RADIAN CORPORATION

AN AIR POLLUTION COMPLIANCE ANALYSIS REPORT ON NINE INDUSTRIES

VOLUME II
FERROALLOYS

FINAL REPORT

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FERROALLOYS

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Presented to:

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Division of Stationary Source Enforcement
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25 September 1975

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FOREWORD

This study of the ferroalloy industry is one of nine concurrently accomplished tasks to locate individual plants and production rates, analyze processes and air emissions, and present compliance status data for nine large industries. The remaining eight, presented in individual volumes, are primary aluminum, portland cement, sulfuric acid, nitric acid, phosphate fertilizer, coal cleaning, gray iron, and asphalt concrete. In this study, Radian considered only the process emission points for which EPA has published emission factors. One study estimated totals for the emission points of these nine industries to be 1,975,000 tons of particulates and 600,000 tons of sulfur dioxide in 1967 (LE-125). Another study estimated 1968 particulate emissions from these nine to be 1,850,000 tons (VA-091).

Program Manager for the entire nine industry task was Mr. C. P. Bartosh. Mr. B. P. Cerepaka was Task Director.

ABSTRACT

The following study involved the ferroalloy industry in the United States. The goals of the study were to locate plants, obtain all available process, production, and emissions data, compute allowable particulate emissions from the SIPs, and determine the compliance status from the compliance Data System (CDS) and, if needed, regional office files.

In 1973 United States ferroalloy production was 2,520,000 tons of which the primary types were ferromanganese, silicomanganese, ferrosilicon, silvery pig iron, chromium alloys, and ferrophosphorus. The industry was reported to be operating at capacity. The number of producing plants was forty-seven according to the Minerals Yearbook 1973.

Total nationwide potential, actual, and allowable particulate emissions could not be obtained from individual plant data. Complete data on individual plant capacities and production were also not available. Radian performed calculations to estimate potential particulate emissions for those ferroalloy products which have operations covered by EPA emission factors. Based on 1972 production of 1,794,000 tons of ferrosilicon (including silicon metal), ferromanganese, and silicomanganese, potential emissions were calculated to be 138,000 tons. EPA has not published emission factors for the production of the remaining ferroalloys (EN-071). Another study estimated actual particulate emissions from ferroalloy furnaces in 1968 to be about 151,000 tons with an average control level of about 40% (VA-091).

For the fifty-seven ferroalloy plants located in this study, five (9%) were reported to be in compliance, nine (16%)

out of compliance, and forty-three (75%) unknown. These catagories are subdivided as follows: three plants (5%) were in compliance with emission limitations as determined by source test, inspection, or state certification, two plants (4%) were in compliance with the increments of progress of a schedule, three plants (5%) were out of compliance with emission limitations, six plants (11%) were out of compliance with the increments of progress of a compliance schedule, twenty-four plants (42%) had unknown status with respect to emission limitations, and nineteen plants (33%) had unknown compliance with increments of progress of a schedule. Table 6.2-1a showing the compliance status breakdown by region follows this page for easy reference.

TABLE 6.2-1a

FERROALLOY PLANTS

CATEGORICAL SUMMARY OF COMPLIANCE STATUS BY REGION

MAY, 1975

	IN		OUT		UNKNOWN		
REGION	IN COMPLIANCE EMISSION LIMITATION	IN COMPLIANCE WITH SCHEDULE	OUT OF COMPLIANCE EMISSION LIMITATION	OUT OF COMPLIANCE WITH SCHEDULE	UNKNOWN COMPLIANCE EMISSION LIMITATION	UNKNOWN COMPLIANCE WITH SCHEDULE	TOTAL
I	0	0	0	0	0	0	0
II	0	0	0	0	4	1	5
III	0	0	1	3	3	6	13
IV	0	0	0	0	9	11	20
V	0	2	0	0	6	1	9
VI	0	0	1	1	0	0	2
VII	0	0	0	1	0	0	1
VIII	0	0	1	0	0	0	1
IX	0	0	0	0	0	0	0
X	3	0	0	1	2	0	6
TOTAL	3	2	3	6	24	19	57
	(5%)	(4%)	(5%)	(11%)	(42%)	(33%)	
TOTAL	5 (9%)		9 (16%)		43 (75%)		57

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

DATA TABLES OF INDIVIDUAL SOURCES

1.0 INTRODUCTION

The major goals of this study of the ferroalloy industry were to (1) locate all ferroalloy plants; (2) gather data on processes, production, and emissions; (3) calculate allowable emissions based on state implementation plans (SIPs); and (4) determine each source's compliance status as given in the Compliance Data System (CDS) or through contact with the regional offices. Plant size and location were the priority goals.

The format of this report is as follows:

- The remainder of this section presents a definition and characterization of the industry and future trends expected.
- Section 2 describes the process of ferroalloy production.
- Section 3 describes air pollutant emissions and control devices.
- Section 4 is a summary of the SIP regulations applicable to ferroalloy plants.
- Section 6 presents the data gathered for individual plants and also summaries.

1.1 Industry Definition and Characterization

In this report the definition of ferroalloys is that employed by the Bureau of Mines. Ferroalloys are alloys of iron in combination with some other element or elements. The major types by tonnage produced in the United States are ferromanganese, silicomanganese, ferrosilicon (including silicon metal), silvery pig iron, chromium alloys, and ferrophosphorus. The major uses of ferroalloys are as additive constituents in the production of steel, cast iron, and aluminum (US-144). Specifically, ferromanganese and silicomanganese are used in the iron and steel industry to counteract the effects of sulfur, thereby improving hot working properties during rolling. The alloys are also used to deoxidize and clean molten steel. Ferrochromium and other chromium alloys are important additives in steel because they reduce corrosion and oxidation. Ferrosilicon alloys are also primarily used in the iron and steel industry. Silvery pig iron (5-24% Si) is used in gray iron production, ferrosilicon (25-95% Si) is used in steel production for deoxidation of molten metal and removal of dissolved gases. Silicon metal (95-99% Si) is used by secondary aluminum producers to improve corrosion resistance and mechanical properties of aluminum castings.

Ferroalloys are made by a variety of processes such as electric submerged - arc smelting, alumino/silicothermic process, vacuum process and electrolytic production. Ferroalloys for the steel industry have also been produced in blast furnaces. For purposes of locating plants, all types of production processes were included in this study, but for estimations of emissions this study deals only with electric smelting furnaces since these are the only ferroalloy operations for which EPA has published emission factors. Over 75% of ferroalloy production is by the electric smelting process (EN-067).

The ferroalloy industry is classified by the Standard Industrial Classifications Manual 1972 by SIC code 3313, except for those establishments which produce ferroalloys in blast furnaces. SIC code 3312 is used for these establishments.

1.2 Production and Capacity

Ferroalloy production in the United States is highly competitive and directly related to demand levels for steel, cast iron, and aluminum (US-064, US-144).

Total ferroalloy production in the United States has not exhibited many major trends in the recent years. Production reported by the Bureau of Mines has varied from 2,628,000 tons in 1969 to 2,520,000 tons in 1973. See Table 1.2-1. Production of individual ferroalloy groups varies according to market conditions, raw material availability, and foreign competition. Ferromanganese (27% of 1973 ferroalloy production) and silicomanganese (7%) production have been dropping recently due to foreign competition. Domestic lack of the raw material, manganese ore, is also a major factor. Chromium alloy production (17%) also declined due to dependence on foreign ore. Ferrosilicon production (35%) has been increasing recently in response to market demand. An ample domestic ore supply of quartz allows U.S. ferrosilicon producers to compete successfully with foreign firms. Silvery pig iron production (5%) has been slowly declining as a result of decreasing demand by its primary consumer, the gray iron industry.

EPA reported the existence of 44 ferroalloy plants (including 4 which produce only calcium carbide) operating 145 ferroalloy furnaces in 1971. Electric furnaces are rated by power supplied to the electrodes. In the ferroalloy industry furnaces range in size from 7 to 50 megawatts with about 10 Mw being characteristic of older furnaces and 30 Mw for newer furnaces.

TABLE 1.2-1

FERROALLOY PRODUCTION STATISTICS (TONS)

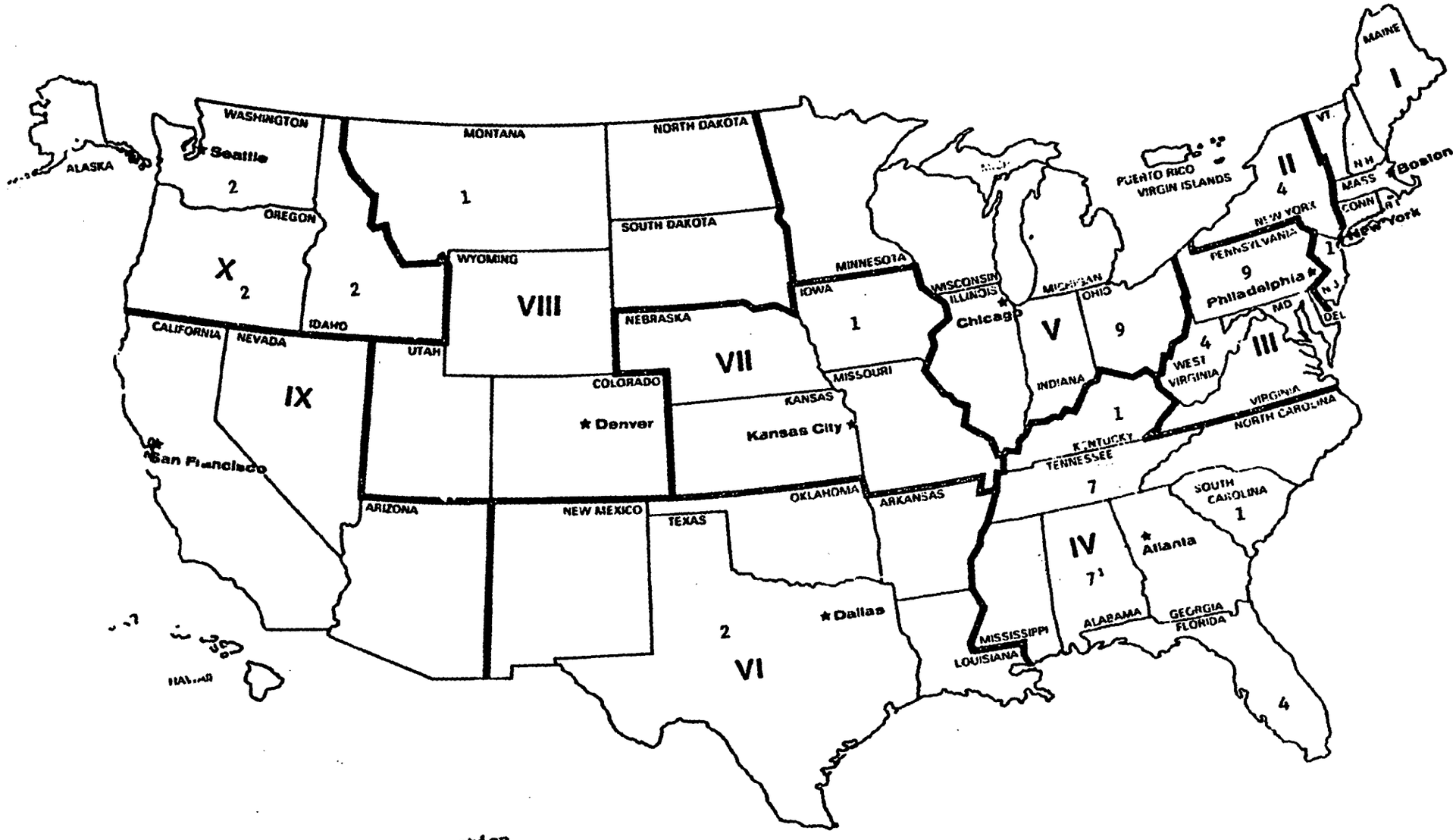
Product	1969	1970	1971	1972	1973
Ferromanganese	852,019	835,463	759,896	800,723	683,075
Silicomanganese	222,877	193,219	164,682	153,234	183,702
Ferrosilicon	715,172	709,287	687,166	841,386	877,798
Silvery Pig Iron	204,027	196,369	171,788	163,073	135,009
Chromium Alloys	419,038	405,776	355,658	352,305	426,846
Ferrotitanium	4,441	3,360	3,363	3,650	1,784
Ferrophosphorus	130,582	164,107	101,353	130,355	129,646
Ferrocolumbium	2,301	1,260	830	1,160	1,167
Other	78,046	86,347	86,329	80,738	80,928
Total	2,628,503	2,595,188	2,331,055	2,526,624	2,519,955

Source: (US-064, US-144)

Capacity depends on the type of product produced by the furnace. A 30 Mw furnace operating at 90% capacity would produce 99,000 tons of ferromanganese, 44,000 tons of silicomanganese, 47,500 tons of 50% ferrosilicon, 51,000 tons of ferrochromium, or about 17,000 tons of silicon metal (DE-151).

