APPENDIX D

LISTINGS OF DETAILED PROCESS SPREADSHEETS

D-1: 100% DRI CHARGED TO EAF – 1.0% CARBON

D-2: 100% DRI CHARGED TO EAF – 2.5% CARBON

D-3: 30% DRI CHARGED TO EAF – 1.0% CARBON

D-4: 100% SCRAP CHARGED TO EAF

APPENDIX D-1

100% DRI CHARGED TO EAF - 1.0% CARBON

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

BASIS: 7,940 HRS/YR CONCENTRATOR/PELLET/DRI OPERATION
8,000 HRS/YR EAF/LMF/CASTING OPERATION

184.5	T/HR ORE1 CONC. NET FEED	68.559%	IRON UNITS	IN CONC.		TARGET 68.560%
0.0	T/HR ORE2	0.000%	IRON UNITS			
0.0	T/HR ORE3	0.000%	IRON UNITS			
184.5	T/HR NET DRI ORE FEED	68.559%	IRON UNITS		89.36%	AS FE304
122.1	T/HR SLAB PRODUCED	8,000	HRS/YR BASIS		10.64%	AS FE2O3
				TARGET		BALANCE
1.089	DRI PROD.	1.636	ORE/P TO DRI	79.932%	Fe RECOV	80.763%
0.977	SLAB PROD.	1.114	DRI TO SLAB	60.000%	Wt.% RECOV	58.900%

TOTAL PLANT PRODUCTION (DRY BASIS):

6.294	MM TONNES/YEAR AS-MINED ROCK
2.488	MM TONNES/YEAR NET ORE TO CONCENTRATOR
1.465	MM TONNES/YEAR NET CONCENTRATE
0.000	MM TONNES/YEAR LUMP ORE3
1.940	MM TONNES/YEAR GREEN BALL PELLET (+6mm)
1.968	MM TONNES/YEAR TOTAL INDURATED PELLET
1.836	MM TONNES/YEAR NET INDURATED PELLET (+6mm)
1.781	MM TONNES/YEAR FEED TO DRI FCE.
1.089	MM TONNES/YEAR DRI
0.977	MM TONNES/YEAR NET SLAB PRODUCT (BALANCE)
0.000	MM TONNES/YEAR HOT BAND SLAB
0.977	MM TONNES/YEAR NET SLAB PRODUCT
1.000	MM TONNES/YEAR LIQUID STEEL (TARGET)
0.977	MM TONNES/YEAR NET SLAB PRODUCT (TARGET)

CONCENTRATOR

60.474%	WASTE ROCK - % OF MINED
3.000%	AS-MINED ROCK MOISTURE - %
30.000%	AS-MINED ROCK IRON UNITS - WT.% IRON
50.000%	ORE ROCK IRON UNITS - WT.% IRON
70.0%	GRIZZLY SCREEN O/S - % OF FEED
200.0%	CIRCULATING LOAD - +10 mm TO TERTIARY (% FEED)
0.0%	PERCENT FEED TO SECONDARY 2 (%)
0.0%	PERCENT FEED TO TERTIARY 4 (%)
300.0%	BALL MILL CIRCULATING LOAD (% OF FEED)
65.0%	BALL MILL PERCENT SOLIDS (% OF FEED)
35.0%	B.M. CYCLONE O/F PERCENT SOLIDS (%)
4.60%	GROUND ORE LOSSES TO SLIMES - WT.%
5.00%	DESLIME CYCLONE O/F PERCENT SOLIDS (%)
68.21%	STG.1 MAG. CONC. RECOVERY - WT.% OF FEED
86.39%	STG. 1 IRON UNIT RECOVERY - WT.% OF IRON UNITS
95.30%	STG. 2 MAG. CONC. WT. RECOVERY - WT.% OF FEED
98.50%	STG. 2 MAG. CONC. IRON UNIT RECOV. - WT.% OF IU
98.60%	STG. 3 MAG. CONC. RECOV. - WT.% OF FEED
99.50%	STG. 3 MAG. CONC. IRON UNIT RECOV. - WT.% OF IU
200.00%	REGRIND MILL CIRCULATING LOAD (% OF FEED)
65.00%	REGRIND MILL % SOLIDS (WT.%)
99.00%	S-FLOTATION IRON CONC - WT.% OF FEED
99.50%	S-FLOTATION IRON UNIT RECOV. - WT.% OF IU
97.30%	GAN. REJECT. MAG. SEP. - WT.% OF FEED
98.57%	GAN. REJECT. MAG. SEP. - WT.% OF IU

