste water than in the semi-wet systems.

(11) Subpart K—Vacuum Degassing Subcategory. The vacuum degassing segment of the iron and steel industry serves as a separate subcategory for the purpose of establishing effluent limitations guidelines and standards of performance. It differs from other iron and steel industry subcategories with respect to raw materials used, products produced, waste water constituents, and waste control and treatment technology. The degassing operation removes hydrogen, carbon and oxygen as carbon monoxide, and any other volatile alloys from the steel, along with minute particles of iron oxide. These gases, together with exhausted steam from steam ejectors, are condensed by direct contact with cooling water, producing a contaminated waste water.

(12) Subpart L—Continuous Casting Subcategory. The continuous casting segment of the iron and steel industry serves as a separate subcategory for the purpose of establishing effluent limitations guidelines and standards of performance. It differs from other iron and steel industry subcategories with respect to raw materials used, products produced, waste water constituents, and waste control and treatment technology. Most of the water serving the continuous casting operations is mold and machine cooling water, which are both noncontact systems on closed recycle with no possibility of contamination. Dirty process waters originate from an open spray system.

(ii) Pollutant parameters, waste sources, control and treatment technology, treatment practices, best practicable, best available, and new source treatment technology, and costs. These topics are discussed for each of the subcategories established in the preceding section.

(1) Subpart A—By-Product Coke Subcategory. The known significant pollutants or constituents of waste water resulting from by-product coking subcategory includes ammonia, biochemical oxygen demand, cyanides, phenols, oils and greases, pH, sulfides, and suspended solids.

Major sources of liquid wastes from the by-product coke subcategory are excess ammonia liquor resulting from the condensation of moisture originally present in the raw coal before coking, wastes from the light oil recovery system, overflows from the final cooler recycle system, condensate from desulfurizers, effluents from barometric condensers, and indirect cooling water. Minor additional sources may include coke wharf drainage, quench water overflow and coal pile runoffs. The volume of liquid wastes generated by the coke making process varies widely depending upon the moisture and oxygen content of the coal used as raw material, the chemical recovery processes used, and the extent of water recirculation and reuse practiced. Well maintained plants operating with a normal amount of recirculation would be expected to have the following liquid water volumes from various steps in the process:

	Gal/ton of coke	L/kkg of coke
Ammonia liquor (treated in free and fixed stills)	25	101
Steam condensate	18	75
Benzol plant wastes	30	125
Blowdown from final cooler recycle	20	83
Condensate from desulfurizers (where used)	25	101
Barometric condenser effluent:		
(a) Once-through (BPCTCA)	82	342
(b) Recycle with blowdown (BATEA)	7	29

The control and treatment technologies which are available include in-plant control measures and techniques and end-of-process treatment techniques. In-plant control measures include reuse of certain waste waters via recycling or in a subsequent process. Available treatment methods include the former by-product recovery systems—ammonia stripping, dephenolization, and desulfurization, in addition to true waste treatment techniques such as chemical and biological oxidation, aeration, waste stabilization, neutralization, breakpoint chlorination, filtration, carbon adsorption and incineration via controlled combustion.

Various degrees of waste treatment are practiced throughout the by-product coke subcategory. Steam stripping of ammonia liquor is done by most plants, although only free ammonia is removed by the majority of operators. Phenol recovery or removal is accomplished by about half of the plants, using a vapor recirculation technique or a liquid solvent extraction technique for scrubbing phenols from water. One coke plant which practices no dephenolization in process treats its final effluent in an activated sludge lagoon containing bacterial cultures specifically acclimated to convert phenolic material into nontoxic products. Several coke plants located in large cities have provided sufficient pretreatment of by-product waste streams to render them acceptable for further treatment along with domestic wastes in municipally owned sewage treatment plants. A few plants recover no by-products other than coke oven gas, incinerating the total plant waste load in a carefully controlled combustion system producing no liquid effluents for discharge. Most operating plants currently practice various degrees of recycling. In particular, quench station wastes are necessarily recycled wherever contaminated waters are added to the system as make-up for water lost to evaporation during quenching. Additional effluent flow reductions are accomplished by closing up final cooler waste water systems, passing these discharges over cooling towers or through a spray pond for recycle. Other water pollution control technologies may be transferred from other industry categories to treat by-product

coke plant wastes. Oxidation using chlorine and its compounds has been applied to blast furnace waste waters, and in many chemical industry applications. Past attempts to utilize this technique on raw waste waters from coke making have been unsuccessful, but would be better applied as a polishing technique following removal of gross quantities of pollutant by more conventional methods. Certain chemical and refinery wastes which are similar to by-product coke plant wastes have proven amenable to treatment with activated carbon adsorption. The technique has been successfully applied to large flow volumes, and is potentially applicable to coke plant problems. Improved biological degradation systems show promise for eventually providing the largest reduction of pollutants for the least cost. Systems currently in use preferentially eliminate one or two of the significant pollutants while tolerating fairly high concentrations of other pollutants. Attempts are being made to develop biomasses which degrade these other parameters simultaneously in the same activated sludge unit, or alternately, to arrange a series of biological cultures for sequentially eliminating the various pollutants.

The best practicable control technology currently available for the coke making by-products operation subcategory of the iron and steel industry would include: ammonia removal via operation of a free and fixed leg ammonia still; dephenolization using solvent extraction; recycling of final cooler and benezol waste with blowdown dephenolization; neutralization; and sedimentation.

Use of this recommended technology hereafter called alternate I, would produce an effluent containing no more than 0.0015 kg/kkg (lb/1000 lb) phenols, 0.0912 kg/kkg (lb/1000 lb) ammonia, 0.0219 kg/kkg (lb/1000 lb) of total cyanide. (cyanide*T*) 0.195 kg/kkg (lb/1000 lb) BOD5, 0.0109 kg/kkg (lb/1000 lb) oils and greases, and 0.0365 kg/kkg (lb/1000 lb) suspended solids. The proposed effluent limitations (BPCTCA) are based on a total discharge flow equivalent to 730 l/kkg (87.5 gal/1000 lb) of coke produced, with an additional allowance of 104 l/kkg (12.5 gal/1000 lb) for plants using desulfurization units.

Another approach (alternate II) to the BPCTCA level would abandon the use of dephenolization and substitute single stage biological treatment for phenol removal; sulfide oxidation via aeration; and clarification instead of sedimentation, in addition to retaining the ammonia removal steps, the recycle system and the neutralization step. This alternate technology would yield an effluent comparable to the above in ammonia, BOD5 and flow rate and containing somewhat lower concentrations of phenol, cyanide, oil and grease, and suspended solids.

The best available technology economically achievable can also pursue either of the two alternates. Continuing as a physical/chemical treatment, alternate I would include all steps in alternate I above, plus recycle of all crystalizer effluent, sulfide oxidation via aeration, alkaline chlorination, break point chlorination, clarification and carbon adsorption. Alternate II would expand the single stage biological treatment system used to achieve BPCTCA levels by adding multi-stage bio-oxidation for cyanide and ammonia removal, denitrification, and filtration of the final effluent. Either of these two systems would produce an effluent for discharge which would contain no more than 0.0002 kg/kkg (lb/1000 lb) phenol, 0.0042 kg/kkg (lb/1000 lb) ammonia, 0.0001 kg/kkg (lb/1000 lb) of cyanides amenable to chlorination (cyanide*A*), 0.0083 kg/kkg (lb/1000 lb) of BOD5, 0.0001 kg/kkg (lb/1000 lb) of sulfide, 0.0042 kg/kkg (lb/1000 lb) oils and greases, and 0.0042 kg/kkg (lb/1000 lb) suspended solids. The proposed effluent limitations (BATEA) are based on a total discharge flow equivalent to 417 l/kkg (50 gal/1000 lb) of coke produced with an additional allowance of 104 l/kkg (12.5 gal/1000 lb) for plants producing effluents from desulfurization units.

The new source performance standard for the by-product coke subcategory of the iron and steel industry cannot be defined as no discharge of process waste water pollutants to navigable waters because the pyrolytic decomposition of coals actually generates moisture in the first step of the decomposition process. Provision must be made for the removal and treatment of 80 to 165 liters (19 to 42 gallons) of water (depending on the moisture and oxygen content of the coal used) produced per metric ton of coal coked. It is recommended that new source performance standards for this subcategory be the same as the best available technology economically achievable.

Since most existing plants currently operate or have available for use the equipment to achieve base levels of treatment, the incremental cost to provide the best practicable control technology currently available and the best available technology economically achievable for the "typical" 2414 kkg/day (2660 ton/day) plant would be $168,000 capital costs and $152,000 annual operating cost and $935,000 capital and $357,000 annual operating costs, respectively. An alternate technology leading to incineration of the total plant raw waste load eliminates many of the treatment steps, but an operating plant's cost data prorated to be equivalent to the "typical" plant shown above indicated a capital cost of $1,738,000 and an annual operating cost of $1,515,000.

(2) Subpart B—Beehive Coke Subcategory. The known significant constituents of beehive operation waste water contributing to pollution loads include ammonia, biochemical oxygen demand, cyanides, phenol, suspended solids and heat. While these parameters are similar to those for the by-products coke plants, quantities found in beehive waste waters are much lower, since the great bulk of the volatile components are allowed to escape to the atmosphere.

A properly regulated beehive operation will have very low flows, due to the need to regulate water usage to a minimum to prevent excess water in the working areas. Process water contacts the coke only during the quenching operation, carrying along fine particles of coke and dissolving certain residues from the product.

Control and treatment technologies include only in-plant measures, and are aimed at the total recycle of all liquid wastes as make-up to the quenching system. Two of the three plants surveyed achieve no discharge of pollutants from their operation. The remaining plant recovers fine solids in settling ponds while discharging quench waste water after one pass through the system.

The application of the best practicable control technology currently available for the beehive coke subcategory is shown to be no discharge of pollutants to the receiving streams. The waste waters generated are presently recycled by two of the three plants surveyed, presenting no problems from this practice. Increased costs are minor, and no increased space or material handling requirements are encountered.

Best available technology economically achievable is likewise shown to be no discharge of pollutants to the receiving streams, for the reasons cited above. Also, the new source performance standards applicable to beehive coke subcategory would logically be no discharge of pollutants to the receiving streams. The technology recommended is practiced by most existing plants, and should be required of any new plants.

Capital investments and annual waste water treatment operating costs for the beehive coke subcategory depend on the level of technology achieved. The plant practicing once-through waste treatment shows a capital investment of $4,000, and an average operating cost of $1.56 per 907 kkg (1000 tons) of coke produced. The two plants practicing total recycle of waste water have an average capital investment of $13,500 in waste treatment equipment, and have annual operating costs ranging from $2.93 to $20.70 per 907 kkg (1000 tons) of coke produced.

(3) Subpart C—Sintering Subcategory. The known significant pollutant properties or constituents of waste waters from sintering operations include suspended solids, oil and grease, sulfides, and fluorides.

Plants built in the 1950's are more likely to contain wet scrubbers than those sintering operations built more recently. The chief sources of pollutants in a wet system are suspended solids washed out of the process gases; oils and greases from mill scale which are vaporized during sintering, then scrubbed out of the gas; sulfides from coke fines; and fluorides from fluorspar and limestone found in flue dusts from steelmaking operations. All of these pollutants may vary in quantity, depending on the various blends of iron bearing dust and mill scale, coke fines and limestone which constitute a typical sinter burden.

Control and treatment technologies currently practiced in sintering operations using wet systems for dedusting

are of two basic types. About one-fifth of these sinter plants utilize once-through systems consisting of a clarifier-thickener (with or without polymer addition) and vacuum filtration. The majority of those plants using wet systems recycle their thickener overflows, either to the sintering operation alone, or as part of a larger blast furnace recycle system. All such plants blowdown a portion of the recycled waters to the receiving stream, usually without further treatment.

The anticipated removal of pollutant parameters for each successive level of treatment technology would be as follows:

Treatment level	Percent reduction from raw waste load			
	TSS	O&G	S	F
Once through thickener	99.5	92.5	67.5	----
Recycle—no treatment of blowdown	99.8	99.7	98.0	66.7
Recycle with treated blowdown	99.9	99.7	99.9	86.7

Note.—TSS, total suspended nonfilterable solids; O&G, oil and grease; S, sulfides; F, fluoride.