The Minerals Yearbook 1973 reported production of ferroalloys at forty seven locations, not including one new plant under construction in Alabama. The types of furnaces in use were also reported. Forty one plants produced ferroalloys in electric furnaces, five operated aluminothermic furnaces, and two produced in blast furnaces at steel mills. One producer used both aluminothermic and electric furnaces.

In this study Radian has located fifty seven plants which are reported to produce ferroalloys. In addition, one plant is reported under construction. Forty-eight were located in the Minerals Yearbook, 1973, nine others were found only in NEDS, CDS data bases, and one was found in the Texas Index of Manufacturers 1974.. Ohio, Pennsylvania, Tennessee, and Alabama are states with the most ferroalloy plants. See Figure 1.2-1.



[1] Including One Under Construction

FIGURE 1.2-1. FERROALLOY PRODUCERS

2.0 FERROALLOY PRODUCTION PROCESSES

This section describes the production of ferroalloys. Ferroalloys are usually produced by carbothermal smelting in electric submerged-arc furnaces. Depending on the product made, the raw materials used most often are quartz, manganese ore, chrome ore, scrap iron, and reducing agent. Sometimes wood chips are required for porosity within the furnace charge. The purpose of the reducing agent is to remove oxygen from the metallic oxide ore so that droplets of the metal fall to the hearth and form a metal pool. The reducing agent is usually in the form of lumpy or pea-size by-product coke and low-volatile coal (DE-151). Besides the submerged-arc furnace process, ferroalloys are made by the exothermic process, electrolytic process, vacuum furnace process, and induction furnace process. Table 2.0-1 gives a listing of the types of ferroalloy products made by each process. About 75% of ferroalloy tonnage is produced in submerged arc furnaces (EN-071). Details of the operations of each process are described below.

2.1 Submerged-Arc Furnace Process

The general design of submerged-arc furnaces is basically the same throughout the industry. The steel furnace shell is normally cylindrical with a flat bottom and is supported on an open foundation that permits air cooling and heat dissipation. The bottom interior of the steel shell is lined with two or more layers of carbon blocks sealed with mortar. The furnace shell's interior walls are lined with refractory or carbon brick. One or more tapholes for removing slag and metal are provided through the furnace shell at the hearth level. In some cases, the furnace is designed to rotate (DE-151).

TABLE 2.0-1

FERROALLOY PRODUCTION PROCESSES AND PRODUCTS

Submerged-arc furnace process - (Electric furnace)	Silvery iron (15-22% FeSi)
	50% Ferrosilicon
	65-75% Ferrosilicon
	Silicon metal
	Calcium silicon
	Silicon-manganese-zirconium (SMZ)
	High-carbon (HC) ferromanganese
	Siliconmanganese
	Ferromanganese silicon
	Charge chrome and HC ferrochrome
	Ferrochrome-silicon
	Ferrophophorus
Exothermic process - (Aluminothermic)	Low-carbon (LC) ferrochrome
	LC ferromanganese
	Medium-carbon (MC) ferromanganese
	Chromium metal, FeTi, FeV and FeCb
Electrolytic process -	Chromium metal
	Manganese metal
Vacuum furnace process -	LC ferrochrome
Induction furnace process -	Ferrotitanium
Blast furnace process -	Ferromanganese

SOURCE: (DE-151, US-144)

The furnace process is continuous. Power is continuously applied to the electrodes, and feed materials that consist mostly of reducing material (coal or coke) and ores may be charged to the furnace on either a continuous or an intermittent basis. Normally three electrodes are used and are suspended over the furnace hearth in a delta formation. They protrude into the furnace charge to a depth of 3 to 5 feet and their vertical movement is controlled by mechanical or hydraulic means. This electrode depth is continually varied as required to maintain a near-uniform electrical load. The trend is to use self-baking electrodes for new large furnaces. The major smelting occurs in the "reaction zones" surrounding the electrodes. This smelting utilizes carbon reduction of metallic oxides (DE-151).

Submerged-arc furnaces have been generally built with open tops and the reaction gases burn on the surface of the charge. The combusted gases are vented to the atmosphere through roof monitors, or collected by a hood over the furnace crucible and directed by duct work to dust removal equipment or vented by stacks to the atomsphere. The furnace parts over the crucible, such as the electrode holders, the hangers, the current conductors, the contact plates, and the charging chutes, are exposed to the radiant heat of the furnace and hot furnace gases. These components must receive effective heat protection through the use of cooling water flowing through interior passages in the metal parts. Figure 2.1-1 shows a cross section of a typical open furnace and some accessory equipment. Some ferroalloys, such as high silicons, require regular stoking and directed mix placement, which can only be performed in an open furnace.

Submerged-arc furnaces producing certain ferroalloys have water-cooled covers. The collected uncombusted gases are cleaned by venturi or centrifugal scrubbers, and the gases may be flared or used as fuel. In such furnaces, the raw materials

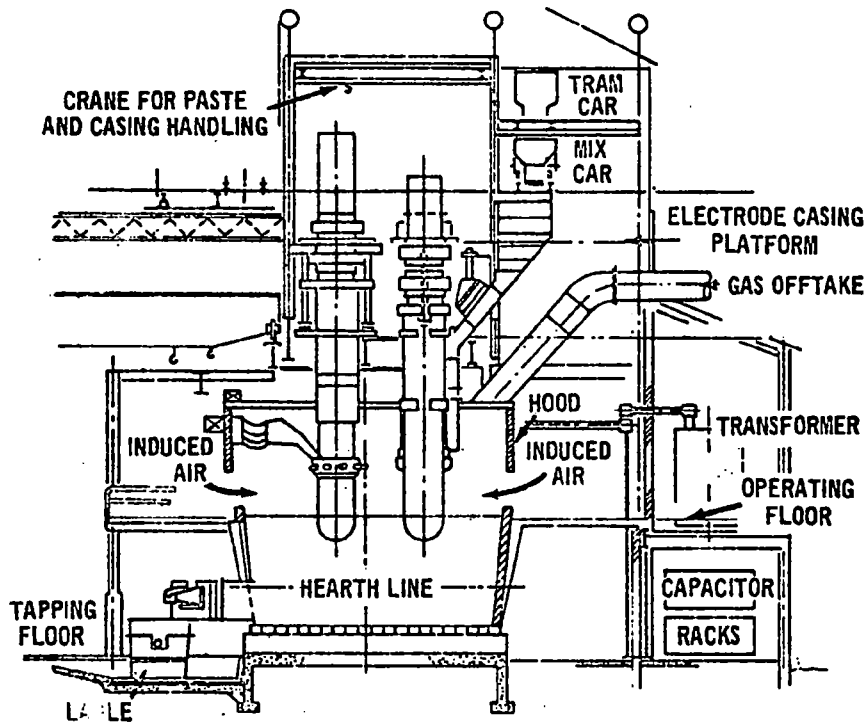


FIGURE 2.1-1 CROSS SECTION OF OPEN FURNACE

required to produce the low-energy products do not tend to bridge excessively, and regular stoking of the charge is not necessary (DE-151).

2.2 Exothermic Process

Several metals and low-carbon ferroalloys are produced by the exothermic process, also called the aluminothermic or silicothermic process. However, it is used to a lesser extent than the submerged-arc furnace process. Most of the charge material used in the exothermic process may be first produced by the submerged-arc or open-arc furnaces. Silicon or aluminum, or a combination of the two, is the reducing agent. This agent reacts with the charge to remove oxygen, thus generating considerable heat; temperatures may reach several thousand degrees. Since the process is exothermic, the reduction can take place outside a furnace--usually in ladles (DE-151).

2.3 Electrolytic Process

The pure metals of manganese and chromium are now generally produced electrolytically. In this process, simple ions of the metal contained in an electrolyte of modest concentration are plated on cathodes by a low-voltage direct current. The pure metal, collected as a film about 1/8 inch thick on the cathode, is removed and prepared for shipment. Metal deposition usually occurs in a number of cells with multiple plates connected in a series of parallel electrical circuits; all are contained in a ventilated building.

Because electrolyte preparation is complex, feed materials require some chemical preprocessing. For example, manganese ores are calcined and leached (usually to form manganese sulfate),

mixed with ammonium salts, and delivered in solution to the bath. The sources of the feed materials are ores, high-metal-oxide slags, and ferroalloys produced in submerged-arc furnaces (DE-151).

2.4 Vacuum Furnace Process

The vacuum furnace process for producing LC ferrochrome was developed commercially in the early 1950's. In this process, carbon is removed from HC ferrochrome in a solid state within vacuum furnaces (see Figure 2.4-1) carefully controlled at a temperature near the melting point of the alloy. The process is based on the oxidation of HC ferrochrome by the oxygen in silica or chrome oxide. Carbon monoxide gas resulting from the reaction is pumped out of the furance to maintain a high vacuum and to facilitate decarburization of the ferrochrome. Heat is supplied to the furances by electric resistance elements. The vacuum furnace process causes no particulate emissions. The small quantities of carbon monoxide gas that evolve from the reaction are withdrawn by a steam jet ejector (DE-151).

2.5 Induction Furnace Process

Induction furnaces, either low-frequency or high-frequency, are used to produce small tonnages of a few specialty alloys through remelting of the required constituents. See Figure 2.5-1 (DE-151).