CONCENTRATOR DEWATERING

65.0%	WT.% SOLIDS IN CONC. THICK. U/F
35.0%	WT.% SOLIDS IN TAILS. THICK. U/F
0.0%	FEED DIVER. TO THICK. - % OF FEED
10.0%	FILTER FEED O/F - % OF FEED

DRI PLANT

3.0%	PERCENT OF PELLET FINES - WT.% PEL.
10.0%	PERCENT OF LUMP FINES - WT.% LUMP
4.0%	PERCENT DUST - WT.% OF OXIDE FEED
3.0%	PERCENT -6 mm DRI FINES - WT.% DRI
0.0%	PERCENT REMET CHARGED - WT.% OF FD
0.22%	PERC. LIME FOR COATING - WT.% OF FD
9.33%	SOLIDS IN OFF-GASS - WT.% OF DRI FD
1.69%	SOLIDS IN FCE GAS - WT.% OF DRI FD
28.83%	COARSE SOL. IN CLASS - % OF CLASS FD
0.57%	SOLIDS IN SILO DUST - % OF DRI PROD.
0.45%	SOLIDS IN OXIDE SCRN DUST - %DRI FD
1.38%	SOLIDS IN DRI SCRN DUST - %DRI PROD
93.00%	METALLIZATION - WT.% Fet IN DRI

PELLET PLANT

6.7%	PERCENT DUST/FINES - WT.% OF G.B.
2.0%	PERCENT U/S GREEN BALL PELLETS
2.0%	PERCENT O/S GREEN BALL PELLETS
0.0%	PERCENT U/S INDURATED PELLETS
0.0%	PERCENT O/S INDURATED PELLETS
25.0%	PERCENT O/S P.P. DUST - % DUST/FINES
0.0%	COKE TO PELLET - % OF FEED
0.6%	BINDER TO PELLET - % OF FEED
2.0%	DOLOMITE TO PELLET - % OF FEED
0.0%	LIMESTONE TO PELLET - % OF FEED
0.0%	HYDRATED LIME TO PELLET - % OF FEED
0.0%	EXCESS PELLETS TO SALES - % OF TOTAL

4.5%	L.O.I.
1.014	RATIO INDUR./G.B. PELLET

EAF/LMF/CASTING

2.0%	EAF DUST - WT. % OF SLAB
4.0%	DRI TO EAF INJ. - WT.% DRI
1.1%	DOLOMITE ADDITION
0.00%	SILICA FLUX - % DRI FD
0.65%	MISC. ADDIT. - % DRI FD
0.83%	C CHARGED - % DRI FD
0.35%	ELECTRODES - % DRI FD
3.87%	PUL. LIME EAF - % DRI FD
1.34%	REFRACTORIES - % DRI FD
14.34%	EAF SLAG - % DRI FD
2.26%	LADLE SCRAP - % M. STL
0.60%	TUND. SCRAP - % M. STL
99.00%	YIELD TO SLAB - % MS
98.00%	YIELD TO T.SLAB - % MS
98.00%	YIELD HOT BAND - % TS
1.74%	CROP ENDS - % M. STL
4.60%	TOTAL REVERT - %M. STL
1.56%	PURC. SCRAP - % M. STL.
0.50%	PUL. LIME LMF - %M. STL
0.04%	SLG TO LMF - % M. STL
0.64%	SLG FR. LMF - %MS
0.060	ARGON TO LMF - NM3/T MS
0.50%	SLAB SCALE - %MS
0.06%	MOLD POWDER - % M. STL.
0.03%	TUND. POWDER - % M. STL.
100.00%	SLAB PROD. - % OF PROD.
0.27%	SLAG C INJ. - WT% M. STL
25.60%	%Fe IN EAF SLAG

