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IRON ORE IN OCTOBER 1998

U.S. mine production of iron ore in October 1998 was 1.9% lower than that of September 1998, according to the U.S. Geological Survey. Shipments increased by 0.2% while stocks increased by 5.9%. Consumption and trade data for October 1998 will be included in a subsequent issue.

Iscor Expansion and Upgrades—Iscor Ltd., the South African iron ore producer and steelmaker, is in the midst of a major expansion and upgrading program. The company was founded by the South African Government in 1928 with the passing of the Iron and Steel Industry Act (Iscor Ltd., 1998). The first steel was tapped at the Pretoria steelworks in 1934. In the 1980's, the South African Government decided to transfer certain state interests to the private sector, and Iscor was incorporated in June 1989. As an integrated minerals and metals group, Iscor operates several iron ore mines and five steelworks. The steelworks are a scaled-down plant in Pretoria and other plants at Vanderbijlpark, Vereeniging, Cape Town, and Newcastle. Another, a joint-venture steelworks, is under construction in Saldanha. Iscor manufactures a wide range of flat and long steel products for the South African and international markets.

Iscor is the world's sixth largest iron ore producer. Its two primary iron ore mines are the 43-year-old Sishen Mine in the Northern Cape and the 65-year-old Thabazimbi Mine in the North-West Province, both of which produce hematite. These two mines supply 100% of Iscor Steel's needs of 8.6 million metric tons a year (Mt/yr). About 25% of Sishen's output is for local consumption; the ore is transported by rail to Iscor's steel plants. The balance of production is shipped by rail 861 km (535 miles) to the port of Saldanha for export. The Sishen Mine, which is one of the world's largest producers of lump iron ore, is said to contain half the world's reserves of lump ore (Iscor Ltd. home page, accessed October 16, 1998, at URL http://www.iscor.co.za/mining/sisoverv.htm). Iscor owns the rights to a large iron ore deposit near Gravelotte in the Northern Province and could join a number of South African companies in developing the resource through the construction of a direct reduction facility at Phalaborwa (Mining Journal, 1998).

The deposit at Sishen consists of large, irregular bodies containing hematite that occur adjacent to the manganese occurrences, and contains 1,000 million metric tons (Mt) of proven reserves and combined proven and estimated reserves of 1,500 Mt (Iscor, Ltd., written commun., 1998). Four types of hard high-grade ore are mined at Sishen: conglomerated, massive, laminated, and brecciated iron ore. Four types of products are produced at Sishen: lump ore (<25mm and >8mm) for blast furnaces, fine ore (<5mm and >0.2mm) for most sinter plants, coarse sinter ore (<8mm and >5mm) for sinter plants in Germany, and direct reduction ore (<30mm and >15mm). Lump ore comprises 62% of ore delivered by Sishen, with fine ore making up the remaining 38%. The pit at Sishen is relatively narrow and long. It will eventually extend to 12 km with a width of roughly 1.5 km. Mining by open-pit methods restricts the maximum depth to 375 meters. The maximum pit production capacity is 310,000 tons of ore and waste rock per day. Sishen has an average long-term stripping ratio of 2.8:1.

The hematite ore at Sishen occurs in beds of varying thickness. Interbedded impurities, such as shales, occur as bands in laminated ores, with iron enrichment at the contact zones. To meet the quality requirements of blast furnaces, selective mining methods are used. Through the separation of heavy and medium material and the mixing of high, medium, and low grade ore, both quality and ore reserves are optimized.

In 1963, the first heavy-medium separation plant, South Plant, was commissioned. In this plant, <102 and >5mm material was upgraded in two identical sections at a combined rate of 500 tons an hour. A heavy-medium cyclone plant was put into service in 1967 for the beneficiation of the <5mm material. In 1973, the South Plant was modified and extended for a production capacity of 9 Mt/yr at a rated throughput of 2,250 tons an hour. The construction of the North Plant, designed for the export of iron ore from Saldanha Bay, began in the same year and was commissioned during 1976. The design capacity of this plant was 18 Mt/yr of product at a rated throughput of 4,500 tons an hour. In 1984, production and plant utilization was rationalized. The South Plant was closed and the throughput of the North Plant stepped up to its full capacity of 18 Mt/yr. In 1990, as part of a mining upgrade, this capacity was increased to 22 Mt/yr and later 23.4 Mt/yr. The Thabazimbi Mine has 28.8 Mt of proven reserves of hematitic ore, currently producing about 2.9 Mt/yr of ore. Iscor's plans for the life of Thabazimbi Mine were revised in line