The best practicable control technology currently available for the sintering subcategory consists of a clarifier-thickener with polymer addition to the feed and vacuum filtration of the thickener underflow. Eighty-five percent of the thickener overflow would recycle, while the remaining fifteen percent would be treated to skim off oily matter. Expected effluents from this system would contain less than 0.0104 kg/kkg (lb/1000 lb) suspended solids, and 0.0021 kg/kkg (lb/1000 lb) oils and greases. The limitations for BPCTCA are also based on an effluent flow of 209 l/kkg (25 gal/1000 lb) of sinter.

The effluent reduction attainable through application of the best available technology economically achievable would subject the blowdown to lime treatment and sedimentation for fluoride reduction, aeration for sulfide removal, and neutralization with acid prior to discharge. A final effluent from this system would contain no more than 0.0052 kg/kkg (lb/1000 lb) suspended solids, 0.0021 kg/kkg (lb/1000 lb) oil and grease, 0.0042 kg/kkg (lb/1000 lb) F, and 0.00006 kg/kkg (lb/1000 lb) S. The limitations for BATEA are also based on an effluent flow of 209 l/kkg (25 gal/1000 lb) of sinter.

New source performance standards for the sintering operation subcategory of the iron and steel industry category are the same as those described as best available technology economically achievable. No further reduction in pollutant levels is proposed, and to reduce flows to less than 209 l/kkg (25 gal/1000 lb) of sinter in a wet dedusting operation is impractical at this time. Continued research in the technology of fabric type dust filters and baghouses has improved the dry dust-catching operation to the point where new point sources are not likely to require wet scrubbing of gas streams.

Typical cost of constructing and operating a base level of treatment for a sintering operation producing 2703 kkg (2,980 tons) of sinter product per day, and using a once-through system with a thickener and vacuum filtration is approximately $548,000 initial investment, plus $110,000 per year operating expenses. Upgrading this basic system to provide recycling with 15 percent blowdown and with blowdown treatment to BPCTCA limitations increases capital cost by $255,000 and operating expenses by $55,800 per year. Treatment of the blowdown flow to BATEA limitations leads to an increased capital cost of $294,000 over and above the BPCTCA level, and an annual operating expense of $69,000 more than the BPCTCA level operating costs.

Cost figures given above are derived from cost data for existing plants and other cost estimates for equipment, piping, instrumentation, foundations, structures, and electrical items related to pollution control measures. Land acquisition costs are not included, nor are site clearance, taxes, freight charges, or expansion of existing supporting utilities, all of which could add significantly to total costs.

(4) Subpart D—Blast Furnace (Iron) Subcategory. The known significant constituents of waste water generated by the blast furnace (iron) subcategory contributing to pollution loads includes suspended solids, cyanides, phenols, ammonia, sulfides, pH and fluoride.

Major sources of liquid wastes from the blast furnace (iron) subcategory are waters used for contact cooling of blast furnace gases, and the scrubbing waters used to wash blast furnace gas free of fine solid particles to allow its use as a fuel. Suspended solids in the waste waters originate with these fines from the gas, and quantities vary with furnace operation and the nature of the burden. Cyanides, phenols and ammonia originate in the coke charged to the furnace, especially if the coke was quenched with contaminated coke plant waste waters. Sulfides are produced as hydrogen sulfide gas due to the reducing atmosphere required by the process. Fluorides occur in the gas stream from the decomposition of the raw materials charged to the furnace, and are easily transferred to the gas washer waters. Blast furnace operations characteristically have high flow rates for plant process water. The plants visited during the survey ranged from 8,070 to 22,500 l/kkg (968 to 2,698 gal/1000 lb) of iron. Even larger volumes of indirect cooling water are used, but these do not contact the dirty process gas or liquid streams, and are discharged without treatment.

Control and treatment technologies which are available include in-plant control measures and end-of-process treatment techniques. In-plant control measures include reuse of waste waters via recycling or reuse in a subsequent gas cleaning step. Available treatment methods include thickening (with or without polymer addition) of gas washer waters with vacuum filtration of thickener underflows and recycle of thickener overflows; pH control; alkaline chlorination following lime addition; filtration; and carbon adsorption.

The range of treatment technology actually practiced by most of the existing point sources in the blast furnace (iron) subcategory begins with solids sedimentation in a thickener, and vacuum filtration of the dense slurry underflow. A polymer is usually added to enhance settling and dewatering characteristics. The thickener effluent is then recycled to the gas cleaning system in about 35 percent of the operating plants. Blowdown from the system is discharged untreated, except in a few installations, where treatment consists of alkaline chlorination, pH adjustment, mixed media filtration and cooling.

The degree of effluent reduction attainable by the application of the various levels of control and treatment technology are as follows:

Treatment level	Percent reduction of pollutant load					
	TSS	CNT	Phenol	NH_3	S	F
Once through	97	----	----	----	80	----
Recycle—no treatment of blowdown	99.9	76	87	60	99	74
Recycle—with treatment of blowdown	99.9	99.6	93.4	97	99.9	87

Note.—CNT, cyanide, total; NH_3, ammonia as nitrogen.

The best practicable control technology currently available for the blast furnace (iron) subcategory consists of a thickener with polymer addition and/or magnetic flocculation. Vacuum filtration is used to treat the thickener underflows and the thickener overflows may be recycled over a cooling tower with minimal blowdown. Neutralization of the recycled waste streams is normally required. Expected effluents from this system would contain less than 0.0260 kg/kkg (lb/1000 lb) suspended solids, 0.0078 kg/kkg (lb/1000 lb) cyanide$T$, 0.0021 kg/kkg (lb/1000 lb) phenol, and 0.0651 kg/kkg (lb/1000 lb) ammonia at a pH value of 6.0 to 9.0. The above loads are based on an effluent flow of 521 l/kkg (62.5 gal/1000 lb) of iron produced.

The best available control technology economically achievable for the blast furnace (iron) subcategory consists of all systems required to attain the BPCTCA limitations presented above, plus additional treatment of blowdown, including alkaline chlorination, neutralization, breakpoint chlorination, pressure filtration, and carbon adsorption. Expected effluents from this system would contain less than 0.0052 kg/kkg (lb/1000 lb) suspended solids, 0.00013 kg/kkg (lb/1000 lb) cyanide$A$, 0.00026 kg/kkg (lb/1000 lb) phenol, 0.0052 kg/kkg (lb/1000 lb) ammonia, 0.00016 kg/kkg (lb/1000

lb) sulfide and 0.0104 kg/kkg (lb/1000 lb) fluoride based on an effluent flow of 521 l/kkg (62.5 gal/1000 lb) of iron produced.

New source performance standards for the blast furnace (iron) subcategory are the same as the effluent limitations based on BATEA, as described above.

Capital investments for operating plants surveyed ranged from $250,000 to $3,650,000, depending on the number and capacity of the furnaces. A base level of water pollution control for a typical 2995 kkg/day (3300 ton/day) plant would require an initial investment of $2,030,000, plus an annual operating cost of $561,000. Addition of a recycle system and cooling equipment adds $1,477,000 to the capital cost and $297,000 per year to the operating expense. Treatment of the blowdown from this recycle system increases capital costs by another $413,000 and annual operating costs by $292,000.

(5) Subpart E—Blast Furnace (Ferromanganese) Subcategory. The known significant waste water constituents generated by the blast furnace (ferromanganese) subcategory include suspended solids, cyanides, phenols, ammonia, sulfides, pH and manganese.

The two main sources of liquid wastes are waters used for cooling of blast furnace gases, and waters used to scrub the gases free of fine solid particles to allow its use as fuel. Suspended solids in the waste waters originate with these fines, which are quite rich in manganese due to the specialized product produced in the ferromanganese operation. Cyanides, phenols and ammonia originate from the coke charged to the furnace. Higher furnace operating temperatures generate increased amounts of these volatile parameters relative to the blast furnace (iron) subcategory. Sulfides are produced as hydrogen sulfide gas due to the reducing atmosphere required by the process.

Control and treatment technologies which are available include in-plant control measures and end-of-process treatment techniques. Methods used must aim at reducing effluent flows to a minimum via tight recycling of process waters. A base level of treatment consists of a classifier/thickener with polymer addition and vacuum filtration of the underflows and recycle of the thickener overflows. Cooling towers are used to enable the recycle of cooling waters. Advanced levels of treatment could be attained using alkaline chlorination following lime adjustment; pH control; filtration; carbon adsorption; lime-soda softening and total recycling with no discharge of process waste water pollutants to navigable waters.

The range of treatment technology currently practiced by most of the existing blast furnace (ferromanganese) plants begins with solids sedimentation in a thickener, usually with polymer addition to enhance solids settling characteristics. Sludges from this system are not usually used in sintering plants and do present a solids disposal problem because they are fairly high in leachable toxic materials. Thickener overflows are recycled to the gas scrubbers by all operating plants. In some cases, cooling water is also recycled over cooling towers, with minor amounts blown down to the gas scrubber system. Additional treatment practices available include advanced treatment of blowdown flows using alkaline chlorination or bioxidation; neutralization; breakpoint chlorination; filtration; treatment of the blowdown via lime-soda softening techniques with the softened water then returned to the recycle system.

The degree of effluent reduction attainable by the application of the various levels of technology are as follows:

	Percent reduction of pollutant load					
	TSS	CN	Phenol	NH_3	S	Mn
(A)*	98	23	82	43	43	98
(B)*	99+	99	99	97	99	99+
(C)*	99+	99+	99+	99+	99+	99+

*See "costs" table following for description of the treatment technology.

Note.—Mn: manganese.

The best practicable control technology currently available for the blast furnace (ferromanganese) subcategory consists of a thickener with polymer addition and vacuum filtration of underflows to treat gas washer water; a recycle system carrying cooling water over a cooling tower with pH control of water, and minor blowdown flows to the gas washer system, and to discharge; tight recycle of the gas washer system thickener overflows with minimal blowdowns; and final pH adjustment. Expected effluents from this system would contain less than 0.1043 kg/kkg (lb/1000 lb) suspend solids, 0.0312 kg/kkg (lb/1000 lb) cyanide*T*, 0.0042 kg/kkg (lb/1000 lb) phenol, and 0.2086 kg/kkg (lb/1000 lb) ammonia. The above loads are based on an effluent flow of 1043 l/kkg (125 gal/1000 lb) of ferromanganese produced.

The best available control technology economically achievable for the blast furnace (ferromanganese) subcategory consists of the BPCTCA system described above, plus additional treatment of the blowdown via alkaline chlorination, neutralization, breakpoint chlorination, pressure filtration, and carbon adsorption. The effluent quality attainable should be 0.0104 kg/kkg (lb/1000 lb) suspended solids, 0.00026 kg/kkg (lb/1000 lb) cyanide*A*, 0.00052 kg/kkg (lb/1000 lb) phenol, 0.0104 kg/kkg (lb/1000 lb) ammonia, 0.00031 kg/kkg (lb/1000 lb) sulfide and 0.0052 kg/kkg (lb/1000 lb) manganese based on an effluent flow of 1043 l/kkg (125 gal/1000 lb) of ferromanganese produced.

New source performance standards for the blast furnace (ferromanganese) subcategory should be the same as those described as the best available technology economically achievable since further reduction of flow rates is impractical at this time.

The initial investment reported by the one blast furnace (ferromanganese) plant surveyed was $2,215,000 for waste water treatment, plus an annual operating expense of $811,900. Estimated costs for a typical ferromanganese plant producing 744 kkg/day (820 ton/day) of product and treating waste water at increasing levels of technology are as follows:

Technology level	Cumulative costs (1971 dollars)	
	Initial investment	Annual operating
(A) Scrubber recycled, cooler once through	963,000	333,000
(B) Scrubber and cooler recycled, blowdown untreated	2,650,000	656,000
(C) Scrubber and cooler recycled, blowdown treated	3,010,000	1,209,000

(6) Subpart F—Basic Oxygen Furnace (Semi-Wet Air Pollution Control Methods) Subcategory. The known significant pollutants or constituents of waste water generated by the basic oxyen furnace (semi-wet) subcategory are suspended solids and fluorides, both of which are scrubbed out of furnace gas streams during contact with process water streams.