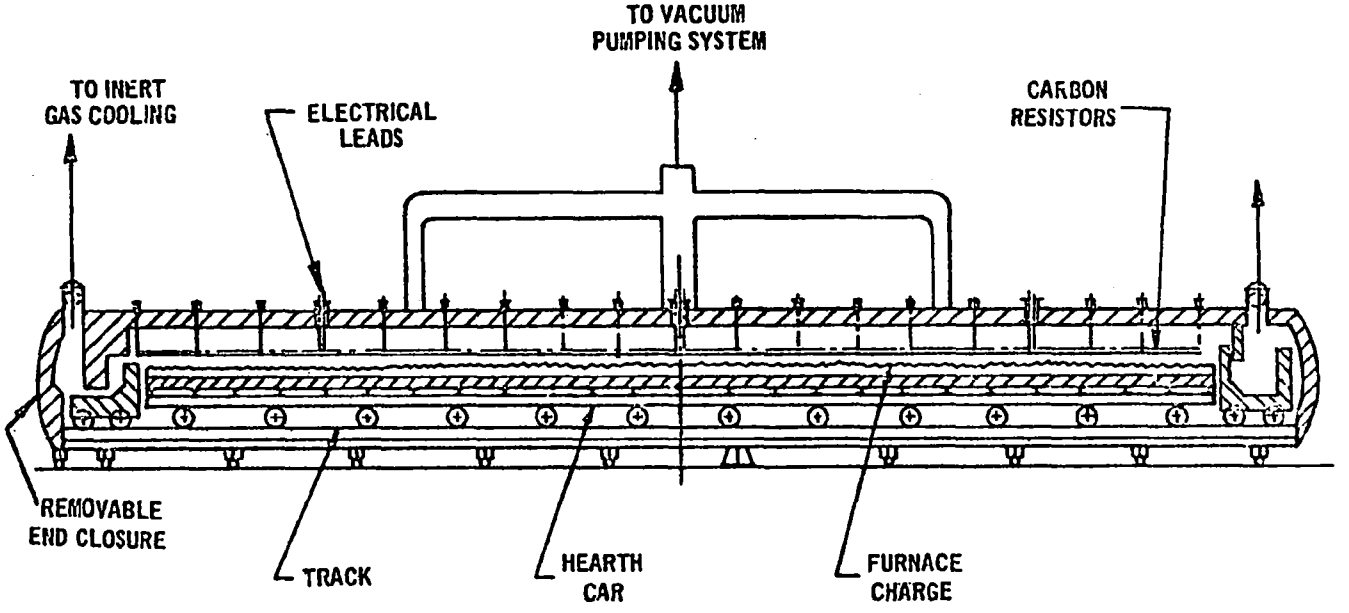


FIGURE 2.4-1 SIMPLEX VACUUM FURNACE FOR FERROALLOY PRODUCTION

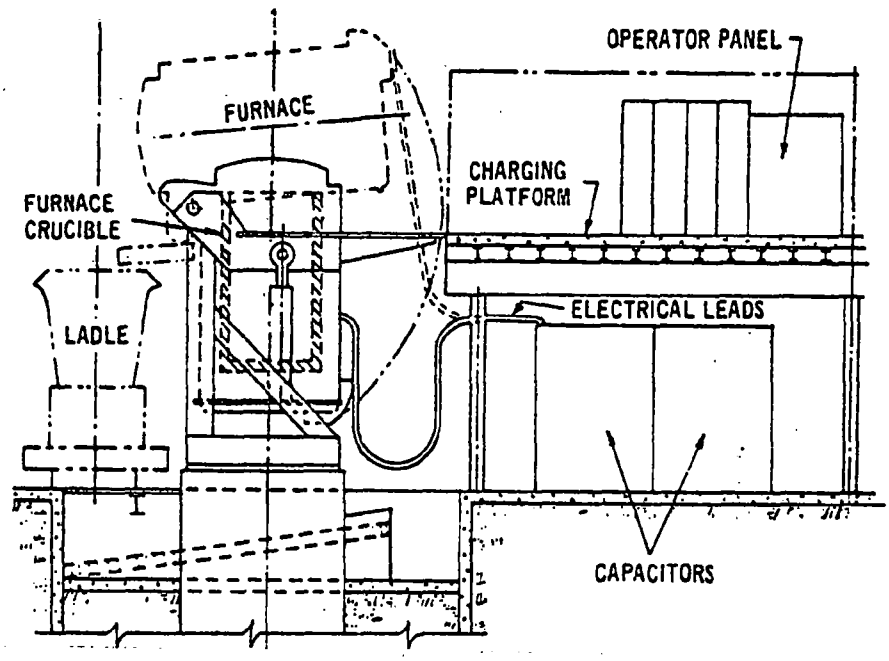


FIGURE 2.5-1 INDUCTION MELTING FURNACE

3.0 EMISSIONS AND CONTROLS

This section presents a description of air pollutant emissions and control at ferroalloy plants. Electric submerged arc furnaces are the only operations with EPA emission factors (EN-071). Quantitative analysis of emissions are restricted to ferroalloy production from this type of operation.

3.1 Emissions Sources

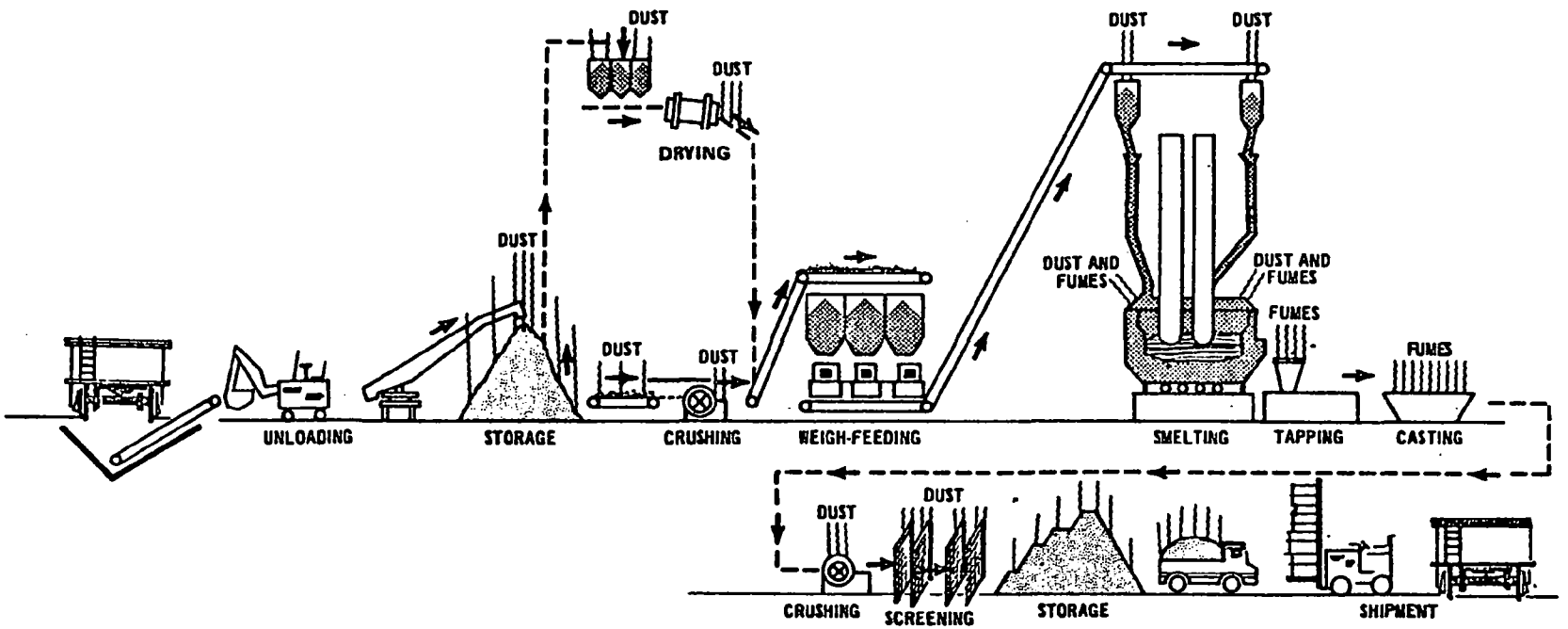
Sources of particulate emissions at ferroalloy plants are raw material storage, handling, and preparation, electric smelting, tapping, casting, and product storage, handling and sizing. These emission points are displayed graphically in Figure 3.1-1. The electric furnace is also a major source of carbon monoxide emissions. Oxides of sulfur and nitrogen are not significant emissions from ferroalloy production (DE-151).

3.2 Potential Particulate Emissions

EPA has published emission factors only for electric-arc furnaces operations. They vary according to the type of ferroalloy produced and the power input to the furnace per ton of ferroalloy produced. Potential emission factors are 200 lbs/ton of 50% ferrosilicon produced, 315 lbs/ton of 75% ferrosilicon produced, 565 lbs/ton of 90% ferrosilicon produced, 625 lbs/ton silicon metal produced, 195 lbs/ton silicomanganese produced and 45 lbs/ton ferromanganese produced (EN-071).

Emissions from exothermic ferroalloy production are reported to range from 20 to 40 lbs/ton of ferroalloy produced. Total emissions from this type of process are relatively small since only 10 to 15 percent of all ferroalloy production is by

FIGURE 3.1-1 - FERROALLOY PRODUCTION FLOW DIAGRAM
SOURCE: (DE-151)



the exothermic process (DE-151). Emissions from electrolytic process and vacuum and induction furnace processes are also relatively small (DE-151).

3.3 Emission Controls

Electric-arc furnace particulate control systems and levels of control vary with the type of hood which covers the furnace. There are three types: the open furnace, the semi-enclosed furnace, and the enclosed or sealed furnace. Both the semi-enclosed and enclosed furnaces are sometimes referred to as covered furnaces. Control systems also service emissions captured by hoods over the tapping operations at electric furnaces.

In the open furnace carbon monoxide and other combustibles in the furnace offgas burn with induced air at the charge surface. In the covered furnaces, most or all of the combustibles and induced air are withdrawn without combustion from the charge surface, vented to control devices, and then flared (DE-151).

3.3.1 Open Furnace Control

The open furnace requires high volumes of air flow to capture emissions. The most popular control device used to clean air captured by the hood is a venturi scrubber. Because of the large volumes of air, particulate grain loadings are low and pressure losses are high. The energy required to operate a scrubber is equivalent to about 10 percent of power needed to operate the furnace (DE-151). Figure 3.3-1 shows a typical open furnace installation with scrubber. Overall control efficiencies achievable are reported to range up to 96-99 percent. Fugitive emissions are relatively low for normal furnace operations, if well hooded. Baghouses and electrostatic precipitation are also used to control open furnace emissions (DE-151).