with Iscor Steel's requirements for quality and delivered cost of iron ore. Thabazimbi will in the future be run on a cash-cost basis by Iscor Mining for the benefit of Iscor Steel. All ore production will be delivered to Iscor Steel, which will cover all costs and pay Iscor Mining a management fee. The new mine plan is expected to increase the life of the Thabazimbi Mine from 12 to 18 years.

Iscor has reached a stage where all equipment is running at full capacity, leaving no room for maneuver, either in raising production or in maintaining output in the event of equipment breaking down. The company wanted to export more ore because it was thought that the market for lump ore was under-supplied. To be able to export more ore, Iscor had to increase capacity of the Sishen Mine, the Sishen-Saldanha rail line, and the port at Saldanha. Iscor is in the final stages of a feasibility study to increase the production capacity at Sishen to 27 Mt/yr. This would be accomplished over a 4-year period. Part of that effort included negotiations with several trade unions, the result of which was that Iscor began operating 7 days a week as of November 1, 1998. Iscor also has commissioned a number of new haul trucks. The result was an increase in haul truck availability from 80.1% in Iscor's 1996 fiscal year (FY) (July1996 to June1997) to 88.9% in FY 1997. Overall, Iscor will replace 32 190-ton trucks, 5 P&H 2300 shovels, and 5 rotary drills. Iscor's eventual goal is to raise production capacity at Sishen to 32 Mt/yr by 2002. Of this, 25.9 Mt/yr is to be transported to Saldanha by rail for export and for Saldanha Steel. The rail line operator, Spoornet, is spending US$28 million on improvements to the 861-km line used to transport ore from Sishen to Saldanha. At Saldanha, improvements have been made to the iron ore export infrastructure including the railway car dumper.

Iscor's plans include the Saldanha Steel Pty. Ltd. project, an integrated steelmaker capitalized at US$1.5 billion, which is under construction at a site 3 km (1.8 miles) inland of Saldanha Bay. It is a 50-50 joint venture between Iscor Ltd. and Industrial Development Corp. (IDC). Plans call for the construction of a hot coil production plant with an annual production capacity of 1.2 Mt, a Midrex Process direct reduced iron (DRI) plant with an annual production capacity of 800,000 tons, a Corex Process plant with an annual production capacity of 650,000 tons, and a new unloading berth for imported pellets. This project is scheduled for completion by the end of 1998. The DRI plant is to receive 1.2 Mt/yr of iron ore, and the Corex plant should receive 1 Mt/yr. The feedstock for the DRI plant will consist of 400,000 t/yr of pellets from Brazil with the balance being lump ore from Sishen. Sishen is to supply 2.0 Mt/yr of lump ore (Tex Report Co. Ltd., 1998).

Elsewhere, Iscor entered into an agreement with Hancock Prospecting Pty. Ltd. to perform a feasibility study on the Hope Downs iron ore deposits in the Pilbara region of Western Australia. Hancock, which holds the exploration and development rights to the Hope Downs tenements is a Western Australian-based company which holds numerous iron ore tenements elsewhere in Western Australia and receives royalties from current major iron ore producers in the State. Iscor would retain a participation interest of about 40% in the project and be the manager. The Hope Downs deposits contain a Marra-Mamba type ore with a reported resource of more than 800 Mt at an average iron content of 62%. Should the project proceed, the mine would probably have a 30-year life span, with production starting at about 6 Mt/yr in 2002 and increasing to a peak production level of 25 Mt/yr in 2008. Rail and port infrastructure options include a new rail line to one of the existing iron ore ports at Cape Lambert or Port Hedland, or a negotiated arrangement whereby the current producers will share existing rail and port infrastructure with Hope Downs. Legal mechanisms are in place in Australia to ensure access of third parties to existing Pilbara railway lines, which are owned and operated by other mining companies. The specific markets which may be targeted by Hope Downs are China, Japan, Korea, and Taiwan with a further percentage to Europe (Engineering & Mining Journal, 1998; Iscor Ltd., 1997; Iscor Ltd., 1998; Mining Journal, London, 1998a, b).

