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Water

EPA

Guidance Manual for

Iron and Steel Manufacturing Pretreatment Standards

GUIDANCE MANUAL
FOR
IRON AND STEEL MANUFACTURING
PRETREATMENT STANDARDS

Prepared by
The
Industrial Technology Division
Office of Water Regulations and Standards
and
Permits Division
Office of Water Enforcement and Permits

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U.S. Environmental Protection Agency
401 M Street, S.W.
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Guidance Manual for Iron and Steel Manufacturing Pretreatment Standards

FROM: Martha G. Prothro, Director
Permits Division (EN-336)

Jeffery D. Denit, Director
Industrial Technology Division

TO: Users of the Guidance Manual

This manual provides information to assist Control Authorities and Approval Authorities in implementing the National Categorical Pretreatment Standards for the Iron and Steel Manufacturing Point Source Category (40 CFR Part 420). It is designed to supplement the more detailed documents listed as reference in the manual; it is not designed to replace them. If you need more complete information on a specific item, you should refer to the appropriate reference.

EPA developed this manual to fill several needs. First, it should be useful to Control Authorities in responding to most routine inquiries from regulated mills. More complex inquiries may require the use of the listed references.

Second, the manual addresses application of the combined wastestream formula to integrated facilities with regulated and unregulated wastestreams. It also provides current information on removal credits, variances and reporting requirements. It further incorporates the final amendment to the categorical standards reflecting the settlement of litigation issues for the final rule.

The manual is the third, in a series of industry-specific guidance manuals for implementing categorical pretreatment standards, and several others will be issued soon. We also plan to issue manuals covering removal credits, the combined wastestream formula and the conversion of production-based categorical standards to equivalent mass-based standards.

Please feel free to write to either the Office of Water Regulations and Standards (WH-552) or the Office of Water Enforcement and Permits (EN-336) with suggestions, additions or improvements.

ACKNOWLEDGEMENTS

We wish to acknowledge the considerable efforts and cooperation of the many people whose contributions helped in the successful completion of this document.

The document was prepared under the direction of Mr. Marvin Rubin, Chief, Analysis and Support Branch, Industrial Technology Division and Dr. James Gallup, Chief, Municipal Programs Branch, Office of Water Enforcement and Permits. Mr. Gary Amendola of EPA Region V, and Mr. Ed Dulaney of the Industrial Technology Division are to be acknowledged for their valuable input. In addition, members of the Office of General Counsel and other members of the Industrial Technolgy Division and Office of Water Enforcement and Permits are acknowledged for their important contributions.

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1. INTRODUCTION

The National Pretreatment Program established an overall strategy for controlling the introduction of nondomestic wastes to publicly owned treatment works (POTWs) in accordance with the overall objectives of the Clean Water Act. Sections 307(b) and (c) of the Act authorize the Environmental Protection Agency to develop national pretreatment standards for new and existing dischargers to POTWs. The Act made these pretreatment standards enforceable against dischargers to publicly owned treatment works.

The General Pretreatment Regulations (40 CFR Part 403) establish administrative mechanisms requiring nearly 1,500 POTWs to develop local pretreatment programs to enforce the general prohibitions, specific prohibitions and Categorical Pretreatment Standards. These Categorical Pretreatment Standards are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of the POTWs. The standards are technology-based for removal of toxic pollutants and contain specific numerical limits based on an evaluation of specific technologies for the particular industry categories. As a result of a settlement agreement between EPA and the Natural Resources Defense Council (NRDC), EPA was required to develop Categorical Pretreatment Standards for 34 industrial categories with a primary emphasis on 65 classes of toxic pollutants.

This manual will provide guidance to POTWs on the implementation and enforcement of the Categorical Pretreatment Standards for the Iron and Steel Manufacturing Category. This document is based primarily on two sources: Federal Register notices, which include the official announcements of the Categorical Standards, and the Final Development Document for Iron and Steel Manufacturing, which provide a summary of the technical support for the regulations. Additional information on the regulations, manufacturing processes, and control technologies can be found in these sources. A listing of the references used in the development of this manual is provided at the end of this document.

1.1 HISTORY OF THE IRON AND STEEL MANUFACTURING CATEGORICAL PRETREATMENT STANDARDS

Steel manufacturing involves many processes, which require large quantities of raw materials. Because of the variety of products and processes in this industry, operations vary from plant to plant. Steel facilities range from plants engaging in a few production processes to extremely large integrated complexes engaging in several or all processes. Even the smallest steel facility represents a large industrial complex.

The steel industry can be segregated into two major components, raw steelmaking, and forming and finishing operations. In the first, coal is converted to coke, which is then combined with iron ore and limestone in a blast furnace to produce iron. The iron is purified into steel in either open hearth, basic oxygen or electric arc furnaces. Finally, the steel can be further refined by vacuum degassing. The second component, following the steelmaking processes, includes hot forming (including continuous casting) and cold finishing operations. Primary hot forming mills reduce steel ingots to slabs or blooms and secondary hot forming mills reduce these to billets, plates, shapes, strips, and other products. Steel finishing operations involve other processes that do little to alter the dimensions of the hot rolled product, but impart desirable surface or mechanical properties.

Water is essential to the industry and is used in appreciable quantities in virtually all operations. An average of 40,000 gallons of water is used in producing every ton of finished steel, making this one of the highest water users of any manufacturing industry. During the raw steelmaking and forming and finishing operations, toxic, nonconventional and conventional pollutants enter the wastewaters. EPA's survey of iron and steel mills identified 141 pollutants in plant effluents. Some of these pollutants pass through POTW treatment systems, interfere with biological treatment, or contaminate POTW sludges. Pretreatment alternatives for the iron and steel industry are designed to control toxic metal pollutants and to recycle wastewater to the manufacturing process. Common treatment technologies include oil skimming, metals precipitation, sedimentation, steam stripping, solvent extraction, biological oxidation (coke wastes), thickening, filtration, and vacuum filter dewatering. Typically, the design, purchase and installation of this equipment requires 18 to 36 months.

Pretreatment standards for the iron and steel industry regulation were first proposed in February 1974, and were first promulgated on June 28, 1974. the most recent final regulations, which established specific numberical limitations falling within 10 of the 12 subcategories, were proposed in January 1981 and finalized on May 27, 1982.

Petitions to review the final iron and steel industry regulation were later filed by certain members of the iron and steel industry and the Natural Resources Defense Council Inc. (NRDC). The challenges raised were consolidated into one lawsuit, and in February 1983, the petitioners and EPA reached a settlement agreement. This comprehensive settlement resolved issues related to the steel industry standards and on October 14, 1983, changes to the regulation were proposed. These major amendments to the Iron and Steel Standards were promulgated on May 17, 1984 (49 FR 21024) and include:

(1) An interim regulation establishing the method for calculating applicable mass-based pretreatment standards;

(2) Establishment of July 10, 1985 as date of final compliance with iron and steel pretreatment standards;

(3) Pretreatment removal credits for phenols measured by the 4 AAP method;

(4) Standards that are slightly higher for lead and zinc in the Sintering and Ironmaking Subcategories;

(5) Standards that are slightly higher for lead and zinc in the Acid Pickling Subcategory;

(6) Modified effluent limitations and standards for zinc in the Hot Coating Subcategory;

(7) Modified combined wastestream formula to allow control authorities to exercise judgment to determine whether blowdown and noncontact cooling streams are dilution or unregulated process streams; and

(8) Regulation for permitting nominal discharges of spent oil or water solution in the cold worked pipe and tube segments of the Cold Rolling Subcategory, with a statement that limits and standards for process wastewaters not regulated by prior regulation are to be developed on a case-by-case basis.

2. IRON AND STEEL CATEGORICAL PRETREATMENT STANDARDS (40 CFR PART 420)

2.1 AFFECTED INDUSTRY

The Iron and Steel Standards are applicable to wastewater discharged from industries included within the Standard Industrial Classification (SIC) Major Group 33 - Primary Metal Industries. Those parts of the industry covered by this regulation are the subgroup SIC numbers 3312 (except Coil Coating), 3315, 3316 and 3317 and parts of 3479.

In developing this regulation, EPA determined that different effluent limitations are appropriate for distinct segments of the industry. The Agency identified 12 main process subcategories which are:

1. Cokemaking
2. Sintering
3. Ironmaking
4. Steelmaking
5. Vacuum Degassing
6. Continuous Casting
7. Hot Forming
8. Salt Bath Descaling
9. Acid Pickling
10. Cold Forming
11. Alkaline Cleaning
12. Hot Coating

These twelve Iron and Steel Operations are briefly discussed below:

1. <u>Cokemaking</u>

   Coke plants are operated at integrated facilities to supply coke for producing iron in blast furnaces or at stand-alone facilities to supply coke to other users. Nearly all active coke plants also produce usable byproducts such as coke oven gas, coal tar, crude or refined light oils, ammonium sulfate or anhydrous ammonia, and naphthalene. A byproduct coke plant consists of ovens in which bituminous coal is heated without air to drive off volatile components. The coke is suppled to blast furnaces, while the volatile components are recovered and processed into byproduct materials.

   The most significant wastewaters generated during byproduct cokemaking and byproduct recovery operations are excess ammonia liquor, final cooler wastewater, light oil recovery wastewaters, barometric condenser wastewaters from the crystallizer, desulfurizer wastewaters, and contaminated wastewaters from air pollution emission scrubbers for charging, pushing, preheating, and screening operations.

2. Sintering

Sintering is an agglomeration process in which iron bearing materials (generally fines) are mixed with iron ore, limestone, and finely divided fuel such as coke breeze. The fines consist of mill scale from hot rolling operations and dust from basic oxygen furnaces, open hearth furnaces, electric arc furnaces, and blast furnaces. The raw materials are mixed before they are placed on the traveling grate of the sinter machine. Near the head end of the grate, the surface of the raw materials is ignited by a gas fired ignition furnace located over the bed. As the mixture moves along the grate, air is drawn through the mixture at the wind boxes to enhance combustion and sinter (fuse) the fine particles. As the bed burns, carbon dioxide, cyanides, sulfur compounds, chlorides, fluorides and oil and grease are driven off with the gases.

The sinter drops off the grate at the discharge end and is cooled (either by air or a water spray), crushed, and screened to maintain uniformity in the size of the sinter fed to blast furnaces. Improperly sized sinter and fines from screening are returned for reprocessing.

3. Ironmaking

Byproduct coke is supplied to blast furnace processes where molten iron is produced for subsequent steelmaking. Iron ore, limestone and coke are placed into the top of a blast furnace and hot air is blown into the bottom. Combustion of the coke provides heat and a reducing atmosphere that produce metallurgical reactions. The limestone forms a fluid slag, which combines with unwanted impurities in the ore. Molten iron and molten slag, which floats on top of the iron, are periodically withdrawn from the bottom of the furnace. Blast furnace flue gas is cleaned and then used to preheat the incoming air of the furnace.

Blast furnace operations use water for two purposes: (1) noncontact cooling of the furnace, stoves, and ancillary facilities not governed by these regulations, and (2) cleaning and cooling the furnace top gases. Other waters, such as floor drains and drip legs, are also part of the process wastewaters, but the volume from these sources is relatively low.

4. Steelmaking

Steel is an alloy of iron containing less than 1.0 percent carbon. Raw materials for steelmaking include hot metal, pig iron, steel scrap, limestone, burned lime, dolomite, fluorspar, iron ores, and iron-bearing materials such as pellets or mill scale. In steelmaking operations, the furnace charge is melted and refined by oxidizing certain constituents, particularly carbon in the molten bath, to specified low levels. Various alloying elements are added to produce different grades of steel. Steelmaking processes in use today are the open hearth furnace, the electric arc furnace, and the basic oxygen furnace (BOF) which is the only one currently associated with discharges to POTWs.