Control and treatment technology currently practiced in industry normally consists of coagulation and sedimentation using polymers or magnetic flocculation; mechanical removal of sludge continuously; and tight recycle systems with no discharge of process waste water pollutants to navigable waters.

The degree of effluent reduction attainable by the application of the various levels of technology are as follows:

Technology level	Percent reduction of pollutant load	
	TSS	Fluoride
Thickening, once through	75	10
Thickening plus polymer, once through	80	13
Recycle—no discharge	100	100

Application of the best practicable control technology currently available for the basic oxygen furnace (semi-wet) subcategory results in no discharge of process waste water pollutants to navigable waters. This is attained in practice by use of a coagulation and sedimentation chamber with flocculant polymer addition; continuous drag-out of settled solids; and tight recycling of overflows back to the gas cleaning process, with fresh water make-up and no blowdown. The system is kept in balance by controlling water consumption to avoid excess flow rates which would overload the

treatment system, yet always insuring enough water to provide proper gas conditioning.

The attainable effluent reduction based on the application of the best available technology economically achievable is shown to be no discharge of process waste water pollutants to navigable waters, for the reasons cited above. Also, new source performance standards applicable to basic oxygen furnace (semi-wet) subcategory would logically be no discharge of process waste water pollutants to navigable waters. The technology recommended is currently practiced at a number of existing plants, and should be required of any new plants.

The initial investment for treatment facilities reported by the two semi-wet basic oxygen furnace plants surveyed were $400,000 and $1,108,000 with annual operating costs of $451,900 and $157,700 respectively. Estimated treatment costs for a typical plant in the basic oxygen furnace (semi-wet) subcategory producing 4426 kkg/day (4880 ton/day) of steel are:

Technology level	Cumulative costs (1971 dollars)	
	Initial investment	Annual operating
Thickening, once through	507,000	107,000
Thickening + polymer, once through	534,000	164,000
Recycle—no discharge	722,000	203,000

(7) Subpart G—Basic Oxygen Furnace (Wet Air Pollution Control Methods) Subcategory. The known significant pollutants or constituents of waste water generated by the basic oxygen furnace (wet) subcategory are suspended solids and fluorides, both of which are scrubbed out of furnace gas streams during contact with process water streams.

Current control and treatment technology practiced in industry includes coagulation and sedimentation, normally with flocculant polymer addition. Overflows from the thickeners are discharged once-through by some of the operating plants. Many of the basic oxygen furnace (wet) plants recycle their treated waters back to the process, allowing 5 to 25 percent of the recycled flows as blowdown to be discharged untreated. A few existing plants provide pH neutralization and filtration as treatments for their blowdown. Additional blowdown treatment for elimination of fluorides could be accomplished by the use of lime addition and/or activated alumina adsorption columns.

The effluent reduction attainable by the application of the various levels of technology are as follows:

Technology level	Percent reduction of pollutant load	
	TSS	Fluoride
Thickener, once through	96	----------
Thickener + polymer, once through	98	----------
Recycle with untreated blowdown	99.8	83
Recycle with treated blowdown	99.9	94

The best practicable control technology currently available for the basic oxygen furnace (wet) subcategory consists of a thickener with polymer addition to the feed and vacuum filtration of the thickener underflow. The bulk of the thickener overflow is recycled, while less than ten percent of this recycle flow is blown down without further treatment. Expected loads of suspended solids in the discharged effluent would be 0.0104 kg/kkg (lb/1000 lb), based on a blowdown rate of 209 l/kkg (25 gal/1000 lb) of steel.

The best available technology economically achievable includes all components of the treatment system described as best practicable control technology currently achievable, plus further treatment of the blowdown by lime precipitation of fluorides, followed by sedimentation and neutralization. Expected loads of suspended solids and fluorides in the discharged effluent would be 0.0052 and 0.0042 kg/kkg (lb/1000 lb) respectively, based on a blowdown rate of 209 l/kkg (25 gal/1000 lb) of steel produced.

New source performance standards applicable to the basic oxygen furnace (wet) subcategory of the iron and steel industry point source category are the same as the limitations based on best available technology economically achievable. Further reduction of flows in a wet dedusting system is not practical at this time.

The initial investment for treatment facilities reported by the three basic oxygen furnace operations surveyed ranged from $297,000 to $1,730,000 with annual operating expenses ranging from $42,300 to $371,300 respectively. Estimated costs for a typical plant in the basic oxygen furnace (wet) subcategory producing 6884 kkg/day (7590 ton/day) of steel are:

Technology level	Cumulative costs (1971 dollars)	
	Initial investment	Annual operating
Thickener, once through	1,389,000	402,000
Thickener + polymer, once through	1,336,000	539,000
Recycle with untreated blowdown	1,773,000	630,000
Recycle with treated blowdown	2,136,000	713,000

(8) Subpart H—Open Hearth Furnace Subcategory. The known significant pollutants or characteristics of process waste water generated by the open hearth furnace subcategory are suspended solids, fluorides, zinc, pH and nitrates. All of these contaminants are scrubbed out of furnace gas streams during contact with process water streams.

Base level control and treatment technology currently practiced by industry on the comparatively few (most open hearth dust collection systems are totally dry) open hearth furnace wet dedusting systems includes thickening of process waters and vacuum filtration of thickener underflows. Improvements to this once-through system consist of polymer addition and/or magnetic flocculation to Several open hearth plants have installed recycle systems to recirculate thickener overflows back to the gas cleaning system, blowing down a minor fraction of the total flow without treatment. Other technologies to further reduce pollutant loads, not currently practiced by open hearth operators, include lime treatment for zinc and fluorides reduction with sedimentation and neutralization of treated blowdowns. An advanced blowdown treatment could include activated alumina adsorption of fluorides and biological denitrification of nitrates.

The effluent reduction attainable by the application of the various levels of technology are as follows:

Technology level	Percent reduction of pollutant load			
	TSS	F	Zn	NO_3
Thickening—once through	96	-------	20	-------
Thicking + polymer—once through	97.5	-------	20	-------
Recycle—untreated blowdown	99.8	53	92	61
Recycle—treated blowdown	99.9	92	99.9	89

Note.—Zn, zinc; NO_3, nitrate ion.

The best practicable control technology currently available for the open hearth furnace subcategory of the iron and steel industry point source category consists of a thickener with polymer addition and vacuum filtration of the underflows from the thickener. The bulk of the overflows are recycled to the process following pH adjustment with lime, while 8 to 10 percent of the total recycle flow is discharged. Effluent loads from this system would be 0.0104 kg/kkg (lb/1000 lb) suspended solids based on a discharge flow of 209 l/kkg (25 gal/1000 lb) of steel produced.

The best available technology economically achievable includes all parts of the system described above as best practicable control technology currently achievable, plus lime precipitation of fluorides and biological denitrification of nitrates. Final effluent loads from this treatment technique would be 0.0052 kg/kkg (lb/1000 lb) suspended solids, 0.0042 kg/kkg (lb/1000 lb) fluorides, 0.0094 kg/kkg (lb/1000 lb) nitrates, and 0.0010 kg/kkg (lb/1000 lb) zinc, based on a discharge flow of 209 l/kkg (25 gal/1000 lb) of steel produced.

New source performance standards applicable to the open hearth furnace operations subcategory of the iron and steel industry category are the same as the limitations based on the application of best available technology economically achievable. Further reduction of flows from a wet open hearth furnace operation is not practical at this time.

The initial investment for waste water treatment facilities reported by the two wet open hearth plants surveyed were $974,000 and $1,925,000 with annual operating expenses of $267,300 and $418,800 respectively. Estimated costs for a typical open hearth furnace operation producing 6,712 kkg/day (7,400 ton/day) of steel and using the various levels of technology described above would be:

Technology level	Cumulative costs (1971 dollars)	
	Initial investment	Annual operating
Thickening, once through	892,000	212,000
Thickening + polymer, once through	919,000	258,000
Recycle, untreated blowdown	1,425,000	391,000
Recycle, treated blowdown	2,992,000	670,000

(9) Subpart I—Electric Arc Furnace (Semi-Wet Air Pollution Control Methods) Subcategory. The known significant pollutants or constituents of waste waters generated by the electric arc furnace (semi-wet) subcategory are suspended solids, zinc and fluorides, all of which are scrubbed out of furnace gas streams during contact with process water streams.

Current control and treatment technology practiced in semi-wet electric arc furnace operations consists of coagulation and sedimentation using polymers and/or magnetic flocculation, mechanical removal of sludges, and tight recycle systems with no discharge of pollutants to receiving streams. Both semi-wet plants surveyed were attaining no discharge of process waste water pollutants. The first recycles all process waters back to the spark box spray system and the second utilizes close control over the moisture addition system to produce no excess waste water from the spray system. Instead, a sludge of sufficient density to allow direct solids disposal is generated.

The best practicable control technology currently available and widely practiced in this industry consists of a tight recycle system with no blowdowns, utilizing a settling chamber with mechanical removal of solids, and polymer addition and/or magnetic flocculation to enhance settling of solids. An alternate technique would use a thickener, with vacuum filtration of thickener underflows. In either case, no discharge of pollutants to the stream would result.

The effluent reduction attainable by the application of the best available technology economically achievable is no discharge of process waste water pollutants to navigable waters, for the reasons cited above. Also, new source performance standards applicable to electric arc furnace (semi-wet) subcategory are no discharge of process waste water pollutants to navigable waters. The technology recommended is currently practiced at existing plants, and should be required of any new plants.

Initial investments and operating costs for the recycled spray water system were $341,000 and $70,000 respectively, while the costs for the controlled moisture addition systems were $133,000 and $22,700 respectively. Estimated costs for a typical operation in the electric arc furnace (semi-wet) subcategory producing 1487 kkg/day (1640 ton/day) of steel and treating waste waters by a total recycle technique with no discharge would be an initial investment (1971 dollars) of $616,000 and an annual operating cost of $136,000. One hundred percent reduction of water pollution loads is achieved by the typical plant, and is achieved by known operating plants.

(10) Subpart J—Electric Arc Furnace (Wet Air Pollution Control Methods) Subcategory. The known significant pollutants or constituents of waste water generated by the electric arc furnace (wet) subcategory are suspended solids, zinc and fluorides, all of which are scrubbed out of furnace gas streams on contact with process water streams.

Typical control and treatment technology practiced in industry includes classification and sedimentation using flocculant polymers. Overflows from the thickener are discharged once-through by a few plants. Most of the plants in the electric arc furnace (wet) subcategory recycle the bulk of their process waste waters, allowing a continuous blowdown of 10–25 percent to pass out of the system untreated. A few operating plants (10 percent of total production) do provide filtration and pH adjustment of blowdowns prior to discharge.

The effluent reductions attainable by the application of the above levels of technology are:

Technology	Percent reduction of pollutant load		
	TSS	Fluoride	Zinc
Thickener—once through	97	.....	29
Thickener + polymer—once through	93	.....	29
Recycle with untreated blowdown	99	22	99
Recycle with treated blowdown	99.8	79	99.9

The best practicable control technology currently available consists of a thickener with polymer addition to the feed and vacuum filtration of the thickener underflow. The bulk of the thickener overflow is recycled to the process, while 8 to 10 percent is discharged without further treatment. Expected concentrations of suspended solids in the discharged effluent are 0.0104 kg/kkg (lb/1000 lb) based on a blowdown rate of 209 l/kkg (25 gal/1000 lb) of steel.

The best available technology economically achievable includes all components of the treatment system described as best practicable control technology currently achievable, plus treatment of blowdown by lime precipitation of fluorides and zinc, clarification, and neutralization. Expected loads of suspended solids, zinc and fluorides in the discharged effluent are 0.0052, 0.0010, and 0.0042 kg/kkg (lb/1000 lb) respectively, based on a blowdown rate of 209 l/kkg (25 gal/1000 lb) of steel produced.

New source performance standards applicable to the electric arc furnace (wet) subcategory of the iron and steel industry category are the same as the limitations based on the application of the best available technology economically achievable. Further reduction of flows in a wet dedusting system is not practical at this time.