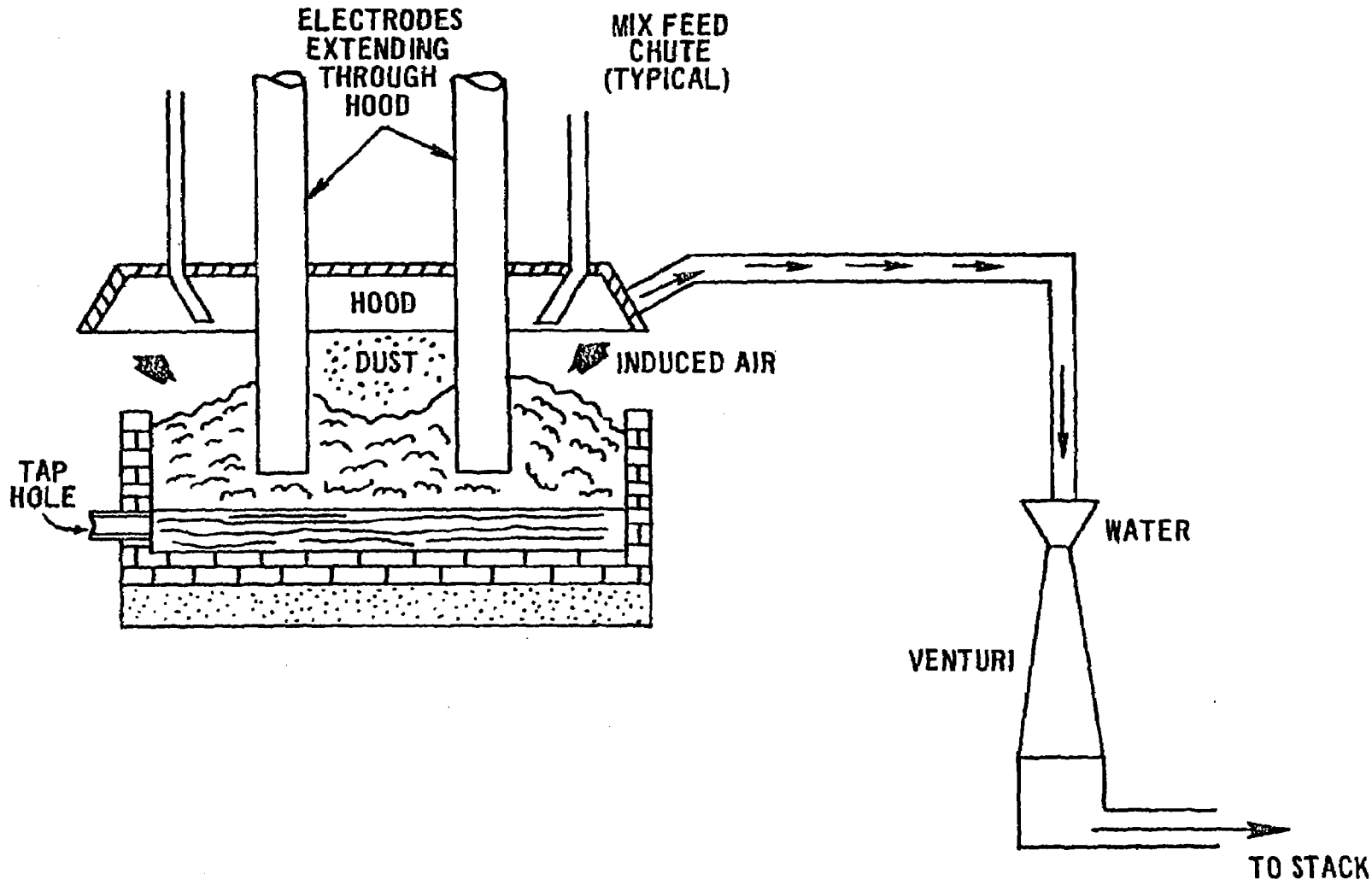


FIGURE 3.3-1 *OPEN FURNACE CONTROLLED BY A VENTURI SCRUBBER*

3.3.2 Covered Furnace Controls

Only venturi scrubbers are reported to be used on covered furnaces in the U.S., primarily because of high gas temperatures and the safety hazard associated with the handling of carbon monoxide. A covered ferroalloy furnace has a water-cooled cover that seals the top of the furnace, including the electrodes, mix spouts, and access openings. This seal prevents the induction of ambient air that would otherwise burn the gases coming from the reduction process. The dust-laden furnace gas is withdrawn from under the cover, cleaned, and either used as fuel or flared above the furnace building. The quantity of gas that needs cleaning from a covered furnace can be only 3 to 5 percent of that from an open furnace.

Two types of covered ferroalloy furnaces are currently in operation. Developed in the 1930's, the initial version of the covered ferroalloy furnace has mix seals at the electrodes and is generally called a semi-covered or semi-enclosed furnace (see Figure 3.3-2). A later version is essentially the same as the earlier one except that tight or fixed seals are used in place of mix seals at the electrodes. This configuration is called a totally enclosed or sealed furnace (see Figure 3.3-3). However, mix seals are maintained within the chutes at the cover of the totally enclosed furnace by choke-feeding the material.

With a semi-enclosed furnace, the mix is charged to the furnace through the annulus around each electrode, and an air gap is established between the furnace cover and the mix chute to prevent an electrical current flow. If enough mix is added to keep this space filled, it acts as a seal that prevents or limits the gases under the cover from escaping through the mix around the electrodes. Efficiencies range from 75-98 percent for

semi-enclosed furnaces. Fugitive emissions escaping from the mix seals are the major reason for the low overall control efficiencies. These fugitive losses have been reported to be 2 to 12 percent of the total potential particulate emissions from the furnace.

In the totally enclosed furnace, seals are fixed insulators around the electrodes and cover which allows the air pollution control system to collect essentially all of the dust and fumes. Efficiencies of control are reported to exceed 99 percent. No U.S. ferroalloy plants are known to use sealed furnaces (DE-151).