Steelmaking processes generate fumes, smoke, and waste gases as impurities are vaporized. Wastewaters are generated when semi-wet or wet gas collection systems are used to condition and clean the furnace off-gases. Particulates and toxic metals in the gases are the main source of pollutants and contaminants in process wastewaters.

Four main water systems are used in BOF steelmaking operations:

- Oxygen lance noncontact cooling
- Furnace trunnion ring and nose cone noncontact cooling
- Hood noncontact cooling
- Fume collection scrubber and gas cooling.

Most steelmaking operations recycle wastewaters to some degree. Several plants recycle more than 90 percent of their process effluents. Recycling is a good water conservation practice as it not only reduces the volume of fresh water needed by the gas cleaning system, but also reduces the volume of wastewater discharged.

5. Vacuum Degassing

In the vacuum degassing process, molten steel is subjected to a vacuum to remove gases (principally hydrogen, oxygen, sulfur, and nitrogen). The gases can impart detrimental qualities to finished steel products if they are not removed.

Fumes and waste gases are generated by impurities in the steel. The hydrogen, oxygen (reacted with carbon), and nitrogen dissolved in the steel are drawn out by the reduced pressures in the vacuum chamber. Wastewaters are generated in the vacuum degassing process when exhaust steam, used to educt the fumes and gases, is condensed in spray cooling (contact) chambers. Pollutants in the system exhaust contaminate the cooling water, which is discharged into a sump (hot well) through a stand-pipe.

6. Continuous Casting

The continuous casting subcategory includes both ingot casting and continuous casting processes. Ingot casting is the conventional procedure of casting molten steel into ingots followed by reheating and breakdown in primary hot rolling mills into semi-finished shapes known as billets, blooms, or slabs.

In the continuous casting process, hot molten steel is poured from the ladle into a refractory lined tundish. The tundish maintains a constant head of molten metal and can distribute the molten steel to more than one casting strand in multiple strand operations. The molten metal from the tundish pours through nozzles into an oscillating, water-cooled copper mold, where partial solidification takes place. Lubricants, such as rape seed oil, are sprayed into the molds to aid steel movement through the mold. As the metal solidifies in the mold, the cast product is withdrawn continuously. After passing through the water-cooled molds, the partially solidified product moves into a secondary cooling zone, where water sprays cool and solidify it.

The continuous casting process has three main water systems:

- Copper mold noncontact cooling water system
- Machinery noncontact cooling water system
- Cast product spray contact cooling water system.

Only the cast product spray contact cooling water is subject to this regulation as the other two systems use noncontact cooling water only. However, leaks of noncontact cooling water into the process water system would also be treated.

7. <u>Hot Forming</u>

Primary hot forming mills reduce ingots to slabs or blooms and secondary hot forming mills reduce slabs or blooms to billets, plates, shapes, strips, and other forms.

The basic operation in a primary mill is the gradual compression of the steel ingot between two rotating rolls. Multiple passes through the rolls, usually in a reversing mill, are required to reshape the ingot into a slab, bloom, or billet. As the ingot passes through the rolls, high pressure water jets remove surface scale. The ingot passes back and forth between the horizontal and vertical rolls while manipulators turn it. When the desired shape is achieved in the rolling operation, the end pieces (or crops) are sheared off. The semi-finished pieces are stored or sent to reheating furnaces for more shaping.

Scale, oil and grease are the conventional pollutants discharged from rolling mill operations. As the hot steel is rolled in the mill stands, the steel surface oxidizes and scales or flakes off. The scale particles, ranging in size from submicron to several millimeters, are carried by water to scale pits where they settle out. The particles are 70-75 percent iron as ferrous oxide (FeO) and ferric oxide (Fe_2O_3). Overhead cranes equipped with clam buckets are generally used to clean the scale pits. Scale pit effluents are discharged to plant sewers or are partially recycled back to the mills. The suspended solids in scale pit overflows can be as high as 300 mg/l. These wastewaters can be further treated by clarification, filtration, and recycling. Oils, generally in the range of 15 to 45 mg/l, are found in rolling mill wastewaters because of oil conditioning, oil spills, line ruptures, excessive dripping of lubricants, and equipment wash-down. Wastewater concentrations as high as 150 mg/l may be reached during line ruptures.

8. Salt Bath Descaling

Oxidizing and reducing are the two processes within the salt bath descaling subcategory. The oxidizing process uses highly oxidizing salt baths maintained at temperatures of 700-900°F. These salts react more aggressively with scale than with the base metal and, as a result, produce a smoother surface than acid pickling.

During the oxidizing process the steel product is placed in the oxidizing bath after being tempered. After the product has been exposed to this chemical and thermal action, it is cooled in a "cold" water tank. Together, the chemical action and the sudden cooling and steam formation cause the surface scale to crack, so that subsequent pickling operations can be more effective.

Reducing operations are similar except that they depend upon the strong reducing properties of sodium hydride (1.5 to 2 percent by weight) in a fused caustic soda bath at 700°F. Reducing operations, like oxidizing operations, are operated as integral parts of the pickling process.

9. Acid Pickling

Acid pickling is the process in which steel products are immersed in heated acid solutions to remove surface scale.

Wastewaters are generated by three major sources in pickling operations. The largest source is the rinse water used to clean the product after it has been immersed in the pickling solution. The second source is the spent pickling solution, or liquor, that has become too weak to continue to treat the steel products. The spent pickle liquor is a small volume, but is very acidic and contains high concentrations of iron and toxic metal pollutants. It is discharged intermittently. The third source is wastewater from wet fume scrubbers.

10. Cold Rolling

Cold-reduced flat rolled products are made by cold rolling pickled strip steel. The thickness of the steel is reduced by 25 to 99 percent in this operation to produce a smooth, dense surface.

The major process water use in cold rolling mills is for cooling and lubricating the rolls and the steel product. This is done with flooded lubrication systems, where a water-oil emulsion is sprayed directly on the product and rolls. Each stand usually has separate sprays and, if used, a separate recycle system. Past practice was to discharge the water-oil wastes directly to the sewer. However, the high cost of rolling oils and pollution control regulations have changed this. Recycle and recovery systems are now in common use. In fact, most of the newer cold rolling mills use recirculated oil solution systems to reduce oil use and pollutant discharges.

11. Alkaline Cleaning

Alkaline cleaning is used where vegetable, mineral, and animal fats and oils must be removed from the steel surface prior to further processing. Solutions of various compositions, concentrations, and temperatures are often used for cleaning. Electrolytic cleaning may be used for large scale production or where a cleaner product is required. The alkaline cleaning bath is a water solution of carbonates, alkaline silicates, phosphates, and sometimes wetting agents to aid cleaning.

Wastewaters are discharged from two sources in alkaline cleaning lines: the cleaning solution tank and the subsequent rinsing steps. The cleaning solution tank contains a caustic solution with high levels of sodium compounds and other components. At some lines, the cleaning solution is reused continously. Fresh solution is added to make up for dragout and evaporative losses. The baths are discharged periodically to limit the buildup of contaminants (dissolved solids and oils), or as soon as the cleaning ability of the solution is weakened. A process being developed includes an ultrafiltration system that continuously treats the alkaline cleaning solutions and allows higher reuse rates.

Because most alkaline baths are used to clean large amounts of steel, pollutants can build up to high levels. Typical levels of pollutants found in alkaline cleaning baths are shown below:

Pollutant or Wastewater Characteristic	Typical Values (mg/l)
Alkalinity	1,000
Iron, total	100
Oil & Grease	1,500
pH (units)	12-13
Total Dissolved Solids	25,000
Total Suspended Solids	1,000
Temperature	70°-200°F

The other source of wastewaters from the alkaline cleaning process is the rinse step, which follows the cleaning operation, and is required to remove residual cleaning solution from the product. Rinsing is done in spray chambers or one or several dip tanks depending upon the degree of rinsing required. Although some lines have standing rinse tanks (no continuous flow through the tanks), many lines have rinse tanks with continuous water feed and overflow to keep the rinse water cleaner and to cool the product.

12. Hot Coating

Hot coating processes involve dipping clean steel into baths of molten metal to deposit a thin layer onto the steel surface. These coatings provide desired qualities, such as resistance to corrosion, safety from contamination, or a decorative bright appearance. The two major classes of metallic coating operations in the industry are hot coating and cold coating. Zinc, terne, and aluminum coatings are most often applied from molten metal baths, while tin and chromium are usually applied electrolytically from plating solutions. Nearly all hot coating operations discharging to POTWs use the galvanizing process (zinc).

The major wastewater flows originating from hot coating operations fall into three groups:

- Continuous dilute wastewaters from rinses following chemical treatment or surface passivation steps and final product rinses after hot dipping. These waters contain suspended and dissolved solids, chlorides, sulfates, phosphates, silicates, oily matter, and varying amounts of dissolved metals (iron, zinc, chromium, lead, tin, aluminum, cadmium) depending on which coating metal is used.

- Concentrated intermittent discharges (including fluxes), chemical treatment solutions, and regenerant solutions from in-line ion exchange systems. These discharges contain higher concentrations of the pollutants noted above. Discharge volumes from these sources can be minimized by close attention to maintenance and operating conditions, and by using dragout recovery units. Hot dipped coating baths themselves are never discharged. Instead, they are recovered and continuously regenerated as part of the coating operation, or by outside contractors.

- Fume scrubber wastewaters are produced by the continuous scrubbing of vapors and mists collected from the coating steps. Scrubber wastewaters may be used as process rinses, since only volatile components are present in the air to be scrubbed. Less than 40 percent of all hot coating lines have wet fume scrubbers. A few plants have dry fume absorbers.

Many of the subcategories were further divided to account for differences in manufacturing processes and equipment. Separate limits were then developed for each subdivision.

2.2 PRETREATMENT STANDARDS FOR THE IRON AND STEEL MANUFACTURING CATEGORY

The categorical pretreatment standards for the iron and steel industry distinguish between existing sources and new sources. As a general rule, EPA establishes pretreatment standards on the basis of concentration. However, for the steel industry, the Agency believes the standards should be based upon mass limitations (kg/kkg) to ensure that effective toxic pollutant control is provided and to minimize the hydraulic impact of large volume discharges on

POTWs. These standards are expressed as maximum 30-day average and maximum daily mass limitations in kilograms per 1000 kilograms (lbs/1000 lbs) of product (except for acid pickling and hot coating operations with fume scrubbers where mass limitations are expressed in kilograms per day for each scrubber).

The pretreatment standards for existing sources (PSES), with the exception of cokemaking, are equivalent to best available technology (BAT) for direct dischargers. BAT represents the wastewater treatment processes necessary to achieve best available economic performance of wastewater treatment at plants of different ages, sizes, production rates, and other factors. The standards for cokemaking facilities are based on treatment technologies installed to pretreat cokemaking wastewater prior to on-site biological treatment. These levels of treatment include technologies for removing toxic pollutants, both by process modification and by end-of-pipe treatment, which could pass through or otherwise be incompatible with the operation of a POTW. Pretreatment standards have been developed by EPA for 10 of the 12 iron and steel subcategories. The two subcategories which do not have pretreatment standards are Subpart G - Hot Forming and Subpart K - Alkaline Cleaning. For these two subcategories, EPA has determined that there are not significant quantities of toxic pollutants to upset or pass through POTW treatment plants or limit POTW sludge management alternatives. For the 10 regulated subcategories, the limits are presented in Tables 2.1, a-f.