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TABLE 1
U.S. PRODUCTION AND SHIPMENTS OF IRON ORE, BY DISTRICTS 1/
(Exclusive of ore containing 5% or more manganese)

(Thousand metric tons)

Period	Lake Superior		Other U.S.		Total 2/	
	Monthly	Year to date	Monthly	Year to date	Monthly	Year to date
Production:						
1997:						
September	5,511	46,201	25	211	5,536	46,413
October	5,705	51,906	31	242	5,736	52,149
November	5,289	57,195	26	268	5,316	57,464
December	5,285	62,480	W	W	5,285	62,480
1998:						
January	5,000	5,000	W	W	5,000	5,000
February	4,496	9,496	W	W	4,496	9,496
March	4,736	14,232	W	W	4,736	14,232
April	4,900	19,132	W	W	4,900	19,132
May	5,506	24,637	W	W	5,506	24,637
June	5,636	30,273	W	W	5,636	30,273
July	5,433	35,706	W	W	5,433	35,706
August	5,839	41,545	W	W	5,839	41,545
September	5,384	46,942	W	W	5,384	46,942
October	5,279	52,208	W	W	5,279	52,208
Shipments:						
1997:						
September	6,351	43,815	27	208	6,378	44,024
October	6,057	49,872	32	240	6,089	50,113
November	6,189	56,061	27	267	6,215	56,329
December	6,408	62,469	W	W	6,408	62,469
1998:						
January	2,822	2,822	W	W	2,822	2,822
February	900	3,722	W	W	900	3,722
March	3,053	6,775	W	W	3,053	6,775
April	6,401	13,176	W	W	6,401	13,176
May	6,508	19,683	W	W	6,508	19,683
June	6,302	25,986	W	W	6,302	25,986
July	6,392	32,378	W	W	6,392	32,378
August	6,297	38,674	W	W	6,297	38,674
September	5,613	44,288	W	W	5,613	44,288
October	5,626	49,913	W	W	5,626	49,913

W Withheld to avoid disclosing company proprietary data.
1/ Excludes byproduct ore.
2/ Data may not add to totals shown because of independent rounding.

TABLE 2
U.S. PRODUCTION, SHIPMENTS AND STOCKS OF IRON ORE IN OCTOBER 1/
(Exclusive of ore containing 5% or more manganese)

(Thousand metric tons)

District	Production		Shipments 2/		Stocks 3/	
	1998	1997	1998	1997	1998	1997
Lake Superior:						
Michigan	1,365	1,466	1,282	1,210	3,359	2,503
Minnesota	3,915	4,240	4,343	4,847	3,678	4,184
Other U.S.	--	31	--	32	--	107
Total 4/	5,279	5,736	5,626	6,089	7,037	6,795

W Withheld to avoid disclosing company proprietary data.
1/ Excludes byproduct ore.
2/ Includes rail and vessel.
3/ Includes mines, plants, and loading docks.
4/ Data may not add to totals shown because of independent rounding.

TABLE 3
CANADA: SHIPMENTS OF IRON ORE

(Thousand dry metric tons)

Period	Newfoundland	Quebec	Ontario	British Columbia	Total 1/
1997:					
September	2,553	1,229	54	10	3,846
October	1,783	1,692	112	8	3,597
November	2,194	1,255	112	7	3,567
December	1,941	1,078	118	9	3,146
Year total	21,848	13,914	799	102	36,663
1998:					
January	1,400	989	111	8	2,509
February	1,036	1,090	112	9	2,247
March	727	806	108	7	1,648
April	2,221	1,054	100	10	3,386
May	2,327	1,585	102	12	4,026
June	2,734	932	102	8	3,777
July	2,562	922	--	6	3,490
August	2,299	946	--	8	3,253
September	1,709	1,187	--	11	2,907

1/ Data may not add to totals shown because of independent rounding.

Source: Natural Resources Canada.