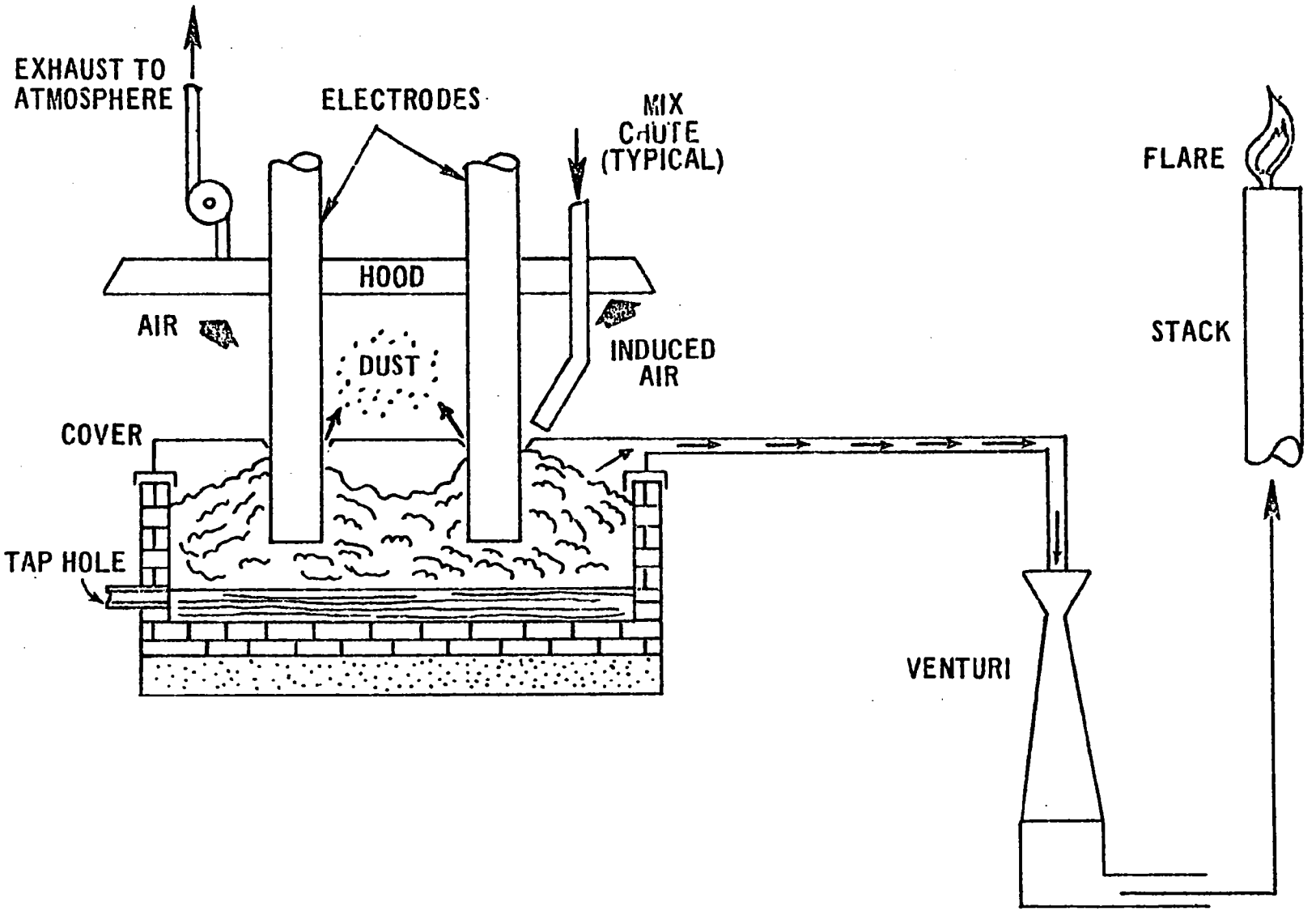


FIGURE 3.3-2 SEMI-ENCLOSED FURNACE CONTROLLED BY A VENTURI SCRUBBER

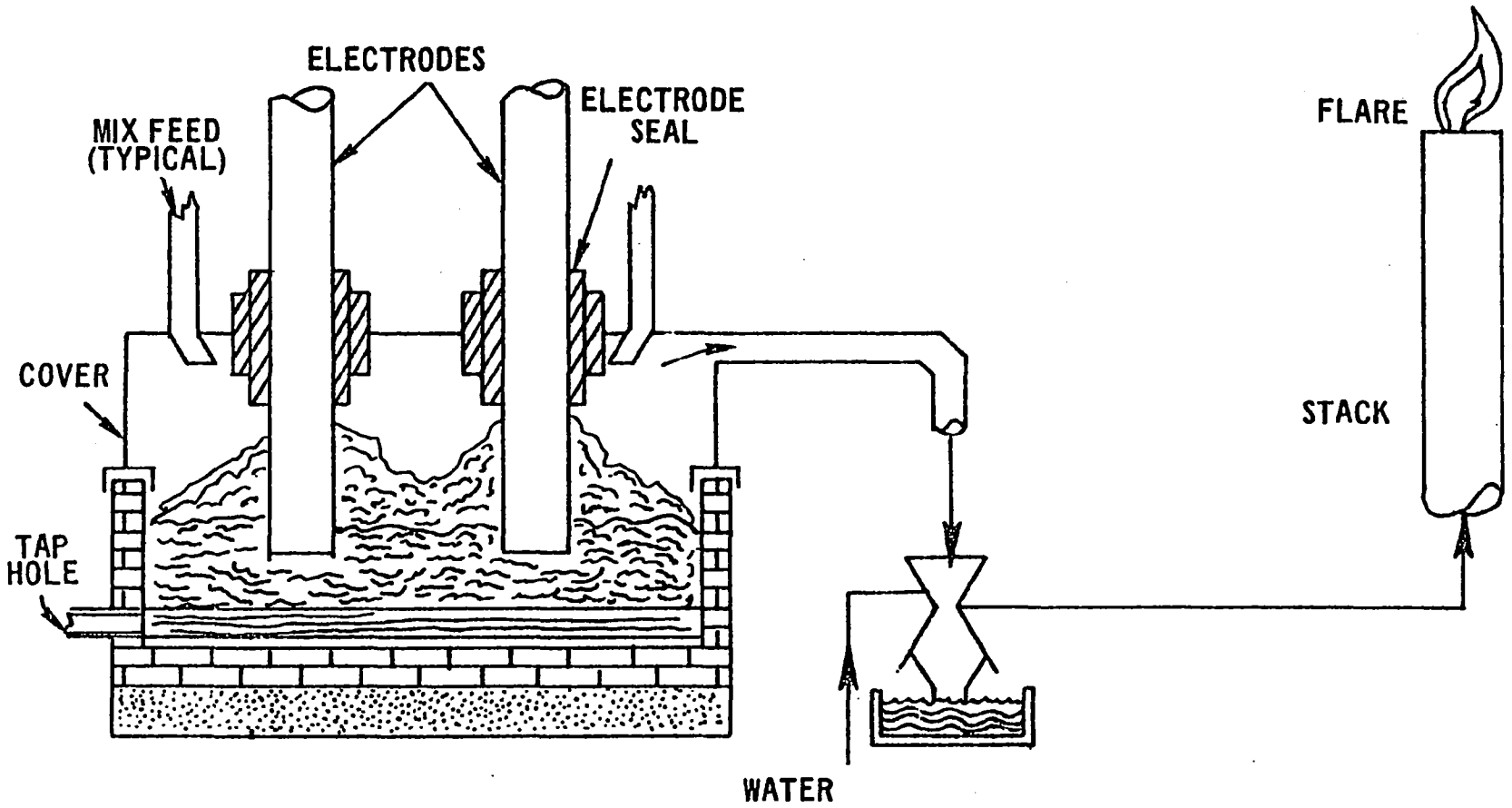


FIGURE 3.3-3 SEALED FURNACE CONTROLLED BY VENTURI SCRUBBER

4.0 STATE IMPLEMENTATION PLAN REGULATIONS

SIP regulations were obtained from DSSE files in December, 1974. A summary of applicable particulate emission regulations is presented in Table 4.0-1 for those states which have ferroalloy producers. Compliance analysis in this report was restricted to furnace operations. Other fugitive emission points may be affected by the SIPs. Any compliance schedules for such emission points will appear with the data collected for each plant in the tables in Section 6.3. Because of incomplete process and production data for individual plants, no calculations of allowables were made. The range of efficiencies required by the SIPs depends on the ferroalloy product and furnace size. The well-controlled open furnaces described in Section 3.3 would have efficiencies of about 96-99 percent.

TABLE 4.0-1
SIP AIR EMISSION REGULATIONS
EXISTING FERROALLOY PLANTS

GOVERNMENT ENTITY	REGULATION NUMBER	MAXIMUM ALLOWABLE PARTICULATE EMISSIONS	
Alabama	4.4.1	Class 1 Counties:	
		$E = 3.59P^{0.62}$	$P \leq 30$ tons/hr
		$E = 17.31P^{0.16}$	$P \geq 30$ tons/hr
		E = Emissions, lbs/hr P = Process weight, tons/hr	
	4.4.2	Class 2 Counties:	
		$E = 4.10P^{0.67}$	$P \leq 30$ tons/hr
		$E = 55.0P^{0.11}-40$	P>30 tons/hr
Florida	17-2.04(2)	$E = 3.59P^{0.62}$	$P \leq 30$ tons/hr
		$E = 17.31P^{0.16}$	P>30 tons/hr
Idaho	H-Sec 2	$E = 4.10P^{0.67}$	$P \leq 30$ tons/hr
		$E = 55.0P^{0.11}-40$	P>30 tons/hr
Iowa	4.3a	$E = 4.10P^{0.67}$	$P \leq 30$ tons/hr
		$E = 55.0P^{0.11}-40$	P>30 tons/hr
Kentucky	AP-3(3)(2)	$E = 4.10P^{0.67}$	$P \leq 30$ tons/hr
		$E = 55.0P^{0.11}-40$	P>30 tons/hr
Montana	16-2.14(1)	$E = 4.10P^{0.67}$	$P \leq 30$ tons/hr
		$E = 55.0P^{0.11}-40$	P>30 tons/hr
New Jersey	7:27-6.2	0.02 gr/scf	
New York	2.3.3	Found from Process Weight Rate Table	

TABLE 4.0-1 (Cont.d)

GOVERNMENT ENTITY	REGULATION NUMBER	MAXIMUM ALLOWABLE PARTICULATE EMISSIONS	
Ohio	EP11-11	$E = 4.10P^{0.67}$	$P \leq 30$ tons/hr
		$E = 55.0P^{0.11}-40$	$P > 30$ tons/hr
Oregon	21-040	$E = 4.504P^{0.67}$	$P \leq 0.65$ tons/hr
		$E = 4.14P^{0.552}$	$0.65 < P \leq 5$ tons/hr
		$E = 2.739P^{0.773}$	$5 < P \leq 30$ tons/hr
		$E = 55.0P^{0.11}-40$	$P > 30$ tons/hr
Pennsylvania	123.13	(1) 0.02 gr/scf, or	
		(2) $E = 0.76(0.3W)^{0.76}$, whichever is greater	
		W = Production rate, tons/hr	
South Carolina	Standard No. 5 Section VII, B	$E = 4.10P^{0.67}$	
		$E = 55.0P^{0.11}-40$	
Tennessee	Sec. 4	$E = 4.10P^{0.67}$	$P \leq 30$ tons/hr
		$E = 55.0P^{0.11}-40$	$P > 30$ tons/hr
Texas	105.1	$E = 0.048Q^{0.62}$	
		Q = Stack effluent rate, acfm	
Washington	WAC-18-04-060	0.2 gr/scfd	
		by July 1, 1975	
		0.1 gr/scfd	

TABLE 4.0-1 (Cont'd)

GOVERNMENT ENTITY	REGULATION NUMBER	MAXIMUM ALLOWABLE PARTICULATE EMISSIONS	
Washington (Cont.d)	9.07 Puget Sound APA	$E = 4.12P^{0.668}$	$P<50$ tons/hr
		$E = 8.344P^{0.482}$	$50 \leq P \leq 90$ tons/hr
		$E = 13.64P^{0.371}$	$90<P \leq 130$
		$E = 37.0P^{0.166}$	$130<P \leq 150$
		$E = 21.43P^{0.275}$	$150<P \leq 400$
		$E = 43.23P^{0.156}$	$400<P \leq 1000$
		$E = 64.21P^{0.100}$	$1000<P \leq 5000$ tons/hr
West Virginia	VII, 3.01	Found from Process Weight Rate Table	

P = Input process rate (tons/hr)

E = Emissions (lbs/hr)

5.0 BIBLIOGRAPHY

DE-151 Dealy, James O., and Arthur M. Killin, Engineering and Cost Study of the Ferroalloy Industry, EPA 450/2-74-008, North Carolina, May, 1974.

EN-128 Environmental Protection Agency (Office of Air Quality Planning & Standards), Standard Support Document, "An Investigation of the Best Systems of Emission Reduction for Electric Submerged Arc Furnaces Producing Ferroalloys", Draft, Research Triangle Park, N.C., 1974.

EN-071 Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, 2nd Ed., with supplements, AP-42, Research Triangle Park, N.C., 1973.

US-144 U. S. Bureau of Mines, Minerals Yearbook 1973, Vol. 1, Metals, Minerals, and Fuels, Washington, D. C., 1974.

US-064 U.S. Department of the Interior, Bureau of Mines, Minerals Yearbook 1970, Vol. 1, Metals, Minerals, and Fuels, Pittsburgh, Pa., 1972.

VA-091 Vandergrift, A. E., et al., Particulate Pollutant System Study, Volume 1, Mass Emissions, PB 203 128, Contract No. CPA-22-69-104, Kansas City Missouri, Midwest Research Institute, 1971.

6.0 DATA SOURCES, SUMMARIES, AND TABLES OF INDIVIDUAL PLANTS

This section describes Radian's study of individual ferroalloy plants which included data gathering, analysis, and presentation.

6.1 Sources of Data

6.1.1 Processes and Emissions

The Minerals Yearbook was the most complete source of ferroalloy plant locations and product type. Type and numbers of furnaces and individual plant production were not available. The National Emissions Data System (NEDS) was used to supplement the Bureau of Mines, Minerals Yearbook data. A NEDS point source listing for SIC 3313, created on 6 December 1974 was used.

6.1.2 Compliance Status

Three data sources were used in common for all EPA regions: (1) a CDS Quick Look Report (QL) of compliance status of all sources as of 8 May 1975, (2) a CDS QL report of all increments of progress scheduled beyond 1974, and (3) a CDS Source Data Report for SIC 3313 as of 19 December 1974.

All regional offices were contacted by phone to obtain compliance status information not in CDS. Some regions had data which was in the process of being added to CDS and was unavailable. The following supplementary data was available and was used in this study.

Region I - None

Region II - CDS Source Data Reports for all sources as of 23 April 1975. Data was obtained by visit to Regional Office on 23 April 1975.

Region III - None

Region IV - CDS Source Data Reports for all sources and Semi-annual and Quarterly Reports from the states in Region IV. This data was available to Radian as a result of an on-going contract with Region IV to update CDS.

Region V - None

Region VI - CDS Source Data Reports for Louisiana and Oklahoma and data from Texas Air Control Board of compliance status of all sources in the EMS system as of 30 April 1975.

Region VII - Status of all sources was obtained by visit to RO on 21-23 April 1975.

Region VIII - Status of all sources as of 21 May 1975 was obtained by mail contact.

Region IX - The status of nine sources in neither NEDS nor CDS was obtained over the phone. Status was as of 23 May 1975.

Region X - None

6.2 Summaries of Emissions and Compliance Status

6.2.1 Emissions

No national totals of potential or actual emissions could be calculated because of insufficient process and controls data for individual sources. Another study estimated total particulate emissions from the U.S. ferroalloy industry in 1967 to be 160,000 tons, consisting of 1,000 tons from blast furnaces, 150,000 tons from electric smelting furnaces, and 9,000 tons from materials handling. An overall degree of control for the electric furnaces was estimated to be 40 percent (VA-091).

6.2.2 Compliance Status

A summary of compliance status by region is presented in Tables 6.2-1a and b according to current CDS compliance status codes as given in Table 2.6-2.

For the fifty-seven ferroalloy plants located in this study, five (9%) were reported to be in compliance, nine (16%) out of compliance, and forty-three (75%) unknown. These catagories are subdivided as follows: three plants (5%) were in compliance with emission limitations as determined by source test, inspection, or state certification, two plants (4%) were in compliance with the increments of progress of a schedule, three plants (5%) were out of compliance with emission limitations, six plants (11%) were out of compliance with the increments of progress of a compliance schedule, twenty-four plants (42%) had unknown status with respect to emission limitations, and nineteen plants (33%) had unknown compliance with increments of progress of a schedule.