The pretreatment standards for new sources (PSNS) apply to iron and steel manufacturing facilities for which construction began after January 7, 1981, the date of the proposed regulation. New facilities are able to incorporate process controls that reduce pollutant loadings, so in some cases the PSNS are more stringent than PSES. The PSNS are based on the best available demonstrated technologies and for most subcategories are identical to the PSES. The exceptions are: Subpart I - Acid Pickling, Subpart J - Cold Forming, and Subpart L - Hot Coating. The PSNS for these three subcategories are presented in Tables 2.2, a-f.

TABLE 2.1a

PRETREATMENT STANDARDS FOR EXISTING SOURCES (PSES)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphthalene	Tetrachloroethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
A. Cokemaking 1. Iron and Steel[1]	Ave. Max.	0.0322 0.0645		0.0215 0.043				0.00859 0.0172				
2. Merchant[2]	Ave. Max.	0.0375 0.0751		0.025 0.0501				0.0100 0.0200				
3. Beehive*												
B. Sintering[3]	Ave. Max.	0.00501 0.0150		0.0000501 0.000100				0.00150 0.00300	0.000150 0.000451		0.000225 0.000676	
C. Ironmaking Iron	Ave. Max.	0.00292 0.00876		0.0000292 0.0000584				0.000876 0.00175	0.0000876 0.000263		0.000131 0.000394	
Ferro-manganese*												
D. Steelmaking 1. Basic Oxygen Furnace (BOF): Semi-wet*												
2. BOF: Wet-open	Ave. Max.								0.000138 0.000413		0.000207 0.000620	
3. BOF: Wet-suppressed	Ave. Max.								0.0000626 0.000188		0.0000939 0.000282	
4. Open Hearth Furnace: Wet*												

TABLE 2.1b

PRETREATMENT STANDARDS FOR EXISTING SOURCES (PSES) (Continued)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphtha-lene	Tetrachloro-ethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
5. Electric Arc Furnace (EAF): Semi-wet*												
6. EAF: Wet	Ave.								0.000138		0.000207	
	Max.								0.000413		0.000620	
E. Vacuum Degassing	Ave.								0.0000313		0.0000469	
	Max.								0.0000939		0.000141	
F. Continuous Casting	Ave.								0.0000313		0.0000469	
	Max.								0.0000939		0.000141	
G. Hot Forming**												
H. Salt Bath Descaling												
a. Oxidizing - 1. Batch, Sheet and Plate	Ave.						0.00117			0.000876		
	Max.						0.00292			0.00263		
2. Batch, Rod and Wire	Ave.						0.000701			0.000526		
	Max.						0.00175			0.00158		
3. Batch, Pipe and Tube	Ave.						0.00284			0.00213		
	Max.						0.00709			0.00638		
4. Continuous	Ave.						0.000551			0.000413		
	Max.						0.00138			0.00124		
b. Reducing - 1. Batch	Ave.						0.000542	0.000339		0.000407		
	Max.						0.00136	0.00102		0.00122		
2. Continuous	Ave.						0.00304	0.00190		0.00228		
	Max.						0.00759	0.00569		0.00683		

TABLE 2.1c

PRETREATMENT STANDARDS FOR EXISTING SOURCES (PSES) (Continued)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphthalene	Tetrachloroethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
I. Acid Pickling												
a. Sulfuric Acid Pickling -												
1. Rod, Wire,	Ave.								0.000175		0.000234	
and Coil	Max.								0.000526		0.000701	
2. Bar, Billet,	Ave.								0.0000563		0.0000751	
and Bloom	Max.								0.000169		0.000225	
3. Strip,	Ave.								0.000113		0.000150	
Sheet,	Max.								0.000338		0.000451	
and Plate												
4. Pipe, Tube,	Ave.								0.000313		0.000417	
and Other	Max.								0.000939		0.00125	
5. Fume												
Scrubber[4]	Ave.								0.0123		0.0164	
(kg/day)	Max.								0.0368		0.0491	
b. Hydrochloric Acid Pickling -												
1. Rod, Wire,	Ave.								0.000307		0.000409	
and Coil	Max.								0.000920		0.00123	
2. Strip,												
Sheet,	Ave.								0.000175		0.000234	
and Plate	Max.								0.000526		0.000701	
3. Pipe, Tube,	Ave								0.000638		0.000851	
and Other	Max.								0.00192		0.00255	
4. Fume	Ave.								0.0123		0.0164	
Scrubber[5]	Max.								0.0368		0.0491	
5. Acid Re-	Ave.								0.0819		0.109	
generation[6]	Max.								0.245		0.0327	
(Absorber vent scrubber) (kg/day)												

TABLE 2.1d

PRETREATMENT STANDARDS FOR EXISTING SOURCES (PSES) (Continued)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphthalene	Tetrachloroethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
c. Combination Acid Pickling												
1. Rod, Wire, and Coil	Ave.						0.000852			0.000638		
	Max.						0.00213			0.00192		
2. Bar, Billet, and Bloom	Ave.						0.000384			0.000288		
	Max.						0.000960			0.000864		
3. Strip, Sheet, and Plate - Continuous	Ave.						0.00250			0.00188		
	Max.						0.00626			0.00563		
4. Strip, Sheet, and Plate - Batch	Ave.						0.000768			0.000576		
	Max.						0.00192			0.00173		
5. Pipe, Tube, and Other	Ave.						0.00129			0.000964		
	Max.						0.00322			0.00289		
6. Fume Scrubber (kg/day)	Ave.						0.0327			0.0245		
	Max.						0.0819			0.0735		
J. Cold Forming[7]												
a. Cold Rolling												
1. Recirculation, Single Stand	Ave.						0.0000084		0.0000031	0.0000063	0.0000021	
	Max.				0.0000021	0.0000031	0.0000209		0.0000094	0.0000188	0.0000063	
2. Recirculation, Multiple Stands	Ave.				0.0000104	0.0000156	0.0000418		0.0000156	0.0000313	0.0000104	
	Max.						0.000104		0.0000469	0.0000939	0.0000313	
3. Combination	Ave.						0.000501		0.000188	0.000376	0.000125	
	Max.				0.000125	0.000188	0.00125		0.000563	0.00113	0.000376	

TABLE 2.1e

PRETREATMENT STANDARDS FOR EXISTING SOURCES (PSES) (Continued)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphthalene	Tetrachloroethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
4. Direct Application, Single Stand	Ave.						0.000150		0.0000563	0.000113	0.0000376	
	Max.				0.0000376	0.0000563	0.000376		0.000169	0.000338	0.000113	
5. Direct Application, Multiple Stand	Ave.						0.000668		0.000250	0.000501	0.000167	
	Max.				0.000167	0.000250	0.00167		0.000751	0.00150	0.000501	
b. Cold Worked Pipe and Tube Mills*												
K. Alkaline Cleaning**												
L. Hot Coating a. Galvanizing and Other Coatings - Strip, Sheet, and Misc.	Ave.								0.000376		0.00050	0.0000501
	Max.								0.00113		0.00150	0.000150
b. Galvanizing - Wire Products and Fasteners	Ave.								0.00150		0.00200	0.000200
	Max.								0.00451		0.00601	0.000601
c. Fume Scrubbers (kg/day)	Ave.								0.0123		0.0164	0.00163
	Max.								0.0368		0.0491	0.00490

Ave. = Average of daily values for 30 consecutive days
Max. = Maximum for any one day

*This subpart is reserved.

**No numerical limits were established for this subcategory. However, they are subject to the General Pretreatment Regulations in 40 CFR 403.

TABLE 2.1f

PRETREATMENT STANDARDS FOR EXISTING SOURCES (PSES) (Continued)

[1] Increased loadings, not to exceed 24 percent of these standards, are allowed for by-product coke plants that have wet desulfurization systems, but only to the extent that such systems generate an increased effluent volume. Increased loadings, not to exceed 58 percent of these standards, are allowed for by-product coke plants that have indirect ammonia recovery systems, but only to the extent that such systems generate an increased effluent volume.

[2] Increased loadings, not to exceed 21 percent of these standards are allowed for by-product coke plants that have wet desulfurization systems, but only to the extent that such systems generate an increased effluent volume. Increased loadings, not to exceed 50 percent of these standards, are allowed for by-product coke plants that have indirect ammonia recovery systems, but only to the extent that such systems generate an increased effluent volume.

[3] The standards for ammonia-N, cyanide, and phenols (4AAP) are applicable only when sintering wastewater is treated along with ironmaking wastewater.

[4] These limits apply to each fume scrubber associated with sulfuric acid pickling operations.

[5] These limits apply to each fume scrubber associated with hydrochloric acid pickling operations.

[6] These limits apply to absorber vent scrubber wastewater associated with hydrochloric acid regeneration plants.

[7] For processes regulated by Subpart J, the limits on chromium and nickel apply in lieu of the limits on lead and zinc when cold rolling wastewaters are treated with descaling or combination acid pickling waters.

[8] Discharges from these operations to Publicly Owned Treatment Works are prohibited.

TABLE 2.2a

PRETREATMENT STANDARDS FOR NEW SOURCES (PSNS)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphthalene	Tetrachloroethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
A. Cokemaking												
1. Iron and Steel[1]	Ave.	0.0322		0.0215				0.00859				
	Max.	0.0645		0.043				0.0172				
2. Merchant[2]	Ave.	0.0375		0.025				0.0100				
	Max.	0.0751		0.0501				0.0200				
3. Beehive*												
B. Sintering[3]	Ave.	0.00501		0.0000501				00.00501	0.000150		0.000225	
	Max.	0.0150		0.000100				0.00100	0.000451		0.000676	
C. Ironmaking												
1. Iron	Ave.	0.00292		0.0000292				0.000292	0.0000730		0.0000876	
	Max.	0.00876		0.0000584				0.000584	0.000219		0.000263	
2. Ferro-manganese*												
D. Steelmaking												
1. Basic Oxygen Furnace (BOF): Semi-wet*												
2. BOF: Wet-open	Ave.								0.000138		0.000207	
	Max.								0.000413		0.000620	
3. BOF: Wet-suppressed	Ave.								0.0000626		0.0000939	
	Max.								0.000188		0.000282	
4. Open Hearth Furnace: Wet*												

TABLE 2.2b

RETREATMENT STANDARDS FOR NEW SOURCES (PSNS) (Continued)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphtha-lene	Tetrachloro-ethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
5. Electric Arc Furnace (EAF): Semi-wet*												
6. EAF: Wet	Ave. Max.								0.000138 0.000413		0.000207 0.000620	
E. Vacuum Degassing	Ave. Max.								0.0000313 0.0000939		0.0000469 0.000141	
F. Continuous Casting	Ave. Max.								0.0000313 0.0000939		0.0000469 0.000141	
G. Hot Forming**												
H. Salt Bath Descaling												
a. Oxidizing - 1. Batch, Sheet and Plate	Ave. Max.						0.00117 0.00292			0.000876 0.00263		
2. Batch, Rod and Wire	Ave. Max.						0.000701 0.00175			0.000526 0.00158		
3. Batch, Pipe and Tube	Ave. Max.						0.00284 0.00709			0.00213 0.00638		
4. Continuous	Ave. Max.						0.000551 0.00138			0.000413 0.00124		
b. Reducing - 1. Batch	Ave. Max.						0.000542 0.00136	0.000339 0.00102		0.000407 0.00122		
2. Continuous	Ave. Max.						0.00304 0.00759	0.00190 0.00569		0.00228 0.00683		