TABLE 4
CONSUMPTION AND STOCKS OF IRON ORE AND AGGLOMERATES AND
BLAST FURNACE PRODUCTION OF HOT METAL AT U.S. IRON AND STEEL PLANTS

(Thousand metric tons)

	Consumption of ores and agglomerates			
	September		January-September	
Consumption by source	1998	1997	1998	1997
United States ores	4,676	5,074	44,225	43,063
Canadian ores	530	563	5,038	5,253
Foreign ores	423	466	4,444	4,764
Total 1/	5,629	6,103 r/	53,707	53,080 r/
Consumption by process				
Blast furnaces	5,167	5,575	48,792	47,953
Steel furnaces	17	6	78	69
Agglomerating plants 2/	444	521	4,808	4,999
Miscellaneous 3/	1	--	29	60
Total 1/	5,629	6,103 r/	53,707	53,080 r/

	Stocks of ores and agglomerates	
	September 30	
Storage point	1998	1997
Furnace yards	19,517	17,567
Receiving/transfer docks	3,306	2,847
Total consumer 1/	22,823	20,414

	Blast furnace production of hot metal			
	September		January-September	
	1998	1997	1998	1997
Hot metal and pig iron produced in blast furnaces	3,783	4,178 r/	37,190	36,686
No. of blast furnaces operating on the last day of the month	38	38	XX	XX

r/ Revised. XX Not applicable.
1/ Data may not add to totals shown because of independent rounding.
2/ Iron ore and iron ore concentrates consumed in agglomerating plants not located at the mine site.
3/ Sold to nonreporting companies or used for purposes not listed.

Sources: American Iron Ore Association (consumption of iron ore) and American Iron and Steel Institute (production of hot metal and pig iron).

TABLE 5
U.S. EXPORTS OF IRON ORE AND AGGLOMERATES, BY COUNTRY
OF DESTINATION AND TYPE

(Thousand metric tons)

Country of destination and type	1998				
	1st quarter	2nd quarter	July	August	September
Canada	897	1,792	522	512	447
Mexico	(1/)	(1/)	(1/)	(1/)	(1/)
Other	1	6	1	1	1
Total 2/	898	1,799	523	514	447
Pellets	892	1,763	516	506	428
Other	7	36	7	7	19
Total 2/	898	1,799	523	514	447

1/ Less than 1/2 unit.
2/ Data may not add to totals shown because of independent rounding.

Source: Bureau of the Census.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF IRON ORE AND AGGLOMERATES,
BY COUNTRY AND TYPE
(Exclusive of ore containing 20% or more manganese)

Country of origin and type of product	1998					1997
	September		January-September			January-September
	Thousand metric tons	Value 1/ (thousand dollars)	Thousand metric tons	Value 1/ (thousand dollars)	Value 1/ (dollars per ton)	Thousand metric tons
Australia	83	734	488	3,996	8.19	545
Brazil	535	12,758	4,701	131,320	27.93	3,934
Canada	1,076	35,216	6,671	227,094	34.04	6,802
Chile	--	--	48	1,232	26	195
China	(2/)	9	(2/)	9	4,500	40
Finland	--	--	10	484	48.40	8
Indonesia	--	--	--	--	--	(2/)
Japan	--	--	55	1,916	34.84	--
Madagascar	--	--	(2/)	2	11.04	--
Mexico	--	--	8	146	18.25	13
Norway	--	--	97	3,761	38.77	92
Peru	31	470	126	1,720	13.65	183
South Africa	--	--	--	--	--	13
Spain	--	--	21	464	22	4
Sweden	109	4,146	276	10,543	38.20	53
Venezuela	110	4,333	897	40,294	44.92	1,515
Zaire	--	--	--	--	--	(2/)
Total 3/	1,946	57,664	13,399	422,979	31.57 4/	13,398
Concentrates	208	3,252	785	14,305	18.22	1,048
Coarse ores	5	293	255	8,457	33.16	1,098
Fine ores	376	6,611	2,420	43,584	18.01	2,324
Pellets	1,208	44,098	8,984	323,570	36.02	7,988
Briquettes	--	--	217	15,197	70.03	--
Other agglomerates	149	3,402	731	17,494	23.93	933
Roasted pyrites	(2/)	9	7	372	53.14	8
Total 3/	1,946	57,664	13,399	422,979	31.57 4/	13,398

1/ Customs value. Excludes international freight, insurance, and other c.i.f. charges.
2/ Less than 1/2 unit.
3/ Data may not add to totals shown because of independent rounding.
4/ Weighted average calculated by dividing total value by total tonnage.