The two electric arc furnace (wet) plants visited during the survey reported initial waste water treatment investments of $3,275,000 and $1,250,000 with annual operating costs of $555,500 and $421,900. Estimated costs for a typical plant in the electric arc furnace (wet) subcategory producing 1650 kkg/day (1820 ton/day) of steel are as follows:

Technology level	Cumulative costs (1971 dollars)	
	Initial investment	Annual operating
Thickener—once through	434,000	112,000
Thickener plus polymer—once through	521,000	122,000
Recycle with untreated blowdown	716,000	162,000
Recycle with treated blowdown	1,002,000	222,000

(11) Subpart K—Vacuum Degassing Subcategory. The known significant pollutants or constituents of the waste water generated in the vacuum degassing operation are suspended solids, lead, nitrate, manganese and zinc, all of which are scrubbed out of the gases under vacuum by direct contact with process waters. Current control and treatment technology practiced in industry includes once-through sedimentation practiced by less than ten percent of the operations; recycle, usually over a cooling tower, with minimal blowdown practiced by approximately eighty percent of the industry; treatment of blowdown flows by filtration practiced by five to ten percent of the industry; and advanced treatment of blowdown, including biological denitrification where nitrogen blankets are used to prevent oxidation of degassed steel.

Effluent reductions attainable through the application of the various levels of technology are:

Technology level	Percent reduction of pollutant load				
	TSS	Pb	NO3	Mn	Zn
Sedimentation, once through	59	17	.....	25	33
Recycle, cooling tower, untreated blowdown	91	85	69	82	85
Recycle, cooling tower, treated blowdown	99.8	99.9+	80	99.5	99.7

The best practicable control technology currently available for vacuum degassing operations consists of sedimentation with recycle of solids to sinter; recycle and cooling of process waters over cooling towers; lime treatment to precipitate metals; and filtration of treated blowdown prior to discharge. Effluents from such a system would contain less than 0.0052 kg/kkg (lb/1000 lb) suspended solids based on a discharge flow rate of 104 l/kkg (12.5 gal/1000 lb) of steel degassed.

The best available technology economically achievable includes all components of the treatment system described above, plus additional lime treatment, clarification and filtration, along with denitrification by biological means if nitrate concentrations exceed 4 mg/l. Effluents from this system would contain less than 0.0026 kg/kkg (lb/1000 lb) suspended solids, 0.00005 kg/kkg (lb/1000 lb) lead, 0.0005 kg/kkg (lb/

1000 lb) manganese, 0.0005 kg/kkg (lb/1000 lb) zinc and 0.0047 kg/kkg (lb/1000 lb) nitrates, based on a discharge flow rate of 104 l/kkg (12.5 gal/1000 lb) of steel degassed.

New source performance standards applicable to the vacuum degassing operation subcategory of the iron and steel industry category are the same as the limitations based on the application of the best available technology economically achievable. Further reduction of flows is not practical at this time.

Actual costs of two vacuum degassing operation waste treatment systems surveyed were reported as $626,000 and $187,000 initial investment, with annual operating expenses of $136,900 and $78,200. Estimated costs for a typical vacuum degassing operation waste water treatment system at various levels of technology are listed below. The degassing operation processes 472 kkg/day (520 ton/day) of steel.

Technology level	Cumulative costs (1971 dollars)	
	Initial investment	Annual operating
Sedimentation—once through	260,000	46,000
Recycle, cooling tower, blowdown, no treatment	684,000	144,000
Recycle, cooling tower, blowdown treatment	991,000	229,000

(12) Subpart L—Continuous Casting Subcategory. The known significant pollutants or constituents of the spray system waste water from the continuous casting subcategory are suspended solids and oil and grease, both of which originate during contact with the sprayed water.

Current control and treatment technology encompasses three levels of treatment widely used. A few plants use only a once through system incorporating a scale pit with a drag-out conveyor for scale, and an oil skimmer for removal of floating oils. Additional control includes the use of a recycle system and passing scale pit overflows over a cooling tower and back to the spray system, with a minor portion going to blowdown untreated. Again, only ten to fifteen percent of the operating plants practice this technique. Most continuous casting operations also provide high flow, rapid and filtration, either for blowdowns from the system or, in many cases, to the entire recycling process water flow, yielding effluents and process waters of high quality. This has been established as the base level practice.

The effluent reduction attainable by the application of the various levels of technology are:

	Percent reduction of pollutant load	
	TSS	Oils and grease
Once—through	84	50
Recycle—no treatment of blowdown	99	97
Recycle—treatment of blowdown	99.9	99.6

The best practicable control technology currently available for continuous casting operations is used by the majority of plants. It consists of a sedimentation basin with continuous dragout of settled solids and an oil skimmer for floating oils, recycle loop utilizing cooling tower, and flat bed, sand, or mixed media filtration of the entire recycle flow, with minimal blowdown. Effluents from such a system should contain less than 0.0260 kg/kkg (lb/1000 lb) suspended solids and less than 0.0078 kg/kkg (lb/1000 lb) oils and greases, based on flows of 521 l/kkg (62.5 gal/1000 lb) of steel.

The best available technology economically achievable and new source performance standards applicable to continuous casting include all parts of the above system, plus an additional pressure filtration step to treat the blowdown stream. Effluents from this system would be expected to contain less than 0.0052 kg/kkg (lb/1000 lb) of either oils and grease or suspended solids, based on the same flow as above.

Actual costs of the two continuous casting operations surveyed were initial investments of $1,406,000 and $2,062,600, with annual operating costs of $307,700 and $870,100. Estimated costs for a typical 970 kkg/day (1070 ton/day) continuous casting operation at various levels of technology are:

Technology level	Cumulative costs (1971 dollars)	
	Initial investment	Annual operating
Once through	389,000	71,000
Recycle—no treatment of blowdown	1,981,000	390,000
Recycle—treatment of blowdown	2,080,000	417,000

(iii) Thirty day and daily maximums. The unit effluent load limitations were developed by determining the minimum unit effluent volumes that could be achieved by the application of good water use practices and by a determination of the residual pollutant concentrations that remain after the application of the appropriate treatment technologies. The product of these is the unit effluent load limitations proposed. The limitations thus developed represent values not to be exceeded by any thirty (30) consecutive days average. The maximum daily effluent loads per unit of production were established so as not to exceed these thirty consecutive days values by a factor of more than two. In the absence of sufficient performance data from the industry to establish these factors on a statistical basis, the factor of two was chosen in consideration of the operating variations allowed for in selecting the 30 consecutive days average limitations.

(iv) Nonwater quality aspects of water pollution control. Consideration has been given to the nonwater quality aspects of water pollution control. The increased use of recycle systems and stripping columns have the potential for increasing the loss of volatiles to the atmosphere. Recycle systems are so effective in reducing waste water volumes and hence waste loads to and from treatment systems and in reducing the size and cost of treatment systems that a tradeoff must be accepted. Recycle systems requiring the use of cooling towers have contributed significantly to reductions of effluent loads while contributing only minimally to air pollution problems. Stripper vapors have been successfully recovered as usable by-products or they can be routed to incinerators. Careful operation of either system can avoid or minimize air pollution problems.

Consideration has also been given to the solid waste aspects of water pollution controls. The processes for treating the waste waters from this industry produce considerable volumes of sludges. Much of this material is inert iron oxide which can be reused profitably. Other sludges not suitable for reuse must be disposed of to land fills since most of the sludge consists of chemical precipitates which could be little reduced by incineration. Being precipitates they are by nature relatively insoluble and nonhazardous substances requiring minimal custodial care.

In order to ensure long term protection of the environment from harmful constituents, special consideration of disposal sites should be made. All landfill sites should be selected so as to prevent horizontal and vertical migration of these contaminants to ground or surface waters. In cases where geological conditions may not reasonably ensure this, adequate mechanical precautions (e.g. impervious liners) should be taken to ensure long term protection to the environment. A program of routine periodic sampling and analysis of leachates is advisable. Where appropriate the location of solid hazardous materials disposal sites should be permanently recorded in the appropriate office of legal jurisdiction.

The effect of water pollution control measures on energy requirements has also been determined. The additional energy required in the form of electric power to achieve the effluent limitations proposed herein amounts to slightly over two (2) percent of the electrical power used by the steel industry in 1972.

(v) Economic impact. The regulations proposed herein apply only to the process waste water effluents of the raw steel making operations. The Phase II study of the forming and finishing operations as well as the foundry industry is underway and is expected to be completed in the next few months. This phase will consider thermal limitations on the process and noncontact cooling waters of all operations in the industry.

The costs and methods for fugitive runoff controls for the raw steel making operations have already been developed but action on this has been deferred until the total water pollution control costs for all operations has been developed.

The annual costs to achieve the regulations proposed herein are estimated at 0.37 percent of the 1972 gross revenues of the steel industry. This is in addition

to the $127 million annual operating costs (including amortization) which it is estimated that the industry is already spending. The total estimated costs for water pollution control will be available only after the Phase II study is completed. However, the preliminary estimate is that the additional annual costs (including amortization) for the remaining forming and finishing operations, for thermal limitations, and for fugitive runoff controls will be approximately three to four times those proposed herein for the steel making operations or 295 million per year. Total annual costs (including amortization) for water pollution controls after 1983, including operation and amortization of existing facilities, are estimated at $551 million or 2.45 percent of the 1972 gross revenue. Of this amount, $377 million (or 1.68 percent) will be incremental to the current rate of expenditures.

As presented in the table, an initial capital investment of approximately $144.9 million with annual capital and operating costs of $39.9 million would be required by the industry to achieve BPCTCA guidelines. An additional capital investment of approximately $122.3 million and a total annual capital amortization and operating cost of $82.3 million would be needed to achieve BATEA guidelines. Costs may vary depending upon such factors as location, availability of land and chemicals, flow to be treated, treatment technology selected where competing alternatives exist, and the extent of preliminary modifications required to accept the necessary control and treatment devices.

The operating costs (including amortization) for air pollution controls for the steel industry, as presented in the Council on Environmental Quality report of March, 1972 titled "Economic Impact of Pollution Control—A Summary of Recent Studies" shows costs building up to $693 million dollars per year for 1976. This is equivalent to 3.1 percent of the 1972 gross revenue of the industry.

The total annual costs (including amortization) for air and water pollution controls for all operations of the steel industry is thus estimated at 1.24 billion per year after 1983 or 5.54 percent of gross revenues for 1972. This includes the $292 million or 1.3 percent of gross revenue for 1972 which it is estimated that the industry is currently spending annually for air and water pollution controls.

The report entitled "Development Document for Proposed Effluent Limitations Guidelines and New Source Performance Standards for the steel making Segment of the Iron and Steel Manufacturing Point Source Category" details the analysis undertaken in support of the regulations being proposed herein and is available for inspection in the EPA Information Center, Room 227, West Tower, Waterside Mall, Washington, D.C., at all EPA regional offices, and at State water pollution control offices. A supplementary analysis prepared for EPA of the possible economic effects of the proposed regulations is also available for inspection at these locations. Copies of both of these documents are being sent to persons or institutions affected by the proposed regulations, or who have placed themselves on a mailing list for this purpose (see EPA's Advance Notice of Public Review Procedures, 38 FR 21202, August 6, 1973). An additional limited number of copies of both reports are available. Persons wishing to obtain a copy may write the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460, Attention: Mr. Philip B. Wisman.

On June 14, 1973, the Agency published procedures designed to insure that, when certain major standards, regulations, and guidelines are proposed, an explanation of their basis, purpose and environmental effects is made available to the public. (38 FR 15653) The procedures are applicable to major standards, regulations and guidelines which are proposed on or after December 31, 1973, and which prescribe national standards of environmental quality or require national emission, effluent or performance standards and limitations.

The Agency determined to implement these procedures in order to insure that the public was apprised of the environmental effects of its major standards setting actions and was provided with detailed background information to assist it in commenting on the merits of a proposed action. In brief, the procedures call for the Agency to make public the information available to it delineating the major environmental effects of a proposed action, to discuss the pertinent nonenvironmental factors affecting the decision, and to explain the viable options available to it and the reasons for the option selected.

The procedures contemplate publication of this information in the FEDERAL REGISTER, where this is practicable. They provide, however, that where, because of the length of these materials, such publication is impracticable, the material may be made available in an alternate format.