TABLE 2.2c

PRETREATMENT STANDARDS FOR NEW SOURCES (PSNS) (Continued)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphthalene	Tetrachloroethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
I. Acid Pickling a. Sulfuric Acid Pickling - 1. Rod, Wire, and Coil	Ave. Max.								0.0000313 0.0000939		0.0000417 0.000125	
2. Bar, Billet, and Bloom	Ave. Max.								0.0000188 0.0000563		0.0000250 0.0000751	
3. Strip, Sheet, and Plate	Ave. Max.								0.0000250 0.0000751		0.0000334 0.000100	
4. Pipe, Tube, and Other	Ave. Max.								0.0000438 0.000131		0.0000584 0.000175	
5. Fume Scrubber[4] (kg/day)	Ave. Max.								0.0123 0.0368		0.0164 0.0491	
b. Hydrochloric Acid Pickling - 1. Rod, Wire, and Coil	Ave. Max.								0.0000376 0.000113		0.0000501 0.0000150	
2. Strip, Sheet, and Plate	Ave. Max.								0.0000250 0.0000751		0.0000334 0.000100	
3. Pipe, Tube, and Other	Ave Max.								0.0000688 0.000206		0.0000918 0.000275	
4. Fume Scrubber[5] (kg/day)	Ave. Max.								0.0123 0.0368		0.0164 0.0491	

TABLE 2.2d

PRETREATMENT STANDARDS FOR NEW SOURCES (PSNS) (Continued)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphtha-lene	Tetrachloro-ethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
c. Combination Acid Pickling												
1. Rod, Wire, and Coil	Ave.						0.000117			0.0000876		
	Max.						0.000292			0.000263		
2. Bar, Billet, and Bloom	Ave.						0.0000667			0.0000501		
	Max.						0.000167			0.000150		
3. Strip, Sheet, and Plate - Continuous	Ave.						0.000284			0.000213		
	Max.						0.000710			0.000638		
4. Strip, Sheet, and Plate - Batch	Ave.						0.000100			0.0000751		
	Max.						0.000250			0.000225		
5. Pipe, Tube, and Other	Ave.						0.000167			0.000125		
	Max.						0.000418			0.000376		
6. Fume Scrubber (kg/day)	Ave.						0.0327			0.0245		
	Max.						0.0819			0.0735		
J. Cold Forming[6]												
a. Cold Rolling												
1. Recirculation, Single Stand	Ave.						0.0000084		0.0000031	0.0000063	0.0000021	
	Max.				0.0000021	0.0000031	0.0000209		0.0000094	0.0000188	0.0000063	
2. Recirculation, multiple Stands	Ave.						0.0000167		0.0000063	0.0000125	0.0000042	
	Max.				0.0000042	0.0000063	0.0000418		0.0000188	0.0000376	0.0000125	
3. Combination	Ave.						0.000217		0.0000814	0.000163	0.0000542	
	Max.				0.0000542	0.0000813	0.000543		0.000244	0.000488	0.000163	

TABLE 2.2e

PRETREATMENT STANDARDS FOR NEW SOURCES (PSNS) (Continued)

POLLUTANT LIMITS (in kg/Kkg of product unless otherwise noted)

Subpart		Ammonia	Chlorine	Phenol (4AAP)	Naphthalene	Tetrachloroethylene	Chromium	Cyanide (Total)	Lead	Nickel	Zinc	Hexavalent Chromium
4. Direct Application, Single	Ave.						0.0000418		0.0000156	0.0000313	0.0000104	
	Max.				0.0000104	0.0000156	0.000104		0.0000469	0.0000939	0.0000313	
5. Direct Application, Multiple Stand	Ave.						0.000484		0.000182	0.000363	0.000121	
	Max.				0.000121	0.000182	0.00121		0.000545	0.00109	0.000363	
b. Cold Worked Pipe and Tube Mills[7]												
K. Alkaline Cleaning**												
L. Hot Coating a. Galvanizing and Other Coatings - Strip, Sheet, and Misc.	Ave.								0.0000939		0.000125	0.0000125
	Max.								0.000282		0.000376	0.0000376
b. Galvanizing - Wire Products and Fasteners	Ave.								0.000376		0.00050	0.0000501
	Max.								0.00113		0.00150	0.000150
c. Fume Scrubbers (kg/day)	Ave.								0.0123		0.0164	0.00163
	Max.								0.0368		0.0491	0.00490

Ave. = Average of daily values for 30 consecutive days
Max. = Maximum for any one day

*This subpart is reserved.

**No numerical limits were established for this subcategory. However, they are subject to the General Pretreatment Regulations in 40 CFR 403.

TABLE 2.2f

PRETREATMENT STANDARDS FOR NEW SOURCES (PSNS) (Continued)

[1]Increased loadings, not to exceed 24 percent of these standards, are allowed for by-product coke plants that have wet desulfurization systems, but only to the extent that such systems generate an increased effluent volume. Increased loadings, not to exceed 58 percent of these standards, are allowed for by-product coke plants that have indirect ammonia recovery systems, but only to the extent that such systems generate an increased effluent volume.

[2]Increased loadings, not to exceed 21 percent of these standards are allowed for by-product coke plants that have wet desulfurization systems, but only to the extent that such systems generate an increased effluent volume. Increased loadings, not to exceed 50 percent of these standards, are allowed for by-product coke plants that have indirect ammonia recovery systems, but only to the extent that such systems generate an increased effluent volume.

[3]The standards for ammonia-N, cyanide, and phenols (4AAP) are applicable only when sintering wastewater is treated along with ironmaking wastewater.

[4]These limits apply to each fume scrubber associated with sulfuric acid pickling operations.

[5]These limits apply to each fume scrubber associated with hydrochloric acid pickling operations.

[6]For processes regulated by Subpart J, the limits on chromium and nickel apply in lieu of the limits on lead and zinc when cold rolling wastewaters are treated with descaling or combination acid pickling waters.

[7]Discharges from these operations to Publicly Owned Treatment Works are prohibited.

2.3 RELATIONSHIP TO ELECTROPLATING AND METAL FINISHING

In certain cases there may be some question regarding whether a production process is covered by Iron and Steel Categorical pretreatment standards or Metal Finishing pretreatment standards. For iron and steel manufacturing operations also covered by metal finishing, the more specific standards apply, i.e., iron and steel.

For example, if a plant performs pickling and electroplating at an iron and steel then the metal finishing PSES apply only to the discharge from electroplating while the iron and steel PSES apply to the discharge from the surface preparation operation of pickling. Normally, the metal preparation operation (pickling), would be subject to the metal finishing regulation, however, because the iron and steel regulations specifically include this operation performed in iron and steel mills, the iron and steel regulation takes precedence for this wastestream.

2.4 POLLUTANTS EXCLUDED FROM REGULATION

The EPA excluded from relation 81 of the 126 toxic pollutants that are given priority consideration. These pollutants are found either in a small number of sources and are uniquely related to those sources, or are detected in the effluent in trace quantities, which are not likely to cause toxic effects. These 81 pollutants are presented in Table 2.3.

2.5 COMPLIANCE DATES

In accordance with the settlement agreement, all existing industries engaged in the manufacture of steel must comply with the Iron and Steel Categorical pretreatment standards, by July 10, 1985 except for those facilities identified in the regulations as being considered under separate rulemaking for central waste treatment facilities. All new steel manufacturing facilities must comply with pretreatment standards at the time discharge commences.

TABLE 2.3

POLLUTANTS EXCLUDED FROM IRON AND STEEL REGULATION

Pollutant	Unique Occurrence	Trace Quantities
1,2-Dichloroethane		X
1,1,2-Trichloroethane	X	
1,1,2,2-Tetrochloroethane		X
2-Chloronaphthalene		X
2,4,6-Trichlorophenol		X
2-Chlorophenol		X
1,2-Dichlorobenzene		X
1,4-Dichlorobenzene		X
1,1-Dichloroethylene	X	
1,2-Transdichloroethylene		X
2,4-Dichlorophenol		X
1,2-Diphenythydrazene		X
Methylenechloride		X
Dichlorobromomethane		X
Isophorone		X
Nitrobenzene		X
2-Nitrophenol		X
2,4-Dinitrophenol		X
3,4-Benzofluoranthene	X	
Benzo(K)fluoranthene	X	
Benzo(ghi)perylene	X	
Dibenzo(a,h)-anthracene	X	
Indeno(1,2,3 cd)pyrene	X	
Vinyl Chloride	X	
Aldrin	X	
Diedrin	X	
Chlordane	X	
4,4-DDT	X	
4,4-DDE	X	
4,4-DDD	X	
a-endosulfan-Alpha	X	
b-endosulfan-Beta	X	
Endosulfan sulfate	X	
Endrin	X	
Endrin aldehyde	X	
Heptachlor	X	
Heptachlorepoxide	X	
a-BHC-Alpha	X	
b-BHC-Beta	X	
r-BHC-Gamma	X	
g-BHC-Delta	X	
PCB-1242	X	
PCB-1254	X	
PCB-1221	X	

TABLE 2.3

POLLUTANTS EXCLUDED FROM IRON AND STEEL REGULATION (Continued)

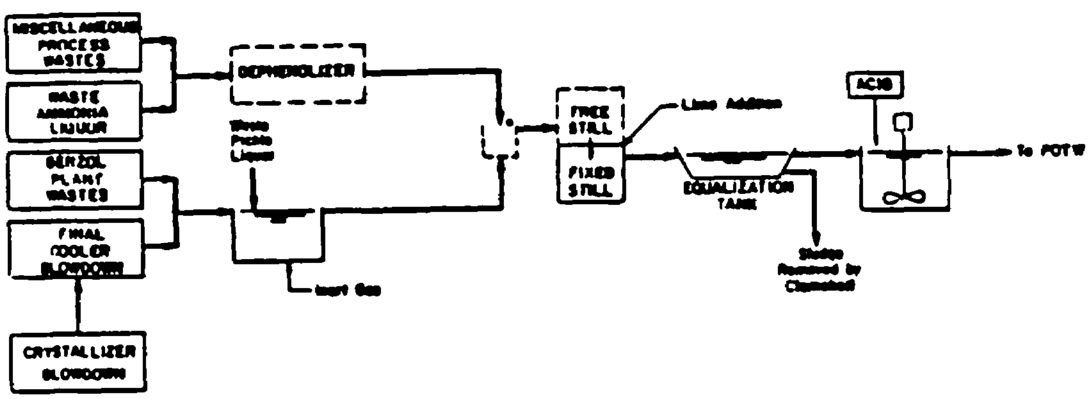
Pollutant	Unique Occurrence	Trace Quantities
PCB-1232	X	
PCB-1248	X	
PCB-1260	X	
PCB-1016	X	
Toxaphene	X	
Beryllium		X
Mercury		X
Manganese	X	

3. TREATMENT TECHNOLOGIES

The treatment technologies described in this section are currently used by iron and steel manufacturers to remove wastewater pollutants generated by industrial processes. The technologies are grouped according to the subcategories where they are used, and include oil skimming, metals precipitation, sedimentation, steam distillation, solvent extraction, thickening and vacuum dewatering.

