IRON ORE1

(Data in million metric tons of usable ore, 2 unless noted)

<u>Domestic Production and Use</u>: The value of usable ore shipped from mines in Minnesota, Michigan, and six other States in 1998 was estimated at \$1.9 billion. Twelve iron ore production complexes with 12 mines, 10 concentration plants, and 10 pelletizing plants were in operation during the year. The mines included 11 open pits and 1 underground operation. Virtually all ore was concentrated before shipment. Nine mines operated by five companies accounted for 99.5% of production.

Salient Statistics—United States:	<u> 1994</u>	<u> 1995</u>	<u> 1996</u>	<u> 1997</u>	<u> 1998°</u>
Production, usable	58.5	62.5	62.1	63.0	62.0
Shipments	57.8	61.1	62.2	62.8	62.0
Imports for consumption	17.5	17.6	18.4	18.6	18.5
Exports	5.0	5.3	6.3	6.3	6.4
Consumption: Reported (ore and total					
agglomerate) ³	80.2	83.1	79.6	79.5	79.0
Apparent	71.0	72.7	72.0	73.0	74.3
Price,4 U.S. dollars per metric ton	24.89	28.82	31.26	30.90	32.0
Stocks, mine, dock, and consuming					
plant, yearend, excluding byproduct ore	21.3	23.5	25.7	27.9	27.7
Employment, mine, concentrating and					
pelletizing plant, quarterly average, number	7,200	7,400	7,400	7,500	7,500
Net import reliance ⁵ as a percent of					
apparent consumption (iron in ore)	18	14	14	14	17

Recycling: Insignificant.

Import Sources (1994-97): Canada, 54%; Brazil, 26%; Venezuela, 13%; Australia, 4%; and other, 3%.

Tariff: Item	Number	Normal Trade Relations (NTR)	Non-NTR ⁶
		<u>12/31/98</u>	<u>12/31/98</u>
Concentrates	2601.11.0030	Free	Free.
Coarse ores	2601.11.0060	Free	Free.
Fine ores	2601.11.0090	Free	Free.
Pellets	2601.12.0030	Free	Free.
Briquettes	2601.12.0060	Free	Free.
Sinter	2601.12.0090	Free	Free.

Depletion Allowance: 15% (Domestic), 14% (Foreign).

Government Stockpile: None.

Events, Trends, and Issues: Worldwide, nearly all iron ore is used in steelmaking. In the United States, steelmaking accounts for about 97% of iron ore consumption. Iron ore production and consumption are concentrated in a few countries. From 1993 through 1997, iron ore was produced in at least 50 countries; the 14 largest of these countries produced 94% of the world total and no other country had as much as a 1% share. Pig iron production, the most direct indicator of iron ore consumption, also takes place in at least 50 countries, but is less concentrated. In this case, the 21 largest producers accounted for 92% of world pig iron production, with all other countries having less than a 1% share. Domestic production of iron ore is generally about 75% of domestic consumption. Thus, the United States is a net importer and from 1993 to 1997 depended on imports to satisfy 14% of its demand for iron ore. The majority of U.S. iron ore trade involves Canada. Since 1990, about 54% of U.S. imports originated in Canada and 99% of U.S. exports were shipped there. The reasons for this are ownership and proximity. Canadian steel mills have partial ownership in three of the nine iron ore operations that produce 99.5% of U.S. ore. One U.S. steelmaker and one merchant iron ore company own part of one of the three Canadian iron ore producers. The proximity of the two countries, in particular in the Great Lakes region, means lower shipping costs for iron ore producers in both countries. Most of the iron ore trade between the United States and Canada is via the Great Lakes.

From 1993 through 1997, the United States ranked sixth in iron ore production and third in pig iron production. Although world pig iron production levels have changed little over the past 20 years, production by area changed considerably. Asia, Europe, the Commonwealth of Independent States (CIS), and North America accounted for 93% of that production. While world production increased by only 11% from 1977 through 1997, pig iron production fell in the CIS by 43%, in North America by 27%, and in Europe by 9%. Production in Asia increased by 91%, and its share

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of world production increased from 26.3% in 1977 to 45.3% in 1997. This trend will probably continue, although it may be slowed by the present currency crisis.