The report entitled "Development Document for Proposed Effluent Limitations Guidelines and New Source Performance Standards for the Steel Making Segment of the Iron and Steel Manufacturing Point Source Category" contains information available to the Agency concerning the major environmental effects of the regulation proposed below, including: (1) The pollutants presently discharged into the Nation's waterways by manufacturers of iron and steel and the degree of pollution reduction obtainable from implementation of the proposed guidelines and standards (see particularly Sections IV, V, VI, IX, X and XI); (2) the anticipated effects of the proposed regulation on other aspects of the environment including air, subsurface waters, solid waste disposal and land use, and noise (see particularly Section VIII); and (3) options available to the Agency in developing the proposed regulatory system and the reasons for its selecting the particular levels of effluent reduction which are proposed (see particularly Sections VI, VII, and VIII).

The supplementary report entitled "Economic Analysis of Proposed Effluent Guidelines for the Integrated Iron and Steel Industry" contains an estimate of the costs of pollution control requirements and an analysis of the possible effects of the proposed regulations on prices, production levels, employment, communities in which iron and steel manufacturing plants are located, and international trade. In addition, the above described Development Document describes, in Section VIII, the cost and energy consumption implications of the proposed regulations.

The two reports described above in the aggregate exceed 100 pages in length and contain a substantial number of charts, diagrams, and tables. It is clearly impracticable to publish the material contained in these documents in the FEDERAL REGISTER. To the extent possible, significant aspects of the material have been presented in summary form in foregoing portions of this preamble. Additional discussion is contained in the following analysis of comments received and the Agency's response to them. As has been indicated, both documents are available for inspection at the Agency's Washington and regional offices and at State water pollution control agency offices. Copies of each have been distributed to persons and institutions affected by the proposed regulations who have placed themselves on a mailing list for this purpose. Finally, as long as the supply remains available, additional copies may be obtained from the Agency as described above.

When regulations for the iron and steel industry are promulgated in final form, revised copies of the Development Document will be available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Copies of the Economic Analysis will be available through the National Technical Information Service, Springfield, Virginia 22151.

(c) *Summary of public participation.* Prior to this publication, the agencies and groups listed below were consulted and given an opportunity to participate in the development of effluent limitations guidelines and standards proposed for the iron and steel manufacturing category. All participating agencies have been informed of project developments. An initial draft of the Development Document was sent to all participants and comments were solicited on that report. The following are the principal agencies and groups consulted: (1) Effluent Standards and Water Quality Information Advisory Committee (established under section 515 of the Act); (2) Ohio River Valley Sanitation Commission; (3) New England Interstate Water Pollution Control Commission; (4) Delaware River Basin Commission; (5) Hudson River Sloop Restoration, Inc.; (6) Conservation Foundation; (7) Environmental Defense Fund, Inc.; (8) Natural Resources Defense Council; (9) The American Society of Civil Engineers;

(10) Water Pollution Control Federation; (11) National Wildlife Federation; (12) The American Society of Civil Engineers; Engineers; (13) U.S. Department of Commerce; (14) U.S. Department of the Interior; (15) Water Resources Council; (16) U.S. Department of Housing and Urban Development; (17) American Iron and Steel Institute; (18) American Coke and Coal Chemicals Institute; and (19) Association of Iron and Steel Engineers.

The following organizations responded with comments: U.S. Department of Commerce, U.S. Department of Interior, U.S. Water Resources Council, Delaware River Basin Commission, West Trenton, New Jersey, Arizona Department of Health, California Water Resources Control Board, Colorado Department of Health, Georgia Environmental Protection Division, Hawaii, Department of Health, Illinois Division of Water. Pollution Control, Kentucky Department of Natural Resources, Maine Department of Environmental Protection, Michigan Department of Natural Resources, Nebraska Department of Environmental Control, New York Division of Pure Waters, North Carolina Department of Natural and Economic Resources, Pennsylvania Department of Environmental Resources, Texas Water Quality Board, Washington Department of Ecology, League of Women Voters of Illinois, Chicago, Illinois, U.S. Pipe and Foundry Co., Birmingham, Alabama, American Iron and Steel Institute, Washington, D.C., and Allied Chemical Corporation, Morristown, New Jersey.

Many comments were received on the contractors proposed regulations and draft report. The regulations proposed herein represent a major revision of the material initially distributed for review. Dependent upon the reviewing group, comments ranged from the extreme of the standards being too loose to the other extreme of being unduly restrictive. The primary issues raised in the development of these proposed effluent limitations guidelines and standards of performance, and the treatment of these issues herein are as follows.

(1) The contractors initial proposed regulations and draft report were criticized for specifying effluent limitations for BPCTCA that were more restrictive than the average of the best plants.

The average of the plants studied was adhered to where possible, but in the instances where plants were not applying good water conservation practices, were not utilizing available waste treatment facilities, or were not making optimum use of treatment facilities, such plants were deleted from the averages, or if appropriate, all plants in a subcategory were declared inadequate with respect to water conservation practices or treatment. In these instances, the BPCTCA limitations were based on the effluent quality attainable by the use of demonstrated treatment technology. Technology transferred from other industries or within the steel industry was used only as the basis for achieving some of the proposed BATEA and NSPS limitations.

(2) It has been recommended that the Interim Guidance (A&B) issued by the EPA Office of Permit Programs be adopted rather than the limitations proposed in the contractors draft report.

The guidelines proposed herein are based on an indepth study inclusive of sampling programs at selected plants displaying in various degrees the best practicable treatment technology. The selected operations are covered in more detail in the present study in contrast to the broad categorization of coke, iron, and steel manufacturing covered in the A and B Guidance. The other operations associated with the industry will be covered in detail in Phase II. The A and B numbers were developed primarily on industry and EPA technical discussions and a previous "state of the art" study by the same contractor and covered only a few parameters in contrast to the proposed guidelines. The B limitations are much less restrictive than the A limitations which for the most part are equivalent to the BPCTCA limitations proposed herein and are much less restrictive than the BATEA and NSPS limitations proposed. The proposed limitations are based on good water conservation practices, treatment technology capabilities, treatment costs, and economic impact. The adoption of less restrictive requirements would not be consistent with the requirements of the Act.

(3) An industry source contends that an additional capital cost of $1.5 billion is needed to achieve compliance with the "A" level of the EPA Interim Guidance for all operations.

The EPA estimated costs are approximately $144.9 million for the initial capital investment to achieve BPCTCA proposed guidelines and an additional $122.3 million dollars to meet BATEA proposed guidelines for the steelmaking operations only. The industry believes that the EPA estimated costs are low. However, our estimate of additional capital cost to achieve BPCTCA and BATEA limitations for all operations (raw steel making, forming and finishing, thermal limitations, and fugitive runoff control) is 1,540 million or a total capital investment of 2,300 million including the control facilities already in place.

The EPA cost estimates are based on treatment facilities contained within a "battery limit" site location on a "green field" site. Land acquisition costs and expansion of existing support facilities are not included in cost estimates. Special local conditions such as building code requirements, safety requirements, labor rates, contractual agreements, etc., are not included in cost estimates.

In general, cost estimates do reflect an on-site "battery limit" treatment plant with electrical substation and equipment for powering the facilities, all necessary pumps, treatment plant interconnecting feed pipe lines, chemical treatment facilities, foundations, structural steel, and control house. Access roadways within battery limits area are included in estimates based upon 1½" thick bituminous wearing course and 4" thick subbase with sealer, binder, and gravel surfacing. A 9 gauge chain link fence with three strand barb wire and one truck gate was included for fencing in the treatment facilities area. The cost estimates also include a 15 percent contingency, 10 percent contractor's overhead and profit, and engineering fees of 15 percent.

(4) It has been contended that the BPCTCA limits are minimal and overall BATEA standards should be imposed by July, 1977.

Application of the BATEA numbers by 1977 is not consistent with the requirements of the Act. The proposed BPCTCA and BATEA guidelines can be applied in an add-on fashion so as not to impose an undue hardship on the industry. However, economics have dictated that the application of some treatment technologies be deferred until 1983 and that some high concentrations of pollutants representing a low percentage of the initial load, be tolerated in the interim. This is necessary to give this and the many other industries facing tighter controls an opportunity to spread these large capital requirements for water pollution controls over a longer period of time and to make it possible for the equipment suppliers and construction firms to provide and build the required facilities with less of the strain and disruption that would be inherent in a crash program.

(5) Several groups objected to the use of net numbers as was done in the contractors initial draft report. One group pointed out that this insures downstream degradation of the waterway.

The technical report has been reworked and the effluent numbers are presented on an absolute basis. This is appropriate since the concentration of a pollutant remaining after a given treatment is relatively independent of the concentration in the raw waste or the source of the pollutant.

(6) The proposed regulations have been criticized for not covering all operations of the industry.

The Phase II study of the industry is underway and will consider the forming and finishing operations, the nonintegrated mill operations, foundry operations, thermal limitations (both process and noncontact cooling waters) and fugitive runoffs. A Group II industry study will consider effluent limitations on mining operations.

(7) Comments have been received to the effect that the very limited data makes a sound statistical evaluation of the data doubtful.

The sampling program of this industry study was designed to provide a basis for determining the adequacy or accuracy of a larger data base expected to be available from the permit applications and from data provided by the industry. These sources contributed only a limited amount of data of value to the study. Within the required time constraints for collection of data, it was impossible to expand the sampling and analytical work to cover more plants, or even to collect more samples from the same plants. However, it is felt that the overall type sampling performed provides a good representation of steel mill waste waters and that this data, together with data

from demonstration projects and the contractors many years of experience in water and waste treatment in this and other industries, provides an adequate basis for the proposed regulations.

(8) The regulations initially proposed by the contractor and the technical document on which they were based were criticized for requiring the use of technology not proven in the steel industry and in some cases were said to be based only on pilot plant results and that alternate treatment technologies were not evaluated.

The EPCTCA limitations proposed herein are much less restrictive than those proposed by the contractor and can be achieved by the application of treatment technology in use in the steel industry today. The BATEA limitations proposed herein are only slightly less restrictive than those proposed by the contractor. The reductions made were made to avoid reliance on two transfer technologies (activated alumina adsorption for fluoride removal and blowdown softening as a means to accomplish total recycle without discharge) of questionable value or applicability. The BATEA limitations proposed herein are based on demonstrated water conservation and treatment practices and on the use of four transfer technologies and one pilot technology with the latter being proposed as one of two alternates either of which can achieve the BATEA limitations.

Thirteen treatment models to achieve the effluent quality proposed for each subcategory (including an alternate for the by-product coke subcategory) have been developed. The development included not only a determination that a treatment facility of the type indicated for each subcategory could achieve the effluent quality proposed but it included a determination of the capital investment and the total annual operating costs for the average size facility. In all subcategories these models are based on the combination of process changes and unit (waste treatment) operations in an "add-on" fashion as required to control the significant waste parameters. The process changes and the unit operations were each selected as the least expensive means that could be devised to accomplish their particular function and thus their combination into a treatment model presents the least expensive method for control for a given subcategory.

In only one subcategory, by-product coke, was an alternate developed to provide an option for a high capital investment and high operating cost biological system as compared to the low capital investment low operating cost physical-chemical system) to achieve the BPCTCA limitations for 1977. This alternate was developed because the multistage biological system, which would be an add-on to the BPCTCA single stage biosystem, is the most economical way to achieve the BATEA limitations for 1983.

However, to achieve the BATEA limitations the alternate relies on the use of treatment technology that has been developed only to the pilot stage or as steps utilized individually, but not in the combination required in this model on this type of waste on a full-scale basis. The effluent limitations have been established such that either alternate can achieve the effluent qualities on which the BPCTCA and BATEA limitations are based.

A cost analysis indicates that the limitations on byproduct coke operations can most economically be achieved by applying alternate I to achieve BPCTCA and alternate II to achieve BATEA. Costs were therefore developed on the basis of depreciations of the BPCTCA system in 6 years (1977–1983). This not only saves enough on annual operating costs from the present to 1983 to more than offset the increased capital cost incurred in converting from one control technology to the other in 1983 (switching from physical-chemical to biological means of control), but it also minimizes the total costs during the interim period while other possible alternates are evaluated and allows for flexibility in the event that BATEA limitations are later revised to lower values or to no discharge of process waste water pollutants to navigable waters.