TABLE 6.2-1a

FERROALLOY PLANTS

CATEGORICAL SUMMARY OF COMPLIANCE STATUS BY REGION

MAY, 1975

REGION	IN		OUT		UNKNOWN		TOTAL
	IN COMPLIANCE EMISSION LIMITATION	IN COMPLIANCE WITH SCHEDULE	OUT OF COMPLIANCE EMISSION LIMITATION	OUT OF COMPLIANCE WITH SCHEDULE	UNKNOWN COMPLIANCE EMISSION LIMITATION	UNKNOWN COMPLIANCE WITH SCHEDULE	
I	0	0	0	0	0	0	0
II	0	0	0	0	4	1	5
III	0	0	1	3	3	6	13
IV	0	0	0	0	9	11	20
V	0	2	0	0	6	1	9
VI	0	0	1	1	0	0	2
VII	0	0	0	1	0	0	1
VIII	0	0	1	0	0	0	1
IX	0	0	0	0	0	0	0
X	3	0	0	1	2	0	6
TOTAL	3	2	3	6	24	19	57
	(5%)	(4%)	(5%)	(11%)	(42%)	(33%)	
TOTAL	5 (9%)		9 (16%)		43 (75%)		57

TABLE 6.2-1b
EXISTING PRIMARY FERROALLOY PLANTS
SUMMARY OF COMPLIANCE STATUS BY REGION

ENTIRE SOURCE
COMPLIANCE STATUS CODE*
MAY 1975

REGION	0	1	2	3	4	5	6	7	TOTAL
I	0	0	0	0	0	0	0	0	0
II	4	0	0	0	0	0	0	1	5
III	3	1	0	0	0	0	3	6	13
IV	9	0	0	0	0	0	0	11	20
V	6	0	0	0	0	2	0	1	9
VI	0	1	0	0	0	0	1	0	2
VII	0	0	0	0	0	0	1	0	1
VIII	0	1	0	0	0	0	0	0	1
IX	0	0	0	0	0	0	0	0	0
X	2	0	1	1	1	0	1	0	6
TOTALS	24	3	1	1	1	2	6	19	57

* Refer to Table 6.2-2

TABLE 6.2-2

COMPLIANCE STATUS CODES

CODE	DESCRIPTION
0	Unknown
1	Not in compliance - no schedule
2	In compliance - source test
3	In compliance - inspection
4	In compliance - certification
5	In compliance with increments of progress
6	Not in compliance with increments of progress
7	Unknown compliance with increments of progress
8	No applicable state regulation
9	Sources with potential emissions >100 TPY and <100 TPY actual emissions - compliance status unknown

6.3 Data Tables of Individual Sources

This section presents the data gathered for each ferroalloy plant. The data for each source is presented in a three-page format described below. A referencing system is used to consecutively number the sources in each state according to AQCR and county SAROAD number. The reference numbering system starts at "1" for each state. The reference number is also used to identify the source on PG 2/3 and PG 3/3.

PG 1/3 is an entire source (plant) summary of company name, source location (city), AQCR and particulate priority, SAROAD numbers, NEDS, CDS, and state source identification numbers, design and operating source production rate in thousand tons of product per year, and entire source compliance status code (See Table 6.2-3). Data sources are referenced by superscript footnotes. Compliance status was extracted from CDS entire source compliance status unless footnoted otherwise. In those cases where the entire source compliance status was found to be inconsistent with the status of the individual points, the proper CDS code for the entire source was selected, entered, and footnoted. If the source was listed in CDS with an SIC code other than 3313, that SIC is presented below the CDS source number.

PG 2/3 is a listing of point source processes (operations which have EPA emission factors), control equipment, operating (production) rate from NEDS

in thousand tons per year (KTPY), total particulate (PT) potential emissions at design capacity and operating production rate, actual particulate emissions, and allowable emissions in pounds per hour (PPH) and tons per year (TPY) both for design and operating conditions. All data from NEDS is footnotes. Control equipment codes used are listed in Appendix 1.

PG 3/3 is a listing of compliance status for individual processes as found in CDS. Only compliance schedules are presented which have final compliance date of 1 January 1975 and beyond. Any CDS points with schedules due before 1 January 1975 are presented in this report with the designation "SCHEDULE EXPIRED BEFORE 1975." Some CDS points with schedules were listed with an improper compliance status code. In this report these points have compliance status code "7" with a footnote to show the actual code found in CDS. Any entire source listed as in compliance with emission limitations, i.e., codes 2, 3, or 4 will have all points in compliance by definition. Compliance schedule increments of progress are 01, plan submittal; 02, award contracts; 03, initiate construction; 04, complete construction; 05, final compliance.

Tables 6.3-1 to 6.3-16 are the tables of data for the fifty-seven ferroalloy plants located in this study.

REGION II

TABLES 6.3-1 TO 6.3-2

TABLE 6.3-1 SOURCE SUMMARY - EXISTING SOURCES

REGION II INDUSTRY FERROALLOY SIC 3313 STATE NEW JERSEY PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Shieldalloy Corp Newfield	045/I	31	1760			00020 SIC 33990				7 [2]

FOOTNOTES: [1] NEDS data

[2] Listed as 1 in CDS

TABLE 6.3-1 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION II INDUSTRY FERROALLOY SIC 3313 STATE NEW JERSEY PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL		ACTUAL[1]	DESIGN		OPER	
					DESIGN	OPER[1]		PPH	TPY	PPH	TPY[1]
1	Aluminothermic Furnace[2]										

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-1 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION II INDUSTRY FERROALLOY SIC 3313 STATE NEW JERSEY PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	Rotary Kiln Stack	PT	002	7					07/31/75

FOOTNOTES:

TABLE 6.3-2 SOURCE SUMMARY - EXISTING SOURCES

REGION II INDUSTRY FERROALLOY SIC 3313 STATE NEW YORK PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Hanna Furnace Corp Buffalo	162/I	33	2000	0660		00122 NO SIC				0
2	Airco Alloys & Carbide Niagara Falls	162/I	33	4720	4740		00012 NO SIC				0
3	N.L. Ind Inc Niagara Falls	162/I	33	4720	4740		00054 NO SIC				0
4	Union Carbide Niagara Falls	162/I	33	4720	4740		00043				0

FOOTNOTES: [1] NEDS data

TABLE 6.3-2 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION II INDUSTRY FERROALLOY SIC 3313 STATE NEW YORK PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL		ACTUAL[1]	DESIGN		OPER	
					DESIGN	OPER[1]		PPH	TPY	PPH	TPY[1]
1	Blast Furnace[4]	PT									
2	2 30MW Furnaces	PT									
3	Electric Furnace[2]	PT									
4	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

[4] Minerals Yearbook 1972

TABLE 6.3-2 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION II INDUSTRY FERROALLOY SIC 3313 STATE NEW YORK PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	No Data								
2	No Data								
3	No Data								
4	No Data								

FOOTNOTES:

REGION III

TABLES 6.3-3 TO 6.3-4

TABLE 6.3-3 SOURCE SUMMARY - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE PENNSYLVANIA PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Reading Alloys Robesonia	151/I	39	0720			00026 SIC 3339				6
2	New Jersey Zinc Co Palmerton	151/I	39	1380	6940		00003 NO SIC				7
3	Kawecki Chem Co Easton	151/I	39	6580	2720						0
4	Mercer Alloys Pymatung	178/I	39	5660			00010				7 [3]
5	Bethlehem Steel Corp Johnstown	195/I	39	1300	4460		00006 SIC 3312				7 [2]
6	U.S. Steel Corp Clairton	197/I	39	0100	1720		00032				7 [3]

FOOTNOTES:
[1] NEDS data
[2] Listed as 0 in CDS
[3] Listed as 1 in CDS

TABLE 6.3-3 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE PENNSYLVANIA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL		ACTUAL[1]	DESIGN		OPER	
					DESIGN	OPER[1]		PPH	TPY	PPH	TPY[1]
1	Aluminothermic Furnace[2]	PT									
2	Electric Furnace[2]	PT									
3	Aluminothermic Furnace[2]	PT									
4	No Data										
5	Blast Furnace[2]	PT									
6	Blast Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-3 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE PENNSYLVANIA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	Anode Reverbatory Fnce		010	7[1]				05/21/75	05/21/75
	Anode Reverbatory Fnce		015	7[1]				DO	DO
	Billet Reverbatory Fnce		020	7[1]				DO	DO
	Billet Reverbatory Fnce		025	7[1]				DO	DO
2	A & B Vert Retort		040	7[1]					05/22/75
	A & B Vert Retort		045	7[1]					DO
	Four Waelz Ililns		050	7[1]				07/31/75	07/31/75
	Acid Dept Sinter Machine		051	7[1]				04/21/75	05/22/75
	No. 2 & No. 3 Roasters		081	7[1]				04/22/75	DO
3	No Data								
4	Electric Furnace		010	7[1]	SCHEDULE EXPIRED BEFORE 1975				
5	Sintering Mach Wind Box		010	7[1]	05/01/75	10/01/75	10/01/76	05/01/77	07/01/77
	Sintering Mach Wind Box		015	7[1]	DO	DO	DO	DO	DO
	Sinter Plant Cooler		020	7[1]	DO	DO	DO	DO	DO
	Sinter Plant Cooler		025	7[1]	DO	DO	DO	DO	DO
	3 open Hearth Furnaces		030	7[1]	07/01/75				12/31/75

FOOTNOTES: [1]Listed as 1 in CDS

TABLE 6.3-3 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE PENNSYLVANIA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
5	3 Open Hearth Furnaces		035	7[1]	DO				DO
Cont	5 Open Hearth Furnaces		040	7[1]	DO				11-01/78
	5 Open Hearth Furnaces		045	7[1]	DO				DO
	Burning Operation		050	7[1]	01/01/75	06/01/75	02/01/76	05/01/76	07/01/76
	Burning Operation		055	7[1]	DO	DO	DO	DO	DO
	Open Hearth Leaded Steel		060	7[1]		01/05/75	03/05/75	09/03/75	10/01/75
	Open Hearth Leaded Steel		065	7[1]		DO	DO	DO	DO
6	Storage Tanks		062	7[1]			03/01/75	05/15/75	05/15/75
	Coke Oven Gas Combustion		071	7[1]					02/01/75
	Coke Oven Gas Underfiring		081	7[1]					DO
	Claus Sulfur Recov Plant		091	7[1]					DO

FOOTNOTES: [1] Listed as 1 in CDS

TABLE 6.3-3 SOURCE SUMMARY - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE PENNSYLVANIA PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
7	U.S. Steel Corp. McKeesport	197/I	39	0100	5380		00011				1
8	Climax Molybdenum Langeloth	197/I	39	9200			00044 NO SIC				6
9	Molybdenum Corp. of America Washington	197/I	39	9200	9190		00026				6

FOOTNOTES: 1 NEDS data

TABLE 6.3-3 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE PENNSYLVANIA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL		ACTUAL[1]	DESIGN		OPER	
					DESIGN	OPER[1]		PPH	TPY	PPH	TPY[1]
7	Blast Furnace[2]	PT									
8	Aluminothermic[2] Furnace	PT									
9	Electric & Alumino-thermic Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-3 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE PENNSYLVANIA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
7	No Data								
8	6 Herreschoff Roasters		011	7[1]					03/19/75
9	No Data								

FOOTNOTES:

[1] Listed as 1 in CDS

TABLE 6.3-4 SOURCE SUMMARY - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE WEST VIRGINIA PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Foote Mineral Co New Haven	103/I	50	1060		0004	00004				7 [2]
2	Union Carbide Corp Alloy	234/I	50	0460		0001	00001 SIC 3312				7 [2]
3	Foote Mineral Corp. Graham	235/I	50	0980							0
4	Diamond Shamrock Kingwood	235/I	50	1520	0820						0

FOOTNOTES: [1] NEDS data
[2] Listed as 0 in CDS

TABLE 6.3-4 POINT EMISSIONS - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE WEST VIRGINIA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
1	Electric Furnace[2]	PT	None			17500					175
	Electric Furnace[2]	PT	None			5840					58
	Electric Furnace[2]	PT	None			3400					34
	Electric Furnace[2]	PT	None			5550					56
	Electric Furnace[2]	PT	None			526					5
	Electric Furnace[2]	PT	None			438					6
	Electric Furnace[2]	PT	None			692					12
2	Electric Furnace[2]	PT	None			1310					13
	Electric Furnace[2]	PT	None			1310					13
	Electric Furnace[2]	PT	None			1100					28
	Electric Furnace[2]	PT	None			4710					47
	Electric Furnace[2]	PT	None			3150					47
	Electric Furnace[2]	PT	None			1770					26
	Electric Furnace[2]	PT	None			3500					35
	Electric Furnace[2]	PT	None			516					101
	Electric Furnace[2]	PT	None			3070					31
	Electric Furnace[2]	PT	NOne			5740					57
	Electric Furnace[2]	PT	None			5740					57
	Electric Furnace[2]	PT	None			1310					13
	Electric Furnace[2]	PT	None			1420					110
	Electric Furnace[2]	PT	None			810					8
	Electric Furnace[2]	PT	None			394					66