Domestic iron ore production and consumption rates into the third quarter of the year exceeded those of 1997, but declined late in the year as the result of record imports of low-priced steel. At least two of the seven iron ore producers on the Mesabi iron range in northeastern Minnesota reduced production. In Australia, one producer ceased construction of an important new mine and another reduced production because of the financial crisis in southeast Asia. Steel consumption in the United States remained strong through most of the year, but a large portion of that consumption was satisfied by steel imports, which were cheaper for U.S. consumers partly because of the strength of the U.S. dollar against foreign currencies. In addition, foreign producers who could not sell steel products in their depressed economies increased their exports to the United States. Flat-rolled minimills under construction or proposed were expected to add 10 million to 15 million tons of capacity to the flat-rolled market by the end of the decade.

Tougher environmental regulations, especially those restricting coke oven gas emissions, were expected to force the closure of some older integrated facilities. However, those changes also provided potential benefits to those companies providing alternatives to scrap. Because of concern over the availability of low residue scrap, investment in alternative iron-making technologies has become more attractive and a number of companies have moved in that direction. One alternative to scrap is direct-reduced iron (DRI). Five projects were under consideration that, if completed, would increase U.S. DRI capacity from 0.5 million to considerably more than 4 million metric tons per year.

World Mine Production, Reserves, and Reserve Base:8

			Crude ore		Iron content	
	Mine production		Reserve		Reserve	
	<u> 1997</u>	<u>1998°</u>	Reserves	base	Reserves	base
United States	63	62	10,000	23,000	6,400	14,000
Australia	158	155	18,000	40,000	11,000	25,000
Brazil	183	180	7,600	17,000	4,800	11,000
Canada	37	37	1,700	3,900	1,100	2,500
China	243	240	25,000	50,000	7,800	15,000
India	67	65	2,800	6,200	1,800	3,900
Kazakhstan	14	14	8,300	19,000	4,500	10,000
Mauritania	12	12	700	1,500	400	1,000
Russia	71	70	20,000	45,000	11,000	25,000
South Africa	33	33	1,000	2,300	650	1,500
Sweden	22	22	3,500	7,800	2,200	5,000
Ukraine	53	50	22,000	50,000	12,000	28,000
Other countries	<u>81</u>	<u>75</u>	<u> 17,000</u>	38,000	<u>10,000</u>	23,000
World total (may be rounded)	1,040	1,020	140,000	300,000	74,000	160,000

World Resources: World resources are estimated to exceed 800 billion tons of crude ore containing more than 230 billion tons of iron. U.S. resources are estimated to be about 110 billion tons of ore containing about 27 billion tons of iron. U.S. resources are mainly low-grade taconite-type ores from the Lake Superior district that require beneficiation and agglomeration for commercial use.

<u>Substitutes</u>: Iron ore is the only source of primary iron. In some operations, ferrous scrap constitutes as much as 7% of the blast furnace burden. Scrap is extensively used in steelmaking and in iron and steel foundries.

eEstimated.

¹See also Iron and Steel Scrap.

²Agglomerates, concentrates, direct-shipping ore, and byproduct ore for consumption.

³Includes weight of lime, flue dust, and other additives used in producing sinter for blast furnaces. Consumption data are not entirely comparable to those of 1987 and earlier years owing to changes in data collection.

⁴Calculated value of ore at mines.

⁵Defined as imports - exports + adjustments for Government and industry stock changes.

⁶See Appendix B

⁷Analagous to depreciation, but applies to the ore reserve rather than the plant. Federal tax law allows this deduction from taxable corporate income, recognizing that an ore deposit is a depletable asset that must eventually be replaced by another deposit.

⁸See Appendix D for definitions.