3.1 TREATMENT OF COKEMAKING WASTES

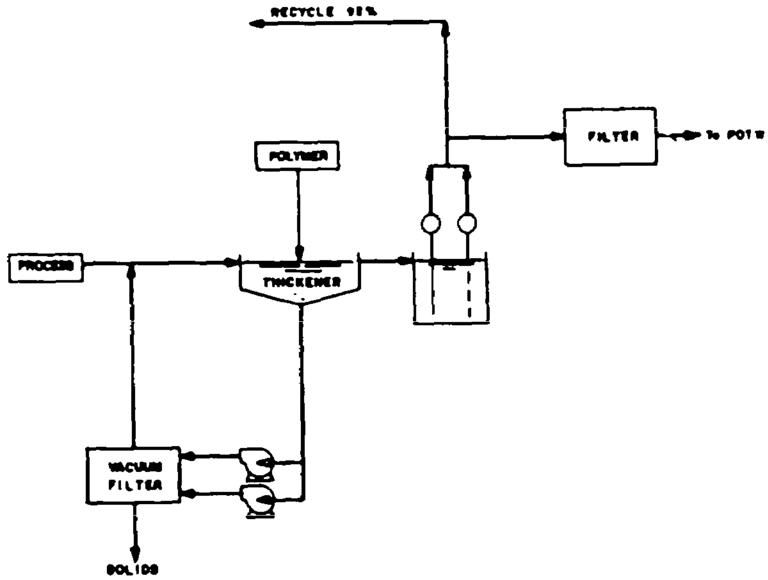
Treatment of wastewaters from this subcategory can be accomplished with a system such as that illustrated below.



With this system, process wastewaters are mixed with waste ammonia liquor and enter a dephenolizer, which recovers phenolic compounds. The benzol plant wastes and final cooler blowdown are initially treated in a gas flotation unit where waste pickle liquor is used to break emulsions and an inert gas mixture is introduced to enhance the separation of oils and greases. The above two waste streams are then combined, free ammonia is stripped and recovered and lime or caustic soda is added to raise the pH to 11 or 12. Fixed ammonia stripping is used to remove as much ammonia as possible prior to further treatment. Wastes are then retained in an equalization/sedimentation basin with approximately one day's retention time. Unreacted lime particles and other suspended matter separates out, and is periodically removed by clamshell bucket or transferred to vacuum filters. The overflow from the basin is then neutralized and aerated prior to discharge to the POTW.

3.2 TREATMENT OF SINTERING WASTES

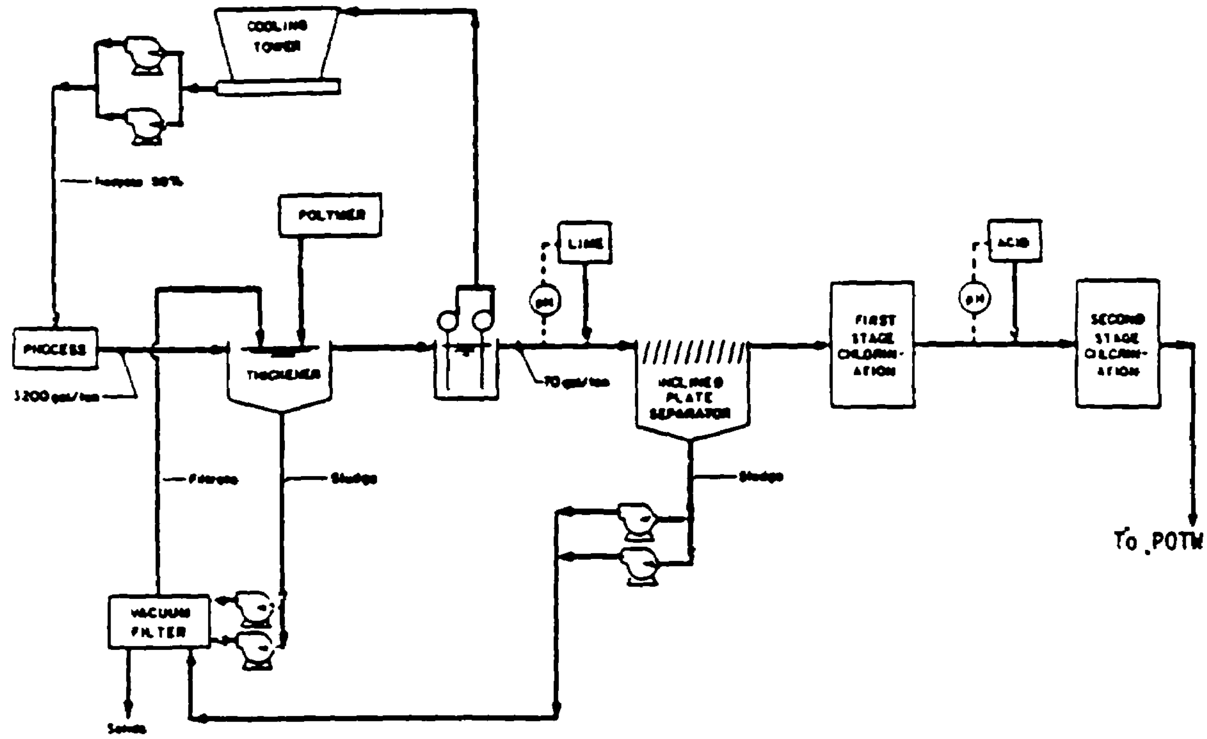
Sintering process wastewaters result from dust and gas scrubbing equipment and from sinter cooling. The common practice is to combine wastewater streams for treatment. A treatment system suitable for meeting pretreatment limitations for this subcategory is diagrammed below.



With this system process wastewaters enter a thickener where oils and grease are removed by skimming and solids are settled with the aid of a polymer. Sludge removed from the thickener is dewatered on a vacuum filter. Ninety-two percent of the thickener effluent is returned to the process. Wastewater is discharged from the system after pressure filtration or metals precipitation.

3.3 TREATMENT OF IRONMAKING WASTES

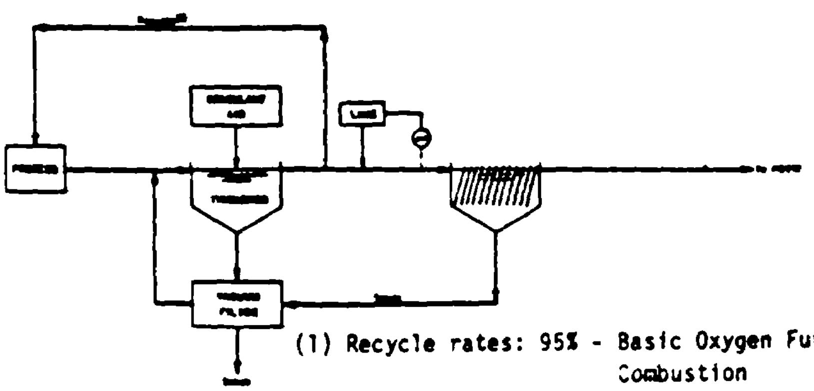
Prior to the mid-1970s, treatment of ironmaking wastewaters involved removal of suspended solids by sedimentation, aided by flocculating agents to improve removal rates. These clarified wastewaters were discharged without further treatment. Today, about 90 percent of blast furnace wastewater treatment systems include recycling (after the thickener), and discharge only a relatively small percentage (generally 5 to 10 percent) of the process flow. Cooling towers are often used to lower the temperature of recycled waste. The thickener underflows are typically dewatered with the filtrate returned to the thickener influent. The dewatered solids are either sent to sintering operations or to off-site disposal. A typical wastewater treatment system for meeting pretreatment regulations is diagrammed below.



In addition to the solids removal and recycle technologies, treatment includes a two-stage chlorination process to destroy cyanide and to oxidize phenols and ammonia. Following chlorination a reducing agent such as sulfur dioxide is added to remove residual chlorine.

3.4 TREATMENT OF STEELMAKING WASTES

Wastewater treatment for discharges from this subcategory can be accomplished with a system such as that diagrammed below.

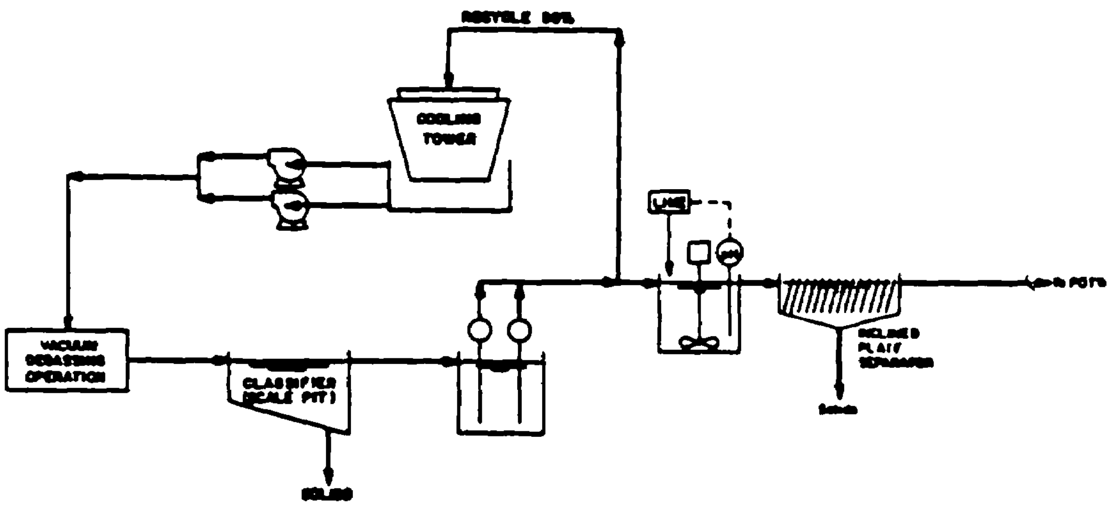


(1) Recycle rates: 95% - Basic Oxygen Furnace - Suppressed Combustion
90% - Basic Oxygen Furnace - Open Combusti

Wastewater initially enters a thickener, which reduces suspended solids with the aid of a polymer or other coagulant aid. The solids are removed and thickened on a vacuum filter. A major portion of the effluent from the thickener is recycled to the process; the remainder flows to an inclined plate separator after lime is added for removal of toxic metals.

3.5 TREATMENT OF VACUUM DEGASSING WASTES

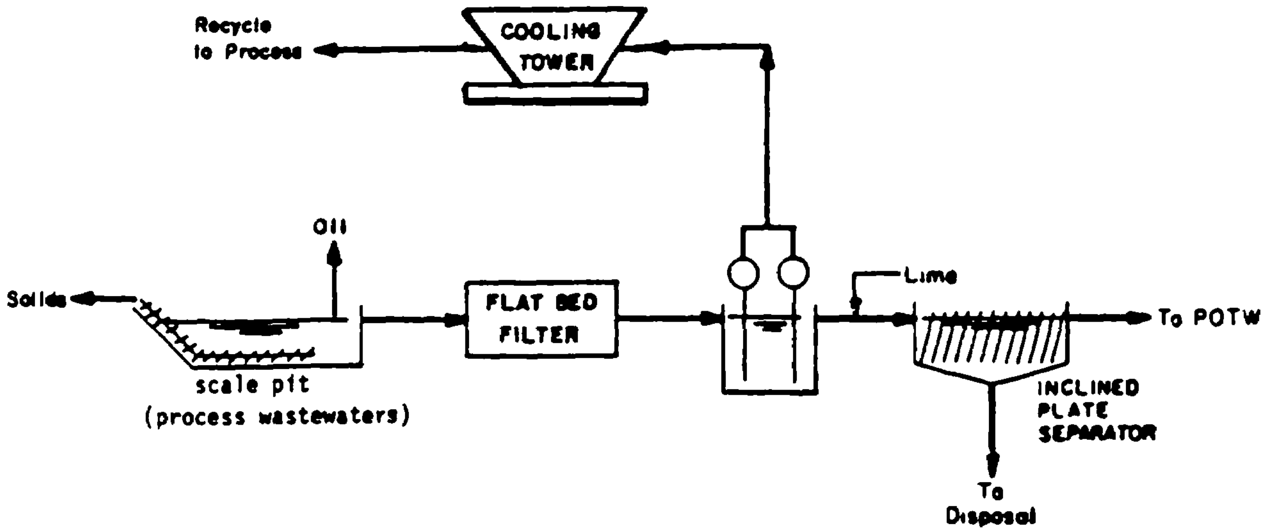
A wastewater treatment system capable of meeting pretreatment regulations for this subcategory is diagrammed below.