The 13 treatment models are comprised of combinations of as many of 24 basic process changes, operating modes, or unit (waste treatment) operations as are required to control all significant pollutants in a given subcategory. Of the 24 basics only 4 involves technology transfer from other areas and only one involves pilot technology. This is used only on one alternate, to achieve BATEA limitations as discussed above. None of the transferred technologies are employed to achieve BPCTCA in any subcategory. All four transferred technologies are practiced to achieve the BATEA limitations only in five subcategories including one technology transferred only from one steel industry subcategory to another.

In the 13 treatment models the 24 basics are used over and over. These are listed in the attached and are summarized as follows:

	Technology applications			
	Demonstrated	Transferred	Pilot	Total
Base level	48			48
BPCTCA	33			33
BATEA	33	9	1	43
Total	119	9	1	129

Among the transferred technologies alkaline chlorination, which is recommended by the By Products Coke subcategory on a flow of 835 l/kkg (100 gal/1000 lb) or less, is used at one blast furnace installation with a flow of 19,180 l/kkg (2300 gal/1000 lb) and has been broadly applied for years in the electroplating industry on very small flows. thus demonstrating that this technology can reasonably be applied at the flow rates expected. Breakpoint chlorination has been broadly applied for years in the water treating industry. Activated carbon adsorption has been applied full scale in the petroleum industry and other industries. Biological denitrification has been used full-scale for nitrate reduction in domestic waste treatment. All four transferred technologies are recommended for use only to achieve BATEA limitations.

(9) The effluent limitations have been developed from a determination of minimum unit effluent volumes and minimum concentrations achieveable by treatment technology. The feasibility of achieving these low unit effluent volumes has been questioned.

While unit effluent volumes and concentrations are not limited as such, the effluent limitations are most likely to be met by achieving those flows and concentrations on which the limitations are based. The limitations can, however, be met by achieving correspondingly lower concentrations if flows are exceeded or vice-versa.

The proposed limitations have been based on higher effluent volumes per unit of production than was recommended by the contractor's draft report in the by-product coke (BPCTCA), blast furnace, vacuum degassing, and continuous casting subcategories.

Where effluent volumes per unit of production were considered excessive on the plants visited a lower rate was used. The sintering operation is an example. The plant visited was discharging 475 l/kkg (57 gal/1000 lb) from the combined blast furnace sinter plant waste treatment. This was equivalent to a blowdown of 33 percent of the 1420 l/kkg (171 gal/1000 lb) recycle rate. The effluent limitations were based on a flow of 209 l/kkg (25 gal/1000 lb) which is equivalent to a 15 percent blowdown. This blowdown rate is well above that achieved by several recycle systems already in use.

(10) One of the major considerations that must be deferred pending completion of the Phase II study of the remaining steel mill operations is the economic impact of the total costs for water pollution control for the industry.

These costs have been estimated and discussed above under paragraph (v) Economic Impact.

(11) Another point of disagreement with the contractor's initial proposed effluent limitations was the designation of a limitation only on cyanides amenable to chlorination rather than on total cyanides.

The effluent limitations proposed herein for BPCTCA are based on demonstrated treatment technologies and now include a total cyanide limitation. The BATEA limitations proposed herein are based on the capabilities of treatment models which include cyanide destruction by alkaline chlorination and breakpoint chlorination or by multi-stage biological treatment. These treatments will destroy the free cyanide which is the most toxic form. The ability of the treatments to reduce the complex, i.e. less toxic, cyanide compounds to the levels indicated is less certain. Additional information will be needed before limitations can be placed on total cyanides for the BATEA limitations based on

these treatment technologies indicated. Preferably this information should be obtained after full scale facilities of the above types have been installed, operated, and the results analyzed.

The BATEA cyanide limitations are to be achieved by destruction of the cyanides and not by the conversion of cyanides to the complex form. While the complex cyanides can under certain conditions be concerted to the more toxic free cyanide form, the rates and conditions are such as to make the discharge of complex cyanide less hazardous under normal conditions than the discharge of free cyanides.

(12) The effluent limitations proposed herein have been criticized for not including a limit on soluble iron.

The concentration of iron appearing in the effluent is a function of the chemical form in which it is present and on the pH and temperature of the effluent. In the steel making operations the iron is present in the very insoluble oxide form and on this basis soluble iron did not need to be established as a control parameter for these operations. The suspended solids limitations place a limit on the iron present in the insoluble form.

Interested persons may participate in this rulemaking by submitting written comments in triplicate to the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460. Attention: Mr. Philip B. Wisman. Comments on all aspects of the proposed regulations are solicited. In the event comments are in the nature of criticisms as to the adequacy of data which is available, or which may be relied upon by the Agency, comments should identify and, if possible, provide any additional data which may be available and should indicate why such data is essential to the development of the regulations. In the event comments address the approach taken by the agency in establishing an effluent limitation guideline or standard of performance, EPA solicits suggestions as to what alternative approach should be taken and why and how this alternative better satisfies the detailed requirements of sections 301, 304(b), 306, and 307 of the Act.

A copy of all public comments will be available for inspection and copying at the EPA Information Center, Room 227, West Tower, Waterside Mall, 401 M Street, SW., Washington, D.C. A copy of preliminary draft contractor reports, the Development Document and economic study referred to above and certain supplementary materials supporting the study of the industry concerned will also be maintained at this location for public review and copying. The EPA information regulation, 40 CFR Part 2, provides that a reasonable fee may be charged for copying.

All comments received on or before March 21, 1974, will be considered. Steps previously taken by the Environmental Protection Agency to facilitate public response within this time period are outlined in the advance notice concerning public review procedures published on August 6, 1973 (38 FR 21202).

Dated: January 31, 1974.

JOHN QUARLES,
Acting Administrator.

It is proposed to amend 40 CFR Chapter I by adding a new Part 420 to read as follows:

PART 420—EFFLUENT LIMITATIONS GUIDELINES FOR EXISTING SOURCES AND STANDARDS OF PERFORMANCE AND PRETREATMENT STANDARDS FOR NEW SOURCES FOR THE IRON AND STEEL MANUFACTURING POINT SOURCE CATEGORY

Subpart A—By-Product Coke Subcategory

Sec.
420.10 Applicability; description of the By-Product Coke Subcategory.
420.11 Specialized Definitions.
420.12 Effluent limitations guidelines representing the effluent quality attainable by the application the best practicable control technology currently available.
420.13 Effluent limitations guidelines representing the degree of effluent quality attainable by the application the best available technology economically achievable.
420.14 Standards of performance for new sources.
420.15 Pretreatment standards for new sources.

Subpart B—Beehive Coke Subcategory

420.20 Applicability; description of the Beehive Coke Subcategory.
420.21 Specialized definitions.
420.22 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.
420.23 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.
420.24 Standards of performance for new sources.
420.25 Pretreatment standards for new sources.

Subpart C—Sintering Subcategory

420.30 Applicability; description of the Sintering Subcategory.
420.31 Specialized definitions.
420.32 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.
420.33 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.
420.34 Standards of performance for new sources.
420.35 Pretreatment standards for new sources.

Subpart D—Blast Furnace (Iron) Subcategory

420.40 Applicability; description of the Blast Furnace (Iron) Subcategory.
420.41 Specialized definitions.
420.42 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.
420.43 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.
420.44 Standards of Performance for new sources.
420.45 Pretreatment standards for new sources.

Subpart E—Blast Furnace (Ferromanganese) Subcategory

420.50 Applicability; description of the Blast Furnace (Ferromanganese) Subcategory.
420.51 Specialized definitions.
420.52 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.
420.53 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.
420.54 Standards of performance for new sources.
420.55 Pretreatment standards for new sources.

Subpart F—Basic Oxygen Furnace (Semi Wet Air Pollution Control Methods) Subcategory

420.60 Applicability; description of the Basic Oxygen Furnace (Semi Wet) Subcategory.
420.61 Specialized definitions.
420.62 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.
420.63 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.
420.64 Standards of performance for new sources.
420.65 Pretreatment standards for new sources.

Subpart G—Basic Oxygen Furnace (Wet Air Pollution Control Methods) Subcategory

420.70 Applicability; description of the Basic Oxygen Furnace (Wet) Subcategory.
420.71 Specialized definitions.
420.72 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.
420.73 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.
420.74 Standards of performance for new sources.
420.75 Pretreatment standards for new sources.

Subpart H—Open Hearth Furnace Subcategory

420.80 Applicability; description of the Open Hearth Furnace Subcategory.
420.81 Specialized Definitions.
420.82 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.
420.83 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

Subpart A—By-Product Coke Subcategory

§ 420.10 Applicability; description of the by-product coke subcategory.

The provisions of this subpart apply to all coke making operations conducted by the heating of coal in slot type ovens in the absence of air to produce coke.

§ 420.11 Specialized definitions.

For the purposes of this subpart:

(a) The term "cyanide*A*" shall mean those cyanides amenable to chlorination as described in "1972 Annual Book of ASTM Standards," 1972. Standard D2036–72, Method B, page 553.

(b) The term "product" shall mean coke.

(c) The abbreviations listed shall have the following meaning: (i) The term "kg" shall mean kilogram(s); (ii) the term "kkg" shall mean 1000 kilogram(s); (iii) the term "lb" shall mean pound(s); and (iv) "TSS" shall mean total suspended nonfilterable solids.

§ 420.12 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) Based upon the application of the best practicable control technology currently available the effluent quality required to be achieved under section 301(b)(1)(A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
Cyanide *T*	Maximum for any 1 day: 0.0438 kg/kkg of product (0.0438 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0219 kg/kkg of product (0.0219 lb/1,000 lb).
Phenol	Maximum for any 1 day: 0.0029 kg/kkg of product (0.0029 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0015 kg/kkg of product (0.0015 lb/1,000 lb).
Ammonia	Maximum for any 1 day: 0.1825 kg/kkg of product (0.1825 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0912 kg/kkg of product, 0.0912 lb/1,000 lb).
BOD5	Maximum for any 1 day: 0.2190 kg/kkg of product (0.2190 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.1095 kg/kkg of product (0.1095 lb/1,000 lb).
Oil and grease	Maximum for any 1 day: 0.0219 kg/kkg of product (0.0219 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0109 kg/kkg of product (0.0109 lb/1,000 lb).
TSS	Maximum for any 1 day: 0.0730 kg/kkg of product (0.0730 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0365 kg/kkg of product (0.0365 lb/1,000 lb).
ph	Within the range 6.0 to 9.0.

(b) Application of the factors listed in section 304(b)(1)(B) will require variation from the effluent limitation set forth in this section for any point source subject to such effluent limitation only for those coke plants utilizing desulfurization units. The limitation specified may be exceeded up to 15 percent by those facilities equipped with gas desulfurization units to the extent that such measured discharge is necessary by reason of the increased effluent volume generated by these facilities.

§ 420.13 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) Based upon the application of the best available technology economically achieveable, the effluent quality required to be achieved under section 301(b)(2)(A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
Cyanide *A*	Maximum for any 1 day: 0.0002 kg/kkg of product (0.0002 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0001 kg/kkg of product (0.0001 lb/1,000 lb).
Phenol	Maximum for any 1 day: 0.0004 kg/kkg of product 0.0004 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0002 kg/kkg of product (0.0002 lb/1,000 lb).
Ammonia	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
BOD5	Maximum for any 1 day: 0.0166 kg/kkg of product (0.0166 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb).
Sulfide	Maximum for any 1 day: 0.0003 kg/kkg of product (0.0003 lb/1,000 lb). Maximum average of daily vauues for any period of 30 consecutive days: 0.0001 kg/kkg of product (0.0001 lb/1,000 lb).

Effluent characteristic	Effluent limitation
Oil and grease.	Maximum for any 1 day: period shall not exceed 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
TSS	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

(b) Application of the factors listed in section 304(b)(2)(B) will require variation from the effluent limitation set forth in this section for any point source subject to such effluent limitations, only for those coke plants utilizing desulfurization units. The limitations specified may be exceeded up to 25 percent by those facilities equipped with gas desulfurization units to the extent that such measured discharge is necessary by reason of the increased effluent volume generated by these facilities.

§ 420.14 Standards of performance for new sources.