Source: Bureau of the Census.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF IRON ORE AND AGGLOMERATES IN SEPTEMBER 1998
(Exclusive of ore containing 20% or more manganese)

(Thousand metric tons)

	Type of product						
Country of origin	Concentrates	Coarse ores	Fine ores	Pellets	Briquettes and other agglomerates	Roasted pyrites	Total 1/
Austraila	22	--	61	--	--	--	83
Brazil	52	--	306	133	45	--	535
Canada	134	5	--	864	73	--	1,076
China	--	--	--	--	--	(2/)	(2/)
Peru	--	--	--	--	31	--	31
Sweden	--	--	9	101	--	--	109
Venezuela	--	--	--	110	--	--	110
Total 1/	208	5	376	1,208	149	(2/)	1,946

1/ Data may not add to totals shown because of independent rounding.
2/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF PELLETS, BY COUNTRY

	1998					1997
	September		January-September			January-September
Country of origin	Thousand metric tons	Value 1/ (thousand dollars)	Thousand metric tons	Value 1/ (thousand dollars)	Value 1/ (dollars per ton)	Thousand metric tons
Brazil	133	4,363	2,357	82,623	35.05	1,319
Canada	864	31,398	5,917	213,476	36.08	6,024
Japan	--	--	(2/)	3	78.77	--
Norway	--	--	97	3,761	38.77	92
Peru	--	--	7	99	14.14	--
Sweden	101	4,004	197	7,765	39.42	2
Venezuela	110	4,333	409	15,843	38.74	552
Total 3/	1,208	44,098	8,984	323,570	36.02 4/	7,988

1/ Customs value. Excludes international freight, insurance, and other c.i.f. charges.
2/ Less than 1/2 unit.
3/ Data may not add to totals shown because of independent rounding.
4/ Weighted average calculated by dividing total value by total tonnage.

Source: Bureau of the Census.

TABLE 9
U.S. IMPORTS FOR CONSUMPTION OF IRON ORE AND AGGLOMERATES, BY CUSTOMS DISTRICT
(Exclusive of ore containing 20% or more manganese)

(Thousand metric tons)

Customs district	September 1998	January-September 1998	January-September 1997
Baltimore, MD (13)	519	3,276	3,349
Buffalo, NY (09)	9	22	1
Charleston, SC (16)	81	532	560
Chicago, IL (39)	179	1,360	1,929
Cleveland, OH (41)	194	750	475
Detroit, MI (38)	261	1,513	1,443
Houston - Galveston, TX (53)	75	124	67
Laredo, TX (23)	--	13	--
Los Angeles, CA (27)	(1/)	16	(1/)
Miami, FL (52)	--	(1/)	--
Mobile, AL (19)	522	3,492	3,210
New Orleans, LA (20)	105	2,135	989
New York City (10)	--	--	1
Nogales, AZ (26)	--	8	13
Ogdensburg, NY (07)	--	(1/)	(1/)
Philadelphia, PA (11)	--	158	1,360
San Francisco, CA (28)	--	(1/)	(1/)
Savannah, GA (17)	--	--	(1/)
Total 2/	1,946	13,399	13,398

1/ Less than 1/2 unit.
2/ Data may not add to totals shown because of independent rounding.

Source: Bureau of the Census.

TABLE 10
U.S. IMPORTS FOR CONSUMPTION OF PELLETS, BY CUSTOMS DISTRICT

(Thousand metric tons)

Customs district	September 1998	January-September 1998	January-September 1997
Baltimore, MD (13)	227	1,303	1,299
Buffalo, NY (09)	--	--	1
Charleston, SC (16)	37	315	317
Chicago, IL (39)	26	738	933
Cleveland, OH (41)	134	613	343
Detroit, MI (38)	261	1,513	1,443
Houston - Galveston, TX (53)	--	49	67
Laredo, TX (23)	--	13	--
Mobile, AL (19)	522	3,191	2,516
New Orleans, LA (20)	--	1,156	280
New York City	--	--	1
Philadelphia, PA (11)	--	94	789
San Francisco, CA (28)	--	(1/)	--
Total 2/	1,208	8,984	7,988

1/ Less than 1/2 unit.
2/ Data may not add to totals shown because of independent rounding.

Source: Bureau of the Census.