The first step in the pretreatment process involves gravity sedimentation in a scale pit to remove suspended solids. The effluent from the scale pit flows to a sump and is either recycled to the process through a cooling tower or is treated with lime to precipitate metals. Wastewater is discharged after solids and toxic metals are removed by lime precipitation and clarification in an inclined plate separator.

3.6 TREATMENT OF CONTINUOUS CASTING WASTES

The pretreatment standards for this subcategory can be met using the treatment system diagrammed below.



The process wastewaters first enter a scale pit where solids are removed by sedimentation and oil is skimmed. A flat bed filter is then used for additional solids removal (a pressure filter is recommended for meeting PSNS). About 96 percent of the filter effluent is returned to the process; the rest is treated with lime to precipitate metals in an inclined plate separator.

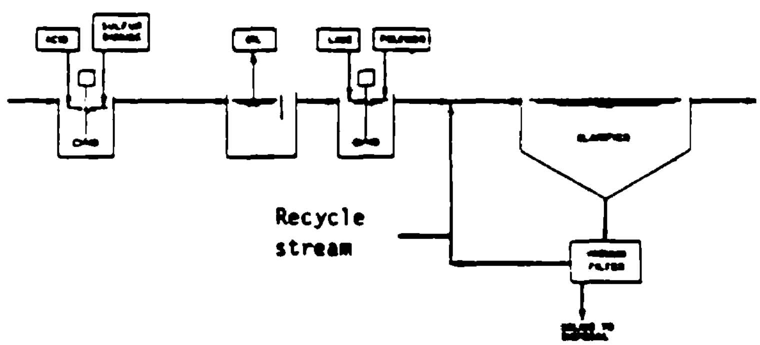
3.7 TREATMENT OF HOT FORMING WASTES

About 20 hot forming operations discharge wastewaters to POTWs. In many cases, these wastewaters are recycled to minimize user fees to the industry and to avoid hydraulically overloading POTWs. EPA believes that future discharges to POTWs from hot forming operations, if any, will receive similar treatment and will not contain high levels of toxic metals. The Agency believes that the pass-through of toxic pollutants from hot forming operations is not a problem. Thus, categorical pretreatment standards for hot forming wastewaters were not promulgated.

3.8 TREATMENT OF SALT BATH DESCALING WASTES

Wastewaters are generated at two points in oxidizing operations: in the salt bath tank and in the rinse steps after it. The bath is a molten salt solution that contains high levels of sodium compounds and other components. The solution stays in the bath for a long time before being replaced. Because of its highly contaminated nature and relatively small volume, this spent salt solution waste is generally hauled off-site for disposal by private contractors. These salt solutions are treated at some plants by bleeding a small volume of the waste solution into the pretreatment system over a period of hours or days.

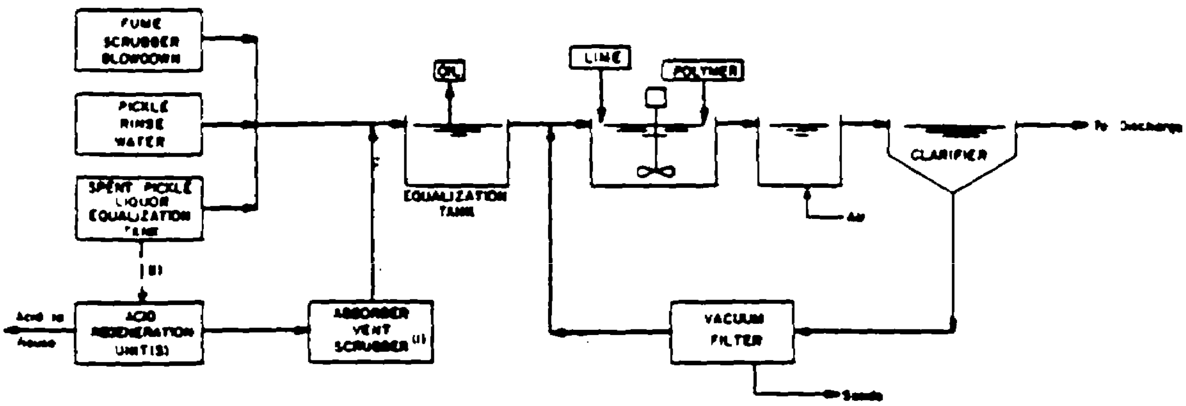
The other source of wastewater from oxidizing operations is the rinse step that follows the descaling operation. This is the primary wastewater source regulated by EPA. Wastewaters are produced in the same way for reducing operations. Also, oxidizing operations are the main concern of POTWs since they far outnumber reducing operations. The pretreatment of these wastewaters can be accomplished with the following system.



Using this process, wastewater is treated with acid and sulfur dioxide to reduce hexavalent chromium to trivalent chromium. The effluent from the chromium reduction process first is treated by skimming to remove floating oil and solids and then metals are precipitated in a clarifier using lime and a polymer. Solids are dewatered with a vacuum filter.

3.9 TREATMENT OF ACID PICKLING WASTES

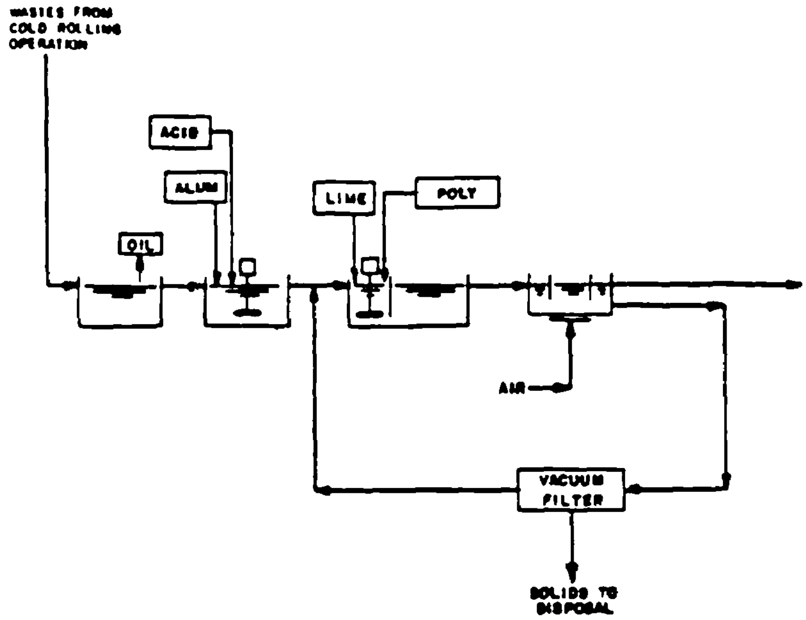
The system described below is capable of meeting PSES. A more complex system would be needed to meet PSNS.



The several waste streams are combined in an equalization tank where oils are skimmed. The wastewater is then treated with lime and a polymer and aerated to oxidize iron from the ferrous to ferric state. Next, it enters a clarifier to settle out solids and toxic metals, which are dewatered on a vacuum filter.

3.10 TREATMENT OF COLD ROLLING WASTES

Treatment of wastewaters from this subcategory can be met using the following system:



The treatment process includes oil removal and solids removal. Floating oil is removed, then alum and acid are added to break emulsions. Solids and oil are removed by air flotation following lime and polymer addition. A vacuum filter is used to dewater solids.

3.11 TREATMENT OF ALKALINE CLEANING WASTES

Wastewaters from alkaline cleaning operations are relatively clean compared to wastewaters from other steel industry operations. Toxic pollutants are present in untreated alkaline cleaning wastewater only at levels below or near treatability levels. EPA has not promulgated numerical pretreatment standards for this subcategory.

3.12 TREATMENT OF HOT COATING WASTES

Pretreatment of galvanizing wastewaters can be achieved with a system similar to that discussed under waste treatment for the Salt Bath Descaling subcategory.

4. REQUIREMENTS OF THE GENERAL PRETREATMENT REGULATIONS

4.1 INTRODUCTION

The section provides a brief overview of the General Pretreatment Regulations and identifies those provisions of the Regulations that have a direct bearing on the application and enforcement of Categorical Pretreatment Standards for the Iron and Steel Manufacturing category.

The General Pretreatment Regulations for Existing and New Sources (40 CFR Part 403) establish the framework and responsibilities for implementation of the National Pretreatment Program. The effect of 40 CFR Part 403 is essentially three-fold. First, the General Pretreatment Regulations establish general and specific discharge prohibitions as required by Section 307(b) and (c) of the Clean Water Act. The general and specific prohibitions are described in Section 403.5 of the Pretreatment Regulations. they apply to all nondomestic sources introducing pollutants into a POTW whether or not the source is subject to Categorical Pretreatment Standards.

Second, the General Pretreatment Regulations establish an administrative mechanism to ensure that National Pretreatment Standards (Prohibited Discharge Standards and Categorical Pretreatment Standards) are applied to and enforced against industrial users. Approximately 1,500 POTWs are required to develop a locally run pretreatment program to ensure that nondomestic users comply with applicable pretreatment standards and requirements.

Third, and most importantly for the purpose of this guidance manual, the General Pretreatment Regulations contain provisions relating directly to the implementation and enforcement of the Categorical Pretreatment Standards. They include the combined wastestream formula, reporting requirements, local limits, monitoring or sampling requirements, and category determination provisions. POTW representatives should refer to 40 CFR Part 403 for specific language and requirements where appropriate.

4.2 CATEGORY DETERMINATION REQUEST

An existing industrial user (IU) or its POTW may request written certification from EPA or the delegated State specifying whether the industrial user falls within a particular industry category or subcategory and is subject to a categorical pretreatment standard. The deadline for submitting a category determination request by existing industrial users subject to the Iron and Steel Manufacturing categorical pretreatment standards has passed. A new industrial user or its POTW may request this certification for a category determination any time prior to commencing its discharge. The contents of a category determination request and procedures for review are presented in Section 403.6(a) of the General Pretreatment Regulations.

4.3 MONITORING AND REPORTING REQUIREMENTS OF THE GENERAL PRETREATMENT REGULATIONS

In addition to the requirements contained in the Iron and Steel Manufacturing categorical pretreatment standards, industrial users subject to these standards must fulfill the reporting requirements in Section 403.12 of the General Pretreatment Regulations. These requirements include the submission of baseline monitoring reports, compliance schedules, compliance reports (initial and periodic), notices of slug loading, and recordkeeping. Each reporting requirement is summarized briefly below.

4.3.1 Baseline Monitoring Reports

All industrial users subject to categorical pretreatment standards must submit a baseline monitoring report (BMR) to the Control Authority. The purpose of the BMR is to provide information that the Control Authority needs to document the industrial user's current status of compliance with a categorical pretreatment standard. The Control Authority is defined as the POTW if it has an approved pretreatment program; otherwise the BMR will be submitted to the State (if the State has an approved State Pretreatment Program) or to the EPA Region. Additional guidance on BMR reporting is available from the EPA Regional Pretreatment Coordinator.