(a) Based upon the application of the best available demonstrated control technology, processes, operating methods, or other alternatives, the effluent quality required to be achieved by new sources under section 306(e) of the Act is as set forth in the following table:

Effluent characteristic	Effluent limitation
Cyanide A	Maximum for any 1 day: 0.0002 kg/kkg of product (0.0002 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0001 kg/kkg of product (0.0001 lb/1,000 lb).
Phenol	Maximum for any 1 day: 0.0004 kg/kkg of product (0.0004 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0002 kg/kkg of product (0.0002 lb/1,000 lb).
Ammonia	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
BOD5	Maximum for any 1 day: 0.0166 kg/kkg of product (0.0166 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb).
Sulfide	Maximum for any 1 day; 0.0003 kg/kkg of product (0.0003 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days; 0.0001 kg/kkg of product (0.0001 lb/1,000 lb).
Oil and grease.	Maximum for any 1 day; 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
TSS	Maximum for any 1 day; 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

(b) Application of the factors listed in section 306(b)(1)(B) will require variation from the effluent limitation set forth in this section for any point source subject to such effluent limitations only for those coke plants utilizing desulfurization units. The limitations specified may be exceeded up to 25 percent in the case of facilities equipped with gas desulfurization units to the extent that such measured discharge is necessary by reason of the increased effluent volume generated by these facilities.

§ 420.15 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the By Product Coke subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.14, 40 CFR, Part 420: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart B—Beehive Coke Subcategory

§ 420.20 Applicability; description of the beehive coke subcategory.

The provisions of this subpart apply to all coke making operations conducted by the heating of coal with the admission of air in controlled amounts for the purpose of producing coke. There are no by-product plants associated with the beehive operation.

§ 420.21 Specialized definitions.

For the purposes of this subpart:

(a) The term "process waste water" shall mean any water which, during the manufacturing process, comes into direct contact with any raw material, intermediate product, by-product or product used in or resulting from the production of coke in the beehive coke subcategory.

(b) The term "process waste water pollutants" shall mean pollutants contained in process waste water.

§ 420.22 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best available technology economically achievable by a point source subject to the provisions of this subpart: There shall be no discharge of process waste water pollutants to navigable waters.

§ 420.23 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best available technology economically achievable by a point source subject to the provisions of this subpart: There shall be no discharge of process waste water pollutants to navigable waters.

§ 420.24 Standards of performance for new sources.

(a) The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged reflecting the greatest degree of effluent reduction achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants by a new point source subject to the provisions of this subpart: there shall be no discharge of process waste water pollutants to navigable waters.

§ 420.25 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Beehive Coke subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this title except that for the purpose of this section, § 128.133 of this title shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.24, 40 CFR, Part 420: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart C—Sintering Subcategory

§ 420.30 Applicability; description of the sintering subcategory.

The provisions of this subpart apply to all sintering operations conducted by the heating of iron bearing wastes (mill scale and dust from blast and steelmaking furnaces) together with fine iron ore, limestone, and coke fines in an ignition furnace to produce an agglomerate for charging to the blast furnace.

§ 420.31 Specialized definitions.

For the purposes of this subpart:

(a) The term "product" shall mean sinter.

(b) The abbreviations listed shall have the following meaning: (1) The term "kg" shall mean kilogram(s); (2) the term "kkg" shall mean 1000 kilograms; (3) the term "lb" shall mean pound(s); and (4) "TSS" shall mean total suspended nonfilterable solids.

§ 420.32 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) Based upon the application of the best practicable control technology currently available the effluent quality required to be achieved under section 301 (b) (1) (A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: period shall not exceed 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
Oil and grease.	Maximum for any 1 day: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0021 kg/kkg of product (0.0021 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.33 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically available.

(a) Based upon the application of the best available technology economically achievable, the effluent quality required to be achieved under section 301(b) (2) (A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Oil and grease.	Maximum for any 1 day: period shall not exceed 0.0042 kg/kkg of product (0.0042 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0021 kg/kkg of product (0.0021 lb/1,000 lb).
Sulfide	Maximum for any 1 day: period shall not exceed 0.00012 kg/kkg of product (0.00012 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00006 kg/kkg of product (0.00006 lb/1,000 lb).
Fluoride	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.34 Standards of performance for new sources.

(a) Based upon the application of the best available demonstrated control technology, processes, operating methods, or other alternatives, the effluent quality required to be achieved by new sources under section 306(e) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Oil and grease.	Maximum for any 1 day: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0021 kg/kkg of product (0.0021 lb/1,000 lb).
Sulfide	Maximum for any 1 day: period shall not exceed 0.00012 kg/kkg of product (0.00012 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00006 kg/kkg of product (0.00006 lb/1,000 lb).
Fluoride	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.35 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Sintering subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.34, 40 CFR, Part 420, *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart D—Blast Furnace (Iron) Subcategory

§ 420.40 Applicability; description of the blast furnace (iron) subcategory.

The provisions of this subpart apply to all iron making operations in which iron ore is reduced to molten iron in a blast furnace.

§ 420.41 Specialized definitions.

For the purposes of this subpart:

(a) The term "cyanide A" shall mean those cyanides amenable to chlorination as described in "1972 Annual Book of ASTM Standards," 1972, Standard D2036-72, Method B, page 553.

(b) The term "product" shall mean iron.

(c) The abbreviations listed shall have the following meaning: (1) The term "kg" shall mean kilogram(s); (2) the term "kkg" shall mean 1000 kilograms; (3) the term "lb" shall mean pound(s); and (4) "TSS" shall mean total suspended nonfilterable solids.

§ 420.42 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) Based upon the application of the best practicable control technology currently available the effluent quality required to be achieved under section 301 (b) (1) (A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0521 kg/kkg of product (0.0521 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0260 kg/kkg of product (0.0260 lb/1,000 lb).
Cyanide T	Maximum for any 1 day: 0.0156 kg/kkg of product (0.0156 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0078 kg/kkg of product (0.0078 lb/1,000 lb).

Effluent characteristic	*Effluent limitation*
Phenol	Maximum for any 1 day: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0021 kg/kkg of product (0.0021 lb/1,000 lb).
Ammonia	Maximum for any 1 day: 0.1303 kg/kkg of product (0.1303 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0651 kg/kkg of product (0.0651 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.43 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) Based upon the application of the best available technology economically achievable the effluent quality required to be achieved under section 301(b)(2)(A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Cyanide *A*	Maximum for any 1 day: 0.00026 kg/kkg of product (0.00026 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00013 kg/kkg of product (0.00013 lb/1,000 lb).
Phenol	Maximum for any 1 day: 0.00052 kg/kkg of product (0.00052 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00026 kg/kkg of product (0.00026 lb/1,000 lb).
Ammonia	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Sulfide	Maximum for any 1 day: 0.00031 kg/kkg of product (0.00031 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00016 kg/kkg of product (0.00016 lb/1,000 lb).
Fluoride	Maximum for any 1 day: 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.44 Standards of performance for new sources.

(a) Based upon the application of the best available demonstrated control technology, processes, operating methods, or other alternatives, the effluent quality required to be achieved by new sources under section 306(e) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Cyanide *A*	Maximum for any 1 day: 0.00026 kg/kkg of product (0.00026 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00013 kg/kkg of product (0.00013 lb/1,000 lb).
Phenol	Maximum for any 1 day: 0.00052 kg/kkg of product (0.00052 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00026 kg/kkg of product (0.00026 lb/1,000 lb).
Ammonia	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Sulfide	Maximum for any 1 day: 0.00031 kg/kkg of product (0.00031 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00016 kg/kkg of product (0.00016 lb/1,000 lb).
Fluoride	Maximum for any 1 day: 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.45 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Blast Furnace (Iron) subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter, shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.44, 40 CFR, Part 420: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart E—Blast Furnace (Ferromanganese) Subcategory

§ 420.50 Applicability; description of the blast furnace (ferromanganese) subcategory.

The provisions of this subpart apply to all iron making operations in which iron/manganese ore is reduced to molten ferromanganese in a blast furnace.

§ 420.51 Specialized definitions.

For the purposes of this subpart:

(a) The term "cyanide*A*" shall mean thise cyanides amenable to chlorination as described in "1972 Annual Book of ASTM Standards," 1972, Standard D2036–72, Method B, page 553.

(b) The term "product" shall mean ferromanganese.

(c) The abbreviations listed shall have the following meaning: (1) The term "kg" shall mean kilogram(s); (2) the term "kkg" shall mean 1000 kilograms; (3) the term "lb" shall mean pound(s); and (4) "TSS" shall mean total suspended nonfilterable solids.

§ 420.52 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) Based upon the application of the best practicable control technology currently available the effluent quality required to be achieved under Section 301(b)(1)(A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.2086 kg/kkg of product (0.2086 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.1043 kg/kkg of product (0.1043 lb/1,000 lb).
Cyanide *T*	Maximum for any 1 day: 0.0625 kg/kkg of product (0.0625 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0312 kg/kkg of product (0.0312 lb/1,000 lb).
Phenol	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
Ammonia	Maximum for any 1 day: 0.4172 kg/kkg of product (0.4172 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.2086 kg/kkg of product (0.2086 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.53 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) Based upon the application of the best available technology economically achievable, the effluent quality required to be achieved under section 301(b) (2) (A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
Cyanide *A*	Maximum for any 1 day: 0.00052 kg/kkg of product (0.00052 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00026 kg/kkg of product (0.00026 lb/1,000 lb).
Phenol	Maximum for any 1 day: 0.00104 kg/kkg of product (0.00104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00052 kg/kkg of product (0.00052 lb/1,000 lb).
Ammonia	Maximum for any 1 day: 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
Sulfide	Maximum for any 1 day: 0.00062 kg/kkg of product (0.00062 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00031 kg/kkg of product (0.00031 lb/1,000 lb).
Manganese	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.54 Standards of performance for new sources.

(a) Based upon the application of the best available demonstrated control technology, processes, operating methods, or other alternatives, the effluent quality required to be achieved by new sources under section 306(e) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
Cyanide *A*	Maximum for any 1 day: 0.00052 kg/kkg of product (0.00052 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00026 kg/kkg of product (0.00026 lb/1,000 lb).
Phenol	Maximum for any 1 day: 0.00104 kg/kkg of product (0.00104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00052 kg/kkg of product (0.00052 lb/1,000 lb).
Ammonia	Maximum for any 1 day: 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
Sulfide	Maximum for any 1 day: 0.00062 kg/kkg of product (0.00062 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00031 kg/kkg of product (0.00031 lb/1,000 lb).
Manganese	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.55 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Blast Furnace (Ferromanganese) subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter, shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.54, 40 CFR, Part 420: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart F—Basic Oxygen Furnace (Semi Wet Air Pollution Control Methods) Subcategory

§ 420.60 Applicability; description of the basic oxygen furnace (semi wet) subcategory.

The provisions of this subpart apply to all steelmaking operations conducted by the manufacturer of carbon steel in basic oxygen furnaces equipped with a semi-wet dust collection system.

§ 420.61 Specialized definitions.

For the purposes of this subpart:

(a) The term "process waste water" shall mean any water which, during the manufacturing process, comes into direct contact with any raw material, intermediate product, by-product or product used in or resulting from the production of carbon steel in a basic oxygen furnace equipped with a semi-wet dust collection system.

(b) The term "process waste water pollutants" shall mean pollutants contained in process waste water.

(c) The term "semi-wet" as associated with basic oxygen furnaces shall mean those systems which employ a spray chamber to spray water in excess of the amounts evaporated to condition furnace off-gases to a temperature where the fume and dusts can be removed by dry dust collection equipment. Because excess spray water is used in the spray chamber, an aqueous discharge from that chamber occurs.

§ 420.62 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of best practicable control technology currently available by a point source subject to these provisions of this subpart: There shall be no discharge of process waste water pollutants to navigable waters.

§ 420.63 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best available technology economically achievable by a point source subject to the provisions of this subpart: There shall be no discharge of process waste water pollutants to navigable waters.

§ 420.64 Standards of performance for new sources.

(a) The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged reflecting the greatest degree of effluent reduction achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants by a new point source subject to the provisions of this subpart: there shall be no discharge of process waste water pollutants to navigable waters.

§ 420.65 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Basic Oxygen Furnace (Semi-Wet Air Pollution Control Methods) subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.64, 40 CFR, Part 420: *Provided,* That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart G—Basic Oxygen Furnace (Wet Air Pollution Control Methods) Subcategory

§ 420.70 Applicability; description of the basic oxygen furnace subcategory.