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-4 POINT EMISSIONS - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE WEST VIRGINIA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
3	Electric Furnace[2]	PT									
4	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-4 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION III INDUSTRY FERROALLOY SIC 3313 STATE WEST VIRGINIA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	#3 Furnace (10 MUA)		020	7[1]					06/01/75
	#3 Furnace (10 MUA)		025	7[1]					DO
	#6 Furnace (10 MUA)		040	7[1]					DO
	#6 Furnace (10 MUA)		045	7[1]					DO
2	Furnace #13		210	7[2]					01/01/75
	Furnace #13		215	7[2]					DO
	Furnace #13 Tap Hole		220	7[2]					DO
	Furnace #13 Tap Hole		225	7[2]					DO
	Furnace #16		270	7[2]					DO
	Furnace #16		275	7[2]					DO
3	No Data								
4	No Data								

FOOTNOTES: [1]Listed as 1 in CDS

[2]Listed as 0 in CDS

REGION IV

TABLES 6.3-5 TO 6.3-10

TABLE 6.3-5 SOURCE SUMMARY - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE ALABAMA PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Alabama Metallurgical Corp Selma	001/II	01	1000	3020	0001				0.4	0
2	Woodward Iron Co Woodward	004/I	01	1980		0440	00440			13.0	7
3	Airco Alloys & Carbide Theodore	005/I	01	2400		8001	08001 00014			79.0	7
4	Tennessee Valley Authority Muscle Shoals	007/I	01	0800	2560						0
5	Union Carbide Corp Sheffield	007/I	01	0800	3040	0009	00019			6.3	0
6	Tennessee Alloys Corp Bridgeport	007/I	01	1920	0460		00007 SIC 3339				0

FOOTNOTES: [1] NEDS data

TABLE 6.3-5 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE ALABAMA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
1	Furnace[3]	PT	None	0.4		168					8
2	Electric Furnace[2]	PT	None	13.0		854					15
3	Electric Arc Furnace[1]	PT	WS 98.0%	79.0		73					61
4	Electric Furnace[2]	PT									
5	Electric Furnace[2]	PT	WS 98.0%	6.3		705					57
6	Electric Furnace[2]										

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-5 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE ALABAMA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	No Data								
2	Ferosilicon Elec Fnc	PT	002	7	SCHEDULE EXPIRED BEFORE 1975				
3	Crushing & Sizing	PT	901	7	SCHEDULE EXPIRED BEFORE 1975				
4	No Data								
5	No Data								
6	No Data								

FOOTNOTES:

TABLE 6.3-5 SOURCE SUMMARY - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE ALABAMA PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
7	Ohio Ferro Alloy[2] Montgomery	002/I	01	2480	2460						0

FOOTNOTES: [1] NEDS data

[2] New plant under construction, on line in 1976

TABLE 6.3-5 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE ALABAMA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
7	No Data										

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-5 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE ALAMABA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
7	No Data								

FOOTNOTES:

TABLE 6.3-6 SOURCE SUMMARY - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE FLORIDA PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Florida Machine & Fory Jacksonville	049/I	10	1080	1960	0033				9.1	0
2	Stauffer Chem Co Tarpon Springs	052/I	10	3600	4380		00042 NO SIC				7
3	Agrico Chem Co Pierce	052/I	10	3680			00054 NO SIC				7
4	Mobil Chem Co Nichols	052/I	10	3680			00047 NO SIC				7

FOOTNOTES: [1] NEDS data

TABLE 6.3-6 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE FLORIDA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
1	Furnace[3]	PT	BH 99.5%	9.1			1				12
2	Electric Furnace[2]	PT									
3	No Data										
4	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-6 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE FLORIDA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	No Data								
2	Dodolizing Kiln	PT	003	7[1]				04/04/75	06/01/75
	Kiln Off Gas Scrubber	PT	004	7[1]				DO	DO
	Phosphorus Furnace	PT	008	7[1]				DO	DO
	Bunker C Fuel Boiler	S2	009	7[1]				DO	DO
3	Phos Complex	PT	001	7[1]				05/04/75	07/01/75
4	Phos Rock Calciner	PT	003	7[1]				05/04/75	07/01/75
	Phos Rock Calciner	PT	004	7[1]				DO	DO

FOOTNOTES:

[1] Listed as 1 in CDS

TABLE 6.3-7 SOURCE SUMMARY - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE KENTUCKY PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Airco Alloy & Carbide Calvert City	072/I	18	2600		0002	00002 SIC 3312			168.0	7

FOOTNOTES: [1] NEDS data

TABLE 6.3-7 POINT EMISSIONS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE KENTUCKY PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
1	Electric Furnace[2]	PT	None	18.3		3710					67
	Electric Furnace[2]	PT	None	33.6			8300				105
	Electric Furnace[2]	PT	None	65.7			9610				127
	Electric Furnace[2]	PT	None	16.8		1970					61
	Electric Furnace[2]	PT	None	16.8		1970					61
	Electric Furnace[2]	PT	None	16.8		1970					61

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-7 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE KENTUCKY PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	Alloy Furnace 15	PT	009	7[1]				04/01/75	04/01/75
	Alloy Furnace 16	PT	010	7[1]				DO	DO

FOOTNOTES: [1] Listed as 1 in CDS

TABLE 6.3-8 SOURCE SUMMARY - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE SOUTH CAROLINA PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Airco Alloys & Carbide Charleston	199/I	42	0560	0540	0018				447.0	0

FOOTNOTES: [1] NEDS data

TABLE 6.3-8 POINT EMISSIONS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE SOUTH CAROLINA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
1	Electric Furnace[2]	PT	ESP 99.0%	219.0			137				155
	Electric Furnace[2]	PT	ESP 99.0%	228.0			33				159

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-8 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE SOUTH CAROLINA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	No Data								

FOOTNOTES:

TABLE 6.3-9 SOURCE SUMMARY - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE TENNESSEE PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Tennessee Metallurgical Co Kimball	007/I	44	2220		0005	00005			64.8	7
2	Chromium Mining & Smelting Woodstock	018/I	44	3080		0521	00521 SIC 3339				7
3	Roane Electric Rockwood	207/I	44	2880	2920	0011	00011				7
4	Woodward Iron Co Rockwood	207/I	44	2880	2920						0
5	Hooker Chem Corp Columbia	208/I	44	2300	0580						0
6	Monsanto Chem Co Columbia	208/I	44	2300	0580		00006 SIC 2819				7

FOOTNOTES: [1] NEDS data

TABLE 6.3-9 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE TENNESSEE PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
1	Electric Furnace[2]	PT	None	4.6		1850					630
	Electric Furnace[2]	PT	None	4.6		450					440
	Electric Furnace[2]	PT	None	4.6		1850					630
	Electric Furnace[2]	PT	None	25.5		860					840
	Electric Furnace[2]	PT	None	25.5		860					750
2	Electric Furnace[2]	PT	None			1600					
	Electric Furnace[2]	PT	None			1600					
	Electric Furnace[2]	PT	None			1600					
3	Furnace[3]	PT	None			237					37
	Furnace[3]	PT	None								1
	Furnace[3]	PT	None				257				37
	Furnace[3]	PT	None				1400				38
	Furnace[3]	PT	None			1350					38
	Furnace[3]	PT	None			1370					38
	Furnace[3]	PT	None			1370					38
	Furnace[3]	PT	None			1350					38
	Furnace[3]	PT	None			400					
4	Electric Furnace[2]	PT									
5	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-9 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE TENNESSEE PG 2/3 CONT'D

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL		ACTUAL[1]	DESIGN		OPER	
					DESIGN	OPER[1]		PPH	TPY	PPH	TPY[1]
6	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-9 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE TENNESSEE PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	Furn No. 1-Stil No. 3	PT	003	7	SCHEDULE EXPIRED BEFORE 1975				
	Furn No. 1-Stil No. 4	PT	004	7	DO	DO	DO	DO	
	Furn No. 1-Stil No. 5	PT	005	7	DO	DO	DO	DO	
	Furn No. 2-Stil No. 9	PT	008	7	DO	DO	DO	DO	
	Furn No. 2-Stil No. 10	PT	009	7	DO	DO	DO	DO	
2		PT	001	7	SCHEDULE EXPIRED BEFORE 1975				
3	Electric Fnc-Metal Alloy 1	PT	001	7	SCHEDULE EXPIRED BEFORE 1975				
	Electric Fnc-Metal Alloy 2	PT	002	7	DO	DO	DO	DO	
	Electric Fnc-Metal Alloy 3	PT	003	7	DO	DO	DO	DO	
	Electric Fnc-Metal Alloy 4	PT	004	7	DO	DO	DO	DO	
	Electric Fnc-Metal Alloy 5	PT	005	7	DO	DO	DO	DO	
	Electric Fnc-Metal Alloy 6	PT	006	7	DO	DO	DO	DO	
	Electric Fnc-Metal Alloy 7	PT	007	7	DO	DO	DO	DO	
	Electric Fnc-Metal Alloy	PT	009	7	DO	DO	DO	DO	
4	No Data								
5	No Data								

FOOTNOTES:

TABLE 6.3-9 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE TENNESSEE PG3/3 CONT'D

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
6	#1 Nodulizing Kiln	S2	006	7				05/01/75	07/01/75
	#2 Nodulizing Kiln	S2	007	7				DO	DO
	#3 Kiln Discharge	S2	008	7				DO	DO

FOOTNOTES:

TABLE 6.3-9 SOURCE SUMMARY - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE TENNESSEE PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
7	Stauffer Chem Co Mt. Pleasant	208/I	44	2300	2500		00009 SIC 2819				7

FOOTNOTES: [1] NEDS data

TABLE 6.3-9 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE TENNESSEE PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL		ACTUAL[1]	DESIGN		OPER	
					DESIGN	OPER[1]		PPH	TPY	PPH	TPY[1]
7	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-9 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION IV INDUSTRY FERROALLOY SIC 3313 STATE TENNESSEE PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
7	No Data								

FOOTNOTES:

REGION V

TABLE 6.3-10

TABLE 6.3-10 SOURCE SUMMARY - EXISTING SOURCES

REGION V INDUSTRY FERROALLOY SIC 3313 STATE OHIO PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Union Carbide Corp Ashtabula	178/II	36	0220	0200	0014	00014			550.0	5
2	Interlake Steel Corp Beverly	179/I	36	7100							0
3	Union Carbide Corp Marietta	179/I	36	7100	3920	0016	00016			871.8	5
4	Ohio Ferro Alloy Corp Powhatan	181/I	36	0540							0
5	Ohio Ferro Alloy Corp Canton	181/I	36	1440	1000	0033				27.0	0
6	Foote Mineral Steubenville (Vanco-ram)	181/I	36	3160						806.0	0