BMR Due Dates

Section 403.12(b) requires that BMRs be submitted to the Control Authority within 180 days after the effective date of a Categorical Pretreatment Standard or 180 days after the final administrative decision made on a category determination request [403.6(a)(4)], whichever date is later. BMRs for industries regulated by the Iron and Steel Manufacturing standards were due January 6, 1983.

BMR Content

A BMR must contain the following information as required by Section 403.12(b):

1. Name and address of the facility and names of operator(s) and owner(s).

2. List of all environmental control permits held by or for the facility.

3. Brief description of the nature, average production rate, and SIC code for each of the operation(s) conducted, including a schematic process diagram that indicates points of discharge from the regulated processes to the POTW.

4. Flow measurement information for regulated process streams discharged to the municipal system. Flow measurements of other wastestreams will be necessary if application of the combined wastestream formula is necessary.

5. Identification of the pretreatment standards applicable to each regulated process and results of measurements of pollutant masses. All samples must be representative of daily operations and results reported must include values for daily maximum and average concentration (or mass, where required). If the flow of the regulated stream being sampled is less than or equal to 250,000 gallons per day, the industrial user must take three samples within a two week period. If the flow of the stream is greater than 250,000 gallons per day, the industrial user must take six samples within a two week period. If samples cannot be taken immediately downstream from the regulated process and other wastewaters are mixed with the regulated process, the industrial user should measure flows and concentrations of the other wastestreams sufficiently to allow use of the combined wastestream formula.

6. Statement of certification concerning compliance or noncompliance with the Pretreatment Standards.

7. If not in compliance, a schedule must be submitted with the BMR that describes the actions the user will take and a timetable for completing those actions to achieve compliance. This compliance schedule must contain specific increments of progress in the form of dates for the commencement and completion of major events. However, no increment of the schedule shall exceed 9 months. Within 14 days of each completion date in the schedule, the industrial user shall submit a progress report to the Control Authority indicating whether it complied with the increment of progress to be met on such date, or, if not, the date on which it expects to comply and the steps being taken to return to the schedule.

4.3.2 Report on Compliance

Within 90 days after the compliance date for the Iron and Steel Manufacturing pretreatment standards or, in the case of a new source, following commencement of the introduction of wastewater into the POTW, any industrial user subject to the standards must submit to the Control Authority a report on compliance that states whether applicable pretreatment standards are being consistently met. The report must also indicate the nature and mass of all regulated pollutants in the facility's regulated process wastestreams. If the facility is not in compliance, the report must explain the additional operation and maintenance and/or pretreatment that will be necessary to achieve compliance (see 40 CFR 403.12(d)).

4.3.3 Periodic Reports on Continued Compliance

Unless required more frequently by the Control Authority, all industrial users subject to the Iron and Steel Manufacturing categorical pretreatment standards must submit a semiannual periodic compliance report in the months of June and December (or other months specified by the Control Authority). The report shall indicate the nature and masses of the regulated pollutants in the IU's discharge to the POTW, the average and maximum daily flow rates of the facility, the methods used to sample and analyze the wastewater, and a certification that the sampling and analytical methods conform to those methods outlined in the regulations (see 40 CFR 403.12(e)).

4.3.4 Notice of Slug Loading

Section 403.12(f) requires industrial users to immediately notify the POTW of a slug load of any pollutant released to the POTW, including oxygen demanding pollutants (BOD, etc.) that may cause interference at the POTW.

4.3.5 Monitoring and Analysis to Demonstrate Continued Compliance

Section 403.12(g) states that the frequency of monitoring to demonstrate continued compliance shall be prescribed in the applicable pretreatment standard. The Iron and Steel Manufacturing pretreatment standards do not establish any monitoring frequency. Therefore, the appropriate Control Authority must establish monitoring frequency to adequately demonstrate that indirect dischargers subject to the pretreatment standards comply with them. Unless otherwise noted in the appropriate paragraph of Section 403.12, the monitoring frequency established by the Control Authority shall be used in the baseline monitoring report (403.12(b)(5)), the report on compliance with categorical pretreatment standard deadline (403.12(d)), and the periodic reports on continued compliance (403.12(e)).

Sampling and analysis shall be conducted in accordance with the procedures established in 40 CFR Part 136 and any amendments to it or shall be approved by EPA. When Part 136 techniques are not available or are inappropriate for any pollutant, then sampling and analysis shall be conducted in accordance with procedures established by the POTW or other validated procedure. All procedures for sampling and analysis not included in Part 136 must be approved by EPA.

4.3.6 Signatory Requirements for Industrial User Reports

All reports submitted by industrial users (BMRs, initial reports on compliance, periodic reports, etc.) must be signed by an authorized representative of the company in accordance with Section 403.12(k).

4.3.7 Recordkeeping Requirements

Any industrial user subject to the reporting requirements of the General Pretreatment Regulations shall maintain records of all information that results from any monitoring activities required by 403.12 for a minimum of three years [403.12(n)]. These records shall be available for inspection and copying by the Control Authority.

4.4 APPLICATION OF COMBINED WASTESTREAM FORMULA

One provision of the General Pretreatment Regulations that will often be used by POTWs and industries to properly monitor and report on compliance with categorical pretreatment standards is the Combined Wastestream Formula (CWF) [40 CFR 403.6(e)]. The CWF is a mechanism for calculating appropriate limits specified in applicable regulations for wastewater in which process wastestreams are mixed with effluent. The CWF is applied to the mixed effluent to account for the presence of the additional wastestreams.

As part of the Settlement reflected in the May 17, 1984 amendment, the preamble (49 FR 21027) states that mass-based limits (mass/day) should be applied to integrated facilities covered by production-based standards only and a combination of production-based and concentration-based standards.

The following definitions and conditions are important to the proper use of CWF.

Definitions

- Regulated Process Wastestream - industrial process wastestream regulated by National Categorical Pretreatment Standards.

- Unregulated Process Wastestream - industrial process wastestream that is not regulated by a categorical standard.

- Dilute Wastestream - boiler blowdown, sanitary wastewater, noncontact cooling water blowdown, and Paragraph 8 excluded wastestreams containing none or only a trace amount of the regulated pollutant.

Note: These definitions apply to individual pollutants. A wastestream from a process may be "regulated" for one pollutant and "unregulated for another. In addition, the May 17, 1984 amendment to the CWF allows the Control Authority to exercise its discretion to determine whether boiler blowdown and noncontact cooling streams are dilution or unregulated process streams.

- Concentration-based Limit - limit based on the relative strength of a pollutant in a wastestream. usually expressed in mg/l (lb/gal).

- Production-based Limit - limit based on the actual quantity of a pollutant in a wastestream, usually expressed in kg/some unit of production for a given operation, such as square meter (lb/square foot per operation).

- Mass-based Limit - Limit based on the actual quantity of a pollutant in a wastestream and the wastestream volume, usually expressed in kg/day (lb/day).

4.4.1 CWF Conditions

To ensure propoer application of the CWF, the following conditions must be met by a municipality and its industries [40 CFR 403.6(e)]:

- Alternative discharge limits that are calculated in place of a categorical pretreatment standard must be enforceable as categorical standards.
- Calculation of alternative limits must be performed by the Control Authority (POTW) or by the industrial user with written permission from the POTW.
- Alternative limits must be established for all regulated pollutants in each of the regulated processes.
- Both daily maximum and long-term average (usually monthly) alternative limits must be calculated for each regulated pollutant.
- Alternative limits must be established for all regulated pollutant in each of the regulated processes.
- If process changes at an industry warrant, the Control Authority may recalculate the alternative limits at its discretion or at the request of the industrial user. The new alternative limits must be calculated and become effective within 30 days of the process change.
- The Control Authority may impose stricter alternative limits, but may not impose alternative limits that are less stringent than the calculated limits.
- A calculated alternative limit cannot be used if it is below the analytical detection limit, the IU must either: 1) not combine some of the dilute streams before they reach the combined treatment facility, or 2) segregate all wastestreams entirely.

4.4.2 Monitoring Requirements for Industrial Users Using the CWF

Requirements for self-monitoring by an industrial user are necessary to ensure compliance with the alternative categorical limit. Because the Iron and Steel Manufacturing pretreatment standards do no include self-monitoring requirements, the Control Authority will establish appropriate self-monitoring requirements.

4.4.3 Application of the CWF

The combined formula for mass-based limits is in Table 4.1. Table 4.2 presents an example of how the CWF is used to calculate alternative limits for specific iron and steel manufacturing operations. Before

TABLE 4.1

COMBINED WASTESTREAM FORMULA

Mass Limit Formula

$$M_t = \left(\sum_{i=1}^{N} M_i \right) \times \left(\frac{F_t - F_d}{\sum_{i=1}^{N} F_i} \right)$$

M_t - alternative mass limit for the pollutant

M_i - Categorical Pretreatment Standard mass limit for the pollutant in regulated stream i (the Categorical Pretreatment production-based standard limit multiplied by the appropriate measure of production)

F_i - average daily flow (at least 30 day average) of regulated stream i

F_d - average daily flow (at least 30 day average) of dilute wastestream(s)

F_t - average daily flow (at least 30 day average) through the combined treatment facility (including regulated, unregulated, and dilute wastestreams)