The provisions of this subpart apply to all steelmaking operations conducted for the manufacture of carbon steel in a basic oxygen furnace equipped with a wet dust collection system.

§ 420.71 Specialized definitions.

For the purposes of this subpart:

(a) The term "wet" as associated with basic oxygen furnaces shall mean those off-gas dust cleaning systems which use entirely wet gas cooling and dust removal operations to scrub contaminants from furnace off-gasses, and which produce an aqueous discharge from this operation.

(b) the term "product" shall mean steel.

(c) The abbreviations listed shall have the following meaning: (1) The term "kg" shall mean kilogram(s); (2) the term "kkg" shall mean 1000 kilograms; (3) the term "lb" shall mean pound(s); and (4) "TSS" shall mean total suspended nonfilterable solids.

§ 420.72 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) Based upon the application of the best practicable control technology currently available the effluent quality required to be achieved under section 301 (b) (1) (A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.73 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) Based upon the application of the best available technology economically achievable, the effluent quality required to be achieved under section 301(b) (2) (A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.00052 lb/1,000 lb).
Fluoride	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.74 Standards of performance for new sources.

(a) Based upon the application of the best available demonstrated control technology, processes, operating methods, or other alternatives, the effluent quality required to be achieved by new sources under section 306(e) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Fluoride	Maximum for any 1 day 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb.
pH	Within the range of 6.0 to 9.0.

§ 420.75 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Basic Oxygen Furnace (Wet Air Pollution Control Methods) subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.74, 40 CFR, Part 420: *Provided,* That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart H—Open Hearth Furnace Subcategory

§ 420.80 Applicability; description of the open hearth furnace subcategory.

The provisions of this subpart apply to all steelmaking operations conducted for the manufacture of carbon steel in an open hearth furnace equipped with wet dust collection systems.

§ 420.81 Specialized definitions.

For the purposes of this subpart:

(a) The term "product" shall mean steel.

(b) The abbreviations listed shall have the following meaning: (1) The term "kg" shall mean kilogram(s); (2) the term "kkg" shall mean kilograms; (3) the term "lb" shall mean pound(s); and (4) "TSS" shall mean total suspended nonfilterable solids.

§ 420.82 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) Based upon the application of the best practicable control technology currently available the effluent quality required to be achieved under section 301 (b) (1) (A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.83 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) Based upon the application of the best available technology achievable, the effluent quality required to be achieved under section 301(b) (2) (A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Fluoride	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).

Effluent characteristic	*Effluent limitation*
Nitrate as N03).	Maximum for any 1 day: 0.0187 kg/kkg of product (0.0187 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0094 kg/kkg of product (0.0094 lb/1,000 lb).
Zinc	Maximum for any 1 day: 0.0021 kg/kkg of product (0.0021 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0010 kg/kkg of product (0.0010 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.84 Standards of performance for new sources.

(a) Based upon the application of the best available demonstrated control technology, processes, operating methods, or other alternatives, the effluent quality required to be achieved by new sources under section 306(e) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Fluoride	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
Nitrate (as N03).	Maximum for any 1 day: 0.0187 kg/kkg of product (0.0187 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0094 kg/kkg of product (0.0094 lb/1,000 lb).
Zinc	Maximum for any 1 day: 0.0021 kg/kkg of product (0.0021 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0010 kg/kkg of product (0.0010 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.85 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Open Hearth Furnace subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.84, 40 CFR, Part 420: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart I—Electric Arc Furnace (Semi-Wet Air Pollution Control Methods) Subcategory

§ 420.90 Applicability; description of the electric arc furnace subcategory.

The provisions of this subpart apply to all steelmaking operations conducted for the manufacture of carbon steel utilizing electric arc furnaces equipped with semi-wet dust collection systems.

§ 420.91 Specialized definitions.

For the purposes of this subpart:

(a) The term "process waste water" shall mean any water which, during the manufacturing process, comes into direct contact with any raw material, intermediate product, by-product or product used in or resulting from the production of carbon steel in an electric arc furnace equipped with a semi-wet dust collecting system.

(b) The term "process waste water pollutants" shall mean pollutants contained in process waste water.

(c) The term "semi-wet" as associated with electric arc furnaces shall mean the dust collection systems which use a spray chamber to spray water in excess of the amounts evaporated to condition furnace off-gases to a temperature where the fume and dusts can be removed by dry dust collection equipment. Because excess spray water is used in the spray chamber, an aqueous discharge occurs.

§ 420.92 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best available technology economically available by a point source subject to these provisions of this subpart: there shall be no discharge of process waste water pollutants to navigable waters.

§ 420.93 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best available technology economically achievable by a point source subject to the provisions of this subpart: there shall be no discharge of process waste water pollutants to navigable waters.

§ 420.94 Standards of performance for new sources.

(a) The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged reflecting the greatest degree of effluent reduction achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants by a new point source subject to the provisions of this subpart: there shall be no discharge of process waste water pollutants to navigable waters.

§ 420.95 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Electric Arc Furnace (Semi Wet Air Pollution Control Methods) subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter shall be amended to read as follows:

In addition to the prohibitions set forth in § 123.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.94, 40 CFR, Part 420: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart J—Electric Arc Furnace (Wet Air Pollution Control Methods) Subcategory

§ 420.100 Applicability; description of the electric arc furnace subcategory.

The provisions of this subpart apply to all steelmaking operations conducted for the manufacture of carbon steel utilizing electric arc furnaces equipped with wet furnace off-gas dust collection.

§ 420.101 Specialized definitions.

For the purposes of this subpart:

(a) The term "wet" as associated with electric arc furnaces shall mean those furnace off-gas dust cleaning systems which use entirely wet gas cooling and dust removal operations to scrub contaminants from furnace off-gases, producing aqueous discharges from the operation.

(b) The term "product" shall mean steel.

(c) The abbreviations listed shall have the following meaning: (1) The term "kg" shall mean kilogram(s); (2) the term "kkg" shall mean 1000 kilograms; (3) the term "lb" shall mean pound(s); and (4) "TSS" shall mean total suspended nonfilterable solids.

§ 420.102 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) Based upon the application of the best practicable control technology currently available the effluent quality required to be achieved under section 301(b)(1)(A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0208 kg/kkg of product (0.0208 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.103 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) Based upon the application of the best available technology economically achievable, the effluent quality required to be achieved under section 301(b)(2)(A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Fluoride	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
Zinc	Maximum for any 1 day: 0.0021 kg/kkg of product (0.0021 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0010 kg/kkg of product (0.0010 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.104 Standards of performance for new sources.

(a) Based upon the application of the best available demonstrated control technology, processes, operating methods, or other alternatives, the effluent quality required to be achieved by new sources under section 306(e) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Fluoride	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
Zinc	Maximum for any 1 day: 0.0021 kg/kkg of product (0.0021 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0010 kg/kkg of product (0.0010 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.105 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Electric Arc Furnace (Wet Air Pollution Control Methods) subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.104, 40 CFR, Part 420: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant."

Subpart K—Vacuum Degassing Subcategory

§ 420.110 Applicability; description of the vacuum degassing subcategory.

The provisions of the subpart apply to all operations conducted by applying a vacuum to molten steel to further refine the steel produced.

§ 420.111 Specialized definitions.

For the purposes of this subpart:

(a) The term "product" shall mean steel.

(b) The abbreviations listed shall have the following meaning: (1) The term "kg" shall mean kilogram(s); (2) the term "kkg" shall mean 1000 kilograms; (3) the term "lb" shall mean pound(s); and (4) "TSS" shall mean total suspended nonfilterable solids.

§ 420.112 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) Based upon the application of the best practicable control technology currently available the effluent quality required to be achieved under section 301(b)(1)(A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
Fluoride	Maximum for any 1 day: 0.0083 kg/kkg of product (0.0083 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0042 kg/kkg of product (0.0042 lb/1,000 lb).
Zinc	Maximum for any 1 day: 0.0021 kg/kkg of product (0.0021 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0010 kg/kkg of product (0.0010 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.113 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) Based upon the application of the best available technology economically achievable, the effluent quality required to be achieved under section 301(b)(2)(A) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0026 kg/kkg of product (0.0026 lb/1,000 lb).
Zinc	Maximum for any 1 day: 0.0010 kg/kkg of product (0.0010 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0005 kg/kkg of product (0.0005 lb/1,000 lb).
Manganese	Maximum for any 1 day: 0.0010 kg/kkg of product (0.0010 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0005 kg/kkg of product (0.0005 lb/1,000 lb).
Lead	Maximum for any 1 day: 0.00010 kg/kkg of product (0.00010 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00005 kg/kkg of product (0.00005 lb/1,000 lb).
Nitrate (as NO3).	Maximum for any 1 day: 0.0094 kg/kkg of product (0.0094 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days 0.0047 kg/kkg of product (0.0047 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.114 Standards of performance for new sources.

(a) Based upon the application of the best available demonstrated control technology, processes, operating methods, or other alternatives, the effluent quality required to be achieved by new sources under section 306(e) of the Act is as set forth in the following table:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any 1 day: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0026 kg/kkg of product (0.0026 lb/1,000 lb).

Effluent characteristic	Effluent limitation
Zinc	Maximum for any 1 day: 0.0010 kg/kkg of product (0.0010 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0005 kg/kkg of product (0.0005 lb/1,000 lb).
Manganese	Maximum for any 1 day: 0.0010 kg/kkg of product (0.0010 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0005 kg/kkg of product (0.0005 lb/1,000 lb).
Lead	Maximum for any 1 day: 0.00010 kg/kkg of product (0.00010 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.00005 kg/kkg of product (0.00005 lb/1,000 lb).
Nitrate as N03).	Maximum for any 1 day: 0.0094 kg/kkg of product (0.0094 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0047 kg/kkg of product (0.0047 lb/1,000 lb).
pH	Within the range of 6.0 to 9.0.

§ 420.115 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Vacuum Degassing subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter, shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.114, 40 CFR, Part 420: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

Subpart L—Continuous Casting Subcategory

§ 420.120 Applicability; description of the continuous casting subcategory.

The provisions of this subpart apply to all operations in which steel is continuously cast.

§ 420.121 Specialized definitions.

For the purposes of this subpart:

(a) The term "product" shall mean steel.

(b) The abbreviations listed shall have the following meaning: (1) The term "kg" shall mean kilogram(s); (2) the term "kkg" shall mean 1000 kilograms; (3) the term "lb" shall mean pound(s); and (4) "TSS" shall mean total suspended nonfilterable solids.

§ 420.122 Effluent limitations guidelines representing the effluent quality attainable by the application of the best practicable control technology currently available.

(a) Based upon the application of the best practicable control technology currently available the effluent quality required to be achieved under section 301 (b) (1) (A) of the Act is as set forth in the following table:

Effluent characteristic	Effluent limitation
TSS	Maximum for any 1 day: 0.0521 kg/kkg of product (0.0521 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0260 kg/kkg of product (0.0260 lb/1,000 lb).
Oil and grease.	Maximum for any 1 day: 0.0156 kg/kkg of product (0.0156 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0078 kg/kkg of product (0.0078 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.123 Effluent limitations guidelines representing the effluent quality attainable by the application of the best available technology economically achievable.

(a) Based upon the application of the best available technology economically achievable, the effluent quality required to be achieved under section 301(b) (1) (C) of the Act is as set forth in the following table:

Effluent characteristic	Effluent limitation
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Oil and grease.	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
pH	Within the range 6.0 to 9.0.

§ 420.124 Standards of performance for new sources.

(a) Based upon the application of the best available demonstrated control technology, processes, operating methods, or other alternatives, the effluent quality required to be achieved by new sources under section 306(e) of the Act is as set forth in the following table:

Effluent characteristic	Effluent limitation
TSS	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
Oil and grease.	Maximum for any 1 day: 0.0104 kg/kkg of product (0.0104 lb/1,000 lb). Maximum average of daily values for any period of 30 consecutive days: 0.0052 kg/kkg of product (0.0052 lb/1,000 lb).
ph	Within the range 6.0 to 9.0.

§ 420.125 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the Continuous Casting subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128 of this chapter, except that for the purpose of this section, § 128.133 of this chapter shall be amended to read as follows:

In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 420.124, 40 CFR, Part 420: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant.

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