FOOTNOTES: [1] NEDS data

TABLE 6.3-10 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION V INDUSTRY FERROALLOY SIC 3313 STATE OHIO PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
1	Electric Furnace[1]	PT	WS 99.0%	51.8							
	Electric Furnace[1]	PT	WS 99.0%	123.0							
	Electric Furnace[1]	PT	WS 99.0%	49.5							
	Electric Furnace[1]	PT	WS 99.0%	33.1							
	Electric Furnace[1]	PT	WS 98.4%	146.0							
	Electric Furnace[1]	PT	WS 99.0%	38.0							
	Electric Furnace[1]	PT	WS 99.0%	43.8							
	Electric Furnace[1]	PT	WS 99.0%	64.8							
2	Electric Furnace[2]	PT									
3	Electric Furnace[2]	PT	WS 98.6%	156.0			59				
	Electric Furnace[2]	PT	WS 80.0%	55.0			1010				

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-10 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION V INDUSTRY FERROALLOY SIC 3313 STATE OHIO PG 2/3 CONT'D

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
3 cont	Electric Furnace[2]	PT	WS 93.6%	61.5			392				
	Electric Furnace[2]	PT	WS 95.0%	43.8			179				
	Electric Furnace[2]	PT	WS 95.9%	43.9			180				
	Electric Furnace[2]	PT	WS 97.0%	36.8			122				
	Electric Furnace[2]	PT	WS 95.2%	47.5			230				
	Electric Furnace[2]	PT	WS 95.7%	45.8			200				
	Electric Furnace[2]	PT	WS 95.7%	177.0			77				
	Electric Furnace[2]	PT	WS 93.0%	79.5			58				
	Electric Furnace[2]	PT	WS 80.0%	125.0			255				
4	Electric Furnace[2]	PT									
5	Furnace[3]	PT	BH 99.0%	27.0			55				

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-10 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION V INDUSTRY FERROALLOY SIC 3313 STATE OHIO PG 2/3 CONT'D

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
6	Electric Furnace[2]	PT	None	806.0		42800					

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-10 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION V INDUSTRY FERROALLOY SIC 3313 STATE OHIO PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	No Data								
2	No Data								
3	No Data								
4	No Data								
5	No Data								
6	No Data								

FOOTNOTES:

TABLE 6.3-10 SOURCE SUMMARY - EXISTING SOURCES

REGION V INDUSTRY FERROALLOY SIC 3313 STATE OHIO PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
7	Ohio Ferro Alloy Corp Brilliant	181/I	36	3160		0010				69.0	0
8	Foote Mineral Co Cambridge	183/II	36	2680	0940						0
9	Ohio Ferro-Alloy Philo (Wapakoneta)	183/II	36	4640	7000	0010	00010				7 [2]

FOOTNOTES: [1] NEDS data

[2] Listed as 1 in CDS

TABLE 6.3-10 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION V INDUSTRY FERROALLOY SIC 3313 STATE OHIO PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
7	Electric Furnace[2]	PT	None	69.0		6890					
8	Electric Furnace[2]	PT									
9	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-10 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION V INDUSTRY FERROALLOY SIC 3313 STATE OHIO PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
7	No Data								
8	No Data								
9	P001 Arc Furnace #18		010	7 [1]					07/01/75
	P002 Arc Furnace #16		020	7 [1]					DO
	P003 Arc Furnace #11		030	7 [1]					DO
	P004 Arc Furnace #13		040	7 [1]					DO
	P007 Arc Furnace #12		050	7 [1]					DO
	P008 Arc Furnace #15		060	7 [1]					DO
	P018 Plunging Room		070	7 [1]					DO

FOOTNOTES:

[1] Listed as 0 in CDS

REGION VI

TABLE 6.3-11

TABLE 6.3-11 SOURCE SUMMARY - EXISTING SOURCES

REGION VI INDUSTRY FERROALLOY SIC 3313 STATE TEXAS PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Cameron Iron Works Cypress (Houston)	216/I	45	2330			00002 NO SIC				1[2]
2	Tenn-Tex Alloy Chem Corp of Houston Houston	216/I	45	2330	2560		00141 NO SIC				6[2]

FOOTNOTES: [1] NEDS data

[2] State Office

TABLE 6.3-11 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION VI INDUSTRY FERROALLOY SIC 3313 STATE TEXAS PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL		ACTUAL[1]	DESIGN		OPER	
					DESIGN	OPER[1]		PPH	TPY	PPH	TPY[1]
1	No Data										
2	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-11 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION VI INDUSTRY FERROALLOY SIC 3313 STATE TEXAS PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1				1[1]					
2				6[1]					

FOOTNOTES:

[1] State Office

REGION VII

TABLE 6.3-12

TABLE 6.3-12 SOURCE SUMMARY - EXISTING SOURCES

REGION VII INDUSTRY FERROALLOY SIC 3313 STATE IOWA PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Foote Mineral Co Keokuk	065/I	16	2240		0045 0010	00003 SIC 3312			239.0	6

FOOTNOTES: [1] NEDS data

TABLE 6.3-12 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION VII INDUSTRY FERROALLOY SIC 3313 STATE IOWA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
1	Electric Furnace[2]	PT		41.0		6460					
	Electric Furnace[2]	PT		83.0		13100					80
	Electric Furnace[2]	PT		115.0		18100					105

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-12 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION VII INDUSTRY FERROALLOY SIC 3313 STATE IOWA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	Furnace No. 9			6	03/01/74	06/01/74	10/01/74	06/01/75	06/01/75
	Kish Handling Facility #9			6	03/01/74	06/01/74	10/01/74	06/01/75	06/01/75
	Kish Handling Facility #10			6	03/01/74	06/01/74	10/01/74	06/01/75	06/01/75

FOOTNOTES:

REGION VIII

TABLE 6.3-13

TABLE 6.3-13 SOURCE SUMMARY - EXISTING SOURCES

REGION VIII INDUSTRY FERROALLOY SIC 3313 STATE MONTANA PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Stauffer Chem Co Silver Bow	142/IA	27	1480		0005	00005 SIC 2819				1

FOOTNOTES: [1] NEDS data

TABLE 6.3-13 POINT EMISSIONS AND ALLOWABLE-EXISTING SOURCES

REGION VIII INDUSTRY FERROALLOY SIC 3313 STATE MONTANA PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER	ACTUAL	PPH	TPY	PPH	TPY
1	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS Data

[2] Bureau of Mines Minerals Yearbook - 1973

[3] Type of Furnace Unknown

TABLE 6.3-13 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION VIII INDUSTRY FERROALLOY SIC 3313 STATE MONTANA PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	No Data								

FOOTNOTES:

REGION X

TABLES 6.3-14 TO 6.3-16

TABLE 6.3-14 SOURCE SUMMARY - EXISTING SOURCES

REGION X INDUSTRY FERROALLOY SIC 3313 STATE IDAHO PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	FMC Corp Pocatello	061/I	13	0080	1240	0005	00005 NO SIC				0
2	Monsanto Chem Co Soda Springs	061/I	13	0420	1430	0001	00001 SIC 2819				2

FOOTNOTES: [1] NEDS data

TABLE 6.3-14 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION X INDUSTRY FERROALLOY SIC 3313 STATE IDAHO PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL		ACTUAL[1]	DESIGN		OPER	
					DESIGN	OPER[1]		PPH	TPY	PPH	TPY[1]
1	Electric Furnace[2]	PT									
2	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-14 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION X INDUSTRY FERROALLOY SIC 3313 STATE IDAHO PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	No Data								
2			ALL	2					

FOOTNOTES:

TABLE 6.3-15 SOURCE SUMMARY - EXISTING SOURCES

REGION X INDUSTRY FERROALLOY SIC 3313 STATE OREGON PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Union Carbide Corp Portland	193/I	38	1240	1460	1873	10004 SIC 3323				3
2	Hanna Nickel Smelting Co Riddle	194/II	38	0520		0007	00033 SIC 3339				4

FOOTNOTES: [1] NEDS data

TABLE 6.3-15 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION X INDUSTRY FERROALLOY SIC 3313 STATE OREGON PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL		ACTUAL[1]	DESIGN		OPER	
					DESIGN	OPER[1]		PPH	TPY	PPH	TPY[1]
1	Electric Furnace[2]	PT									
2	Electric Furnace[2]	PT									

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-15 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION X INDUSTRY FERROALLOY SIC 3313 STATE OREGON PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1			ALL	3					
2			ALL	4					

FOOTNOTES:

TABLE 6.3-16 SOURCE SUMMARY - EXISTING SOURCES

REGION X INDUSTRY FERROALLOY SIC 3313 STATE WASHINGTON PG 1/3

REFERENCE NUMBER	SOURCE LOCATION	AQCR/ PRIORITY PT	SAROAD CODING NUMBERS			SOURCE ID NUMBERS			SOURCE PRODUCTION RATE-KTPY		SOURCE COMPLIANCE STATUS
			STATE	COUNTY	CITY	NEDS	CDS	STATE	DESIGN	OPER [1]	
1	Foote Mineral Co Wenatchee[2]	227/II	49	0520	2340	0001	00001			29.5	6
2	Ohio Ferro Alloy Co Tacoma	229/II	49	1560	2140	0004	00004				0

FOOTNOTES: [1] NEDS data

[2] Listed in CDS as Hanna Mining Co, Rock Island (East of Wenatchee)

TABLE 6.3-16 POINT EMISSIONS AND ALLOWABLE - EXISTING SOURCES

REGION X INDUSTRY FERROALLOY SIC 3313 STATE WASHINGTON PG 2/3

REFERENCE NUMBER	POINT SOURCE DESCRIPTION	POLLUTANT	CONTROL EQUIPMENT-EFFICIENCY[1]	NEDS POINT SOURCE OPER RATE KTPY	EMISSIONS - TPY			SIP ALLOWABLES			
					POTENTIAL			DESIGN		OPER	
					DESIGN	OPER[1]	ACTUAL[1]	PPH	TPY	PPH	TPY[1]
1	Electric Furnace[2]	PT	None	12.5		7150	17900				
	Electric Furnace[2]	PT	None	17.0		10800	17900				
2	Furnace[3]	PT	GC, BH 99.0%				132				148

FOOTNOTES [1] NEDS data

[2] Bureau of Mines Minerals Yearbook-1973

[3] Type of Furnace Unknown

TABLE 6.3-16 POINT COMPLIANCE STATUS - EXISTING SOURCES

REGION X INDUSTRY FERROALLOY SIC 3313 STATE WASHINGTON PG3/3

REFERENCE NUMBER	CDS POINT DESCRIPTION	POLLUTANT	CDS POINT	POINT COMPLIANCE STATUS	COMPLIANCE SCHEDULE INCREMENTS OF PROGRESS				
					01	02	03	04	05
1	Furnaces 1,2, & 3 Furnace 4	PT	001 ALL	6 4		05/10/74	10/31/74	05/31/75	06/30/75
2	No Data								

FOOTNOTES:

APPENDIX 1

CONTROL EQUIPMENT IDENTIFICATION CODES

CONTROL EQUIPMENT IDENTIFICATION CODES

CODE	EQUIPMENT
WS	Wet Scrubber
GC	Gravity Collector
CYCL	Centrifugal Collector
ESP	Electrostatic Precipitator
GS	Gas Scrubber
MIST ELIM	Mist Eliminator
BH	Fabric Filter
CAT	Catalytic Afterburner
INCIN	Direct Flame Afterburner
HES	High Energy Scrubber