N - total number of regulated streams

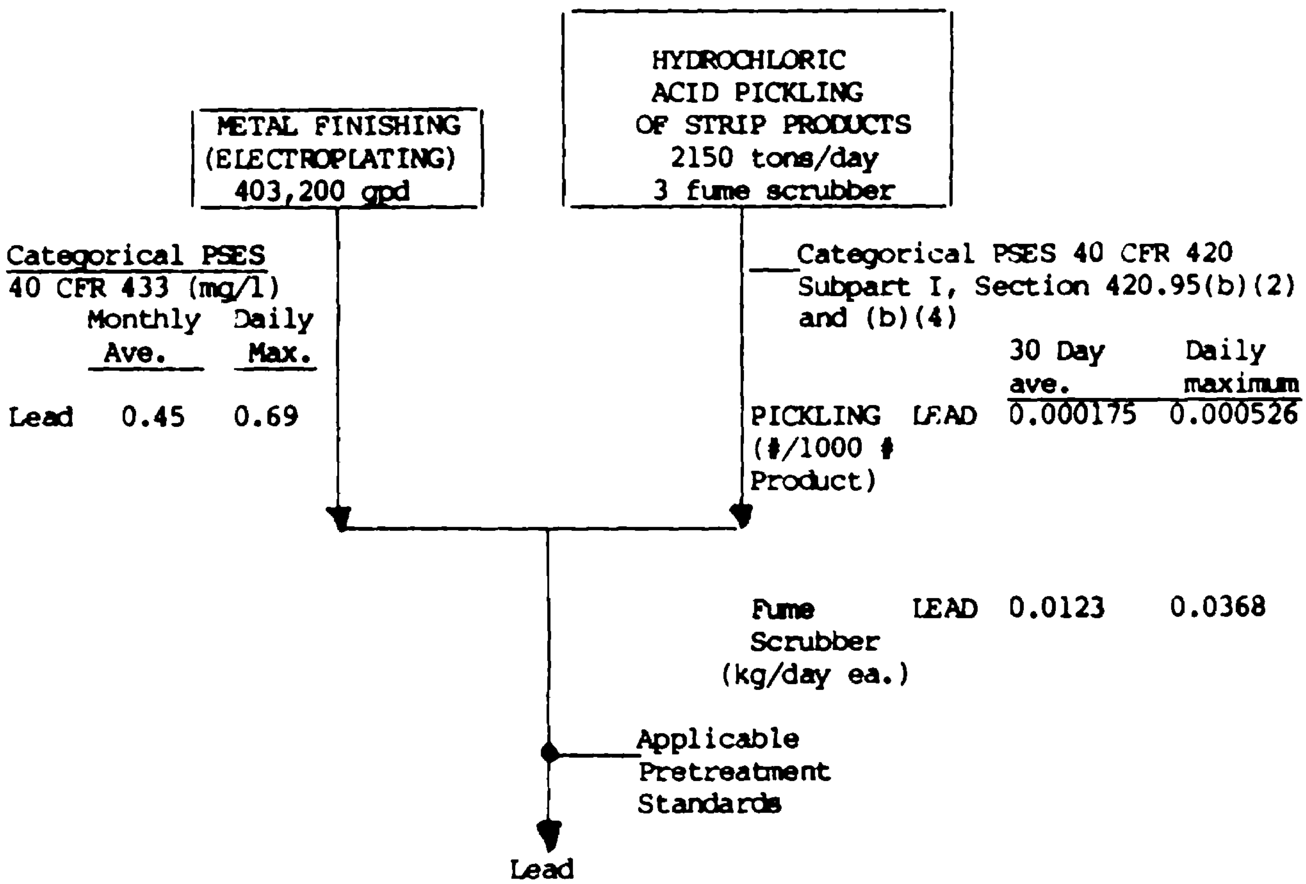
TABLE 4.2

COMBINED WASTESTREAM FORMULA EXAMPLE CALCULATION

EXAMPLE

This example demonstrates for one of the regulated pollutants (lead) how production-based pretreatment standards from an acid pickling operation (limited under 40 CFR Part 420 (Iron and Steel Point Source Category), compliance date of July 10, 1985) are combined with concentration-based pretreatment standards from a metal finishing (electroplating) operation (limited under 40 CFR Part 433 compliance date of February 15, 1986) to arrive at combined mass-based limit. The calculations below are made with the assumption that both compliance dates have passed. (Note: For calculations prior to the metal finishing compliance date, the electroplating wastestream would be considered unregulated and the flow value (F_i) from the iron and steel operations would be necessary to use the CWF.)

Acid Pickling Production:		
Hydrochloric Acid Pickling-Strip Products	--------	2150 tons/day
Number of fume Scrubbers	--------	3 units
Electroplating Wastewater flow (plating bath and final rinses only)	--------	403,200 gpd



Example Calculations

For the Lead Calculation:

Iron and Steel Lead Daily Maximum Limit = Limits for (Pickling) +3(Fume Scubber)

= Categorical Standard for Pickling x Production Rate for Pickling +3 x (Categorical Standard for each fume scrubber)

= [(0.000526 #/1000 # product) x (2150 tons/day x 2000 #/ton x 1 #/1000 # product)] + 3 (0.0368 kg/day ea. x 2.2 lbs/kg)

Lead (Iron and Steel) = 2.2618 + 0.2429 = 2.50 #/day Daily Max.

Metals Finishing Lead Daily Maximum Limit = Categorical Standard x flow

= 0.69 mg/l x (403,200 gpd x 8.34/10^6 Conversion Factor)

Lead (Metal Finishing) = 2.32 #/day Daily Max.

Since there is no dilution flow the applicable pretreatment lead daily maximum limit for the facility is:

Lead Daily Maximum = 2.50 #/day + 2.32 #/day
= 4.82 #/day

The 30-day limitation, calculated in a similar manner, is 2.28 #/day.

using the CWF, remember that when two or more regulated wastestreams are mixed prior to treatment, it is necessary to determine which pretreatment regulation applies to each regulated wastestream before they are mixed. For additional information on categorical pretreatment standards and the combined wastestream formula, refer to the manual entitled "Guidance Manual for the Use of Production-based Pretreatment Standards and the Combined Wastestream Formula" (September 1985). For calculation of the total toxic organics (TTO) limit, refer to the manual entitled, "Guidance Manual for Implementing Total Toxic Organics (TTO) Pretreatment Standards (September 1985).

4.5 REMOVAL CREDITS

A removal credit allows a POTW to provide its categorical industrial users with a credit (in the form of adjusted categorical pretreatment standards) for removal of pollutants by the POTW. Industrial users receiving such a credit are allowed to discharge to the POTW greater quantities of regulated pollutants than otherwise permitted by applicable categorical standards. Whether or not to seek authority to grant removal credits is at the discretion of the POTW. Section 403.7 of the General Pretreatment Regulations establishes the conditions under which a POTW can obtain approval to grant removal credits and specifies the means by which these removal credits are to be determined.

In 1977, Congress amended section 307(b) of the Clean Water Act to provide for removal credits. EPA originally implemented that provision and established the conditions under which POTWs could obtain authorization to grant removal credits in the June 26, 1978, General Pretreatment Regulations. On January 28, 1981, the removal credits provision was agained amended. On August 3, 1984 (49 Fed. Reg. 31212) the removal credits provision was again amended. Under the current provision, any POTW seeking removal credit authority is required to demonstrate its removal performance by sampling its influent and effluent and calculating its removal rates based on these data. Removal capability of each POTW, therefore, is to be determined on a case-by-case basis. In addition to the sampling requirements, the provision specified the other prerequisites for obtaining removal credit authority. Only the Approval Authority (either EPA or the State) can grant removal credit authority to a POTW. For more information on removal credits, refer to the manual entitled "Guidance Manual for Preparation and Review of Removal Credit Applications" (September 1985).

As part of the amendments to the iron and steel categorical standards (40 CFR 420.06) EPA acknowledged that biological treatment systems employed at POTW's will, in large measure, remove those pollutants for which phenols (4AAP) is used as an indicator pollutant to the same degree as they remove phenols (4AAP). Thus, removal allowances pursuant to 40 CFR 403.7(a)(1) may be granted for phenols (4AAP) limited in the iron and steel industry whether or not it is used as an indicator or surrogate pollutant.

4.6 FUNDAMENTALLY DIFFERENT FACTORS VARIANCE

A request for a fundamentally different factors (FDF) variance is a mechanism by which a categorical pretreatment standard may be adjusted on a case-by-case basis. If an indirect discharger, a POTW, or any interested person believes that the factors relating to a specific indirect discharger are fundamentally different from those factors considered during development of the relevant categorical pretreatment standard and that the existence of those factors justifies a different discharge limit from that specified in the Categorical Standard, then they may submit a request to EPA for such a variance (See 40 CFR 403.13).

4.7 LOCAL LIMITS

Local limits are numerical pollutant concentration or mass-based values that are developed by a POTW for controlling the discharge of conventional, non-conventional, or toxic pollutants from indirect sources. They differ from national categorical pretreatment standards in that categorical pretreatment standards are developed by EPA and are based on the demonstrated performance of available pollutant control technologies for specific categorical industries. These technology-based categorical standards do not consider local environmental criteria or conditions, but are developed to assure that each industry within a specified category meets a minimum discharge standard that is consistent for all POTWs across the United States. Local limits, on the other hand, are developed to address specific localized impacts on POTWs and their receiving waters. Local limits are typically designed to protect the POTW from:

- Introduction of pollutants into the POTW that could interfere with the operation

- Pass-through of inadequately treated pollutants that could violate a POTW's NPDES permit or applicable water quality standards

- Contamination of a POTW's sludge, which would limit sludge uses or disposal practices.

Local limits, as the name implies, take into consideration the factors that are unique to a POTW, whereas categorical pretreatment standards are developed only for a general class of industrial dischargers. Local limits are required under 40 CFR 403.5. For more information on the minimum local limit requirements for POTWs with approved pretreatment programs and the relationship between local limits and categorical standards, refer to the memorandum signed by Rebecca Hanmer on August 5, 1985 entitled "Local Limit Requirements for POTW Pretreatment Programs".

To assist municipalities in developing defensible and technically sound numerical effluent limits, EPA has prepared general guidelines on limit development in its document "Guidance Manual for POTW Pretreatment Program Development." Appendix L of the manual lists the general methodology, required formulas, and typical environmental criteria used to develop local limits. The manual is available from EPA Regional offices and delegated States and should be carefully followed when developing local limits. A more detailed guidance manual for local limit development is currently under development. The general methodology includes the following four steps:

Step 1 - Determine the maximum headworks loading (for each specific pollutant) that will assure that the objectives of the pretreatment program are met.

Step 2 - Calculate the allowable loading to the POTW by subtracting the uncontrollable portion of pollutant discharge to the POTW (from domestic, commercial, and infiltration/inflow sources) from the total headworks loading value.

Step 3 - Distribute the controllable loading to industrial users through an allocation process.

Step 4 - Derive specific local limits from the allocation results.

This four-step process must be followed for each pollutant that the POTW determines may need a specific local limit. As a general rule, the limit setting analysis should be performed for all pollutants that are discharged to the POTW in significant quantities. The POTW can identify pollutants of concern through its industrial waste survey. A procedure for evaluating industrial waste survey results is included in the EPA guidance manual mentioned above.

To assist POTWs with the development of local limits, EPA has also developed a computer program that incorporates the general methodology required to develop local limits and performs a substantial number of the calculations required to develop these limits. This computer program has the following capabilities.

- Performs the four-step limit setting analysis on microcomputer or mainframe
- Screens input data provided by the POTW
- Supplements POTW data with built-in files containing data on industrial and municipal wastewater characteristics, POTW removal rates and POTW inhibition values
- Allocates controllable pollutant loads using several different methodologies
- Compares calculated local limits to EPA categorical standards.

POTWs may obtain information on this computer program by contacting the EPA Regional office. Instructions are available on how to obtain and use the computer program as well as how to gain access to a computer system that supports it.

REFERENCES

IRON AND STEEL	FEDERAL REGISTER NOTICE		
Final Regulations Promulgated	05/27/82	47FR	23258
Amended (Effective Date)	06/07/82	47FR	24554
Amended (Coding and minor errors)	09/22/82	47FR	41738
Amended (Final and interim regulation)	10/14/83	48FR	46942
Correction Notice	11/10/83	48FR	51647
Correction Notice	11/14/83	48FR	51773
Amended (Final)	04/17/84	49FR	21024

GENERAL PRETREATMENT REGULATIONS			
40 CFR 403	01/28/81	46FR	9404
40 CFR 403	04/17/84	49FR	21037 (Ammended)
40 CFR 403	08/03/84	49FR	31212

REPORTS AND MANUALS	NTIS or GPO Number
Final Development Document - Iron and Steel Vol. I-VI May 1982 440/1-82/024	PB82-240425 PB82-240433 PB82-240458 PB82-240466 PB82-240474
Guidance Manual for POTW Pretreatment Program Development	October 1983
Procedures Manual for Reviewing a POTW Pretreatment Program Submission	October 1983
Guidance Manual for Electroplating and Metal Finishing Pretreatment Standards	February 1984
Guidance Manual for Preparation of Removal Credits Applications	September 1985
Guidance Manual for Implementing Total Toxic Organics (TTO) Pretreatment Standards	September 1985
Guidance Manual for the Use of Production-based Pretreatment Standards and the Combined Wastestream Formula	September 1985

Miscellaneous

RCRA Information for Publicly Owned Treatment Works September 1985

Local Limits Requirements for POTW Pretreatment Programs, memorandum signed by Rebecca Hanmer on August 5, 1985.

Copies of the technical and economic documents may be obtained from the National Technical Information Services, Springfield, VA. 22161 (703/487-4650). Pretreatment Program Manuals may be obtained from U.S. EPA, Permits Division (EN-336), Washington, DC 20460.

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