RED = ASSUMPTION INPUT (DATA OR EXPERIENCE) BLUE = DERIVED VARIABLE

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: ORIRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
1001	AS-MINED ROCK	97.0%	6.294	0.195	6.488	353.4%	30.00%	1.888
1002	WASTE ROCK	97.0%	3.806	0.118	3.924	213.7%	16.93%	0.644
1	IRON ORE TO CONCENTRATOR (CRUSHING)	97.0%	2.488	0.077	2.564	139.7%	50.00%	1.244
2	PRODUCT FROM PRIMARY CRUSHER (80% -130 mm)	97.0%	2.488	0.077	2.564	139.7%	50.00%	1.244
3	FEED TO GRIZZLY (Secondary 1)	97.0%	2.488	0.077	2.564	139.7%	50.00%	1.244
3 a	FEED TO GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
4	OS FROM GRIZZLY (Secondary 1)	97.0%	1.741	0.054	1.795	97.8%	50.00%	0.871
4 a	OS FROM GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
5	US FROM GRIZZLY (Secondary 1)	97.0%	0.746	0.023	0.769	41.9%	50.00%	0.373
5 a	US FROM GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
6	US FROM SECONDARY 1 (80% -37 mm)	97.0%	1.741	0.054	1.795	97.8%	50.00%	0.871
6 a	US FROM SECONDARY 2 (80% -37 mm)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
7	TOTAL FEED TO TERTIARY CRUSHERS (+10 mm)	97.0%	4.975	0.154	5.129	279.4%	50.00%	2.488
7 a	US FROM TERTIARY 1 (80% -10 mm)	97.0%	1.658	0.051	1.710	93.1%	50.00%	0.829
7 b	US FROM TERTIARY 2 (80% -10 mm)	97.0%	1.658	0.051	1.710	93.1%	50.00%	0.829
7 c	US FROM TERTIARY 3 (80% -10 mm)	97.0%	1.658	0.051	1.710	93.1%	50.00%	0.829
7 d	US FROM TERTIARY 4 (80% -10 mm)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
8	TOTAL FEED TO TERTIARY SCREENS	97.0%	7.463	0.231	7.693	419.1%	50.00%	3.731
9	UNDERSIZE FROM TERTIARY SCREENS (-10 mm)	97.0%	2.488	0.077	2.564	139.7%	50.00%	1.244
10	TOTAL FEED TO BALL MILLS (-10 mm)	97.0%	2.488	0.077	2.564	139.7%	50.00%	1.244

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

IRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
10 a	FEED TO BALL MILLS 1&2 (-10 mm)	97.0%	1.244	0.038	1.282	69.8%	50.00%	0.622
10 b	FEED TO BALL MILLS 3&4 (-10 mm)	97.0%	1.244	0.038	1.282	69.8%	50.00%	0.622
11	TOTAL FEED TO BALL MILLS (-10 mm)	97.0%	1.244	0.038	1.282	69.8%	50.00%	0.622
11 a	FEED TO BALL MILL 1 (-10 mm)	97.0%	0.622	0.019	0.641	34.9%	50.00%	0.311
11 b	FEED TO BALL MILL 2 (-10 mm)	97.0%	0.622	0.019	0.641	34.9%	50.00%	0.311
11 c	FEED TO BALL MILL 3 (-10 mm)	97.0%	0.622	0.019	0.641	34.9%	50.00%	0.311
11 d	FEED TO BALL MILL 4 (-10 mm)	97.0%	0.622	0.019	0.641	34.9%	50.00%	0.311
12	TOTAL FEED TO BALL MILL CYCLONES	65.0%	6.219	3.349	9.568	349.2%	50.00%	3.109
13	TOTAL B.M. CYCLONE UNDERFLOW	21.4%	3.731	13.679	17.410	209.5%	50.00%	1.866
14	TOTAL B.M. MAKEUP WATER	0.0%	0.000	14.950	14.950			
15	TOTAL B.M. CYCLONE OVERFLOW	35.0%	2.488	4.620	7.107	139.7%	50.00%	1.244
21	ORE SLIMES TO TAILINGS	5.0%	0.114	2.174	2.289	6.4%	29.80%	0.034
22	DE-SLIMED ORE TO MAG. SEP.	49.3%	2.373	2.446	4.819	133.3%	50.97%	1.210
23	MAG. SEP. 1 DILUTION WATER	0.0%	0.000	31.600	31.600			
24	NET FEED TO MAG. SEP. 1	6.5%	2.373	34.046	36.419	133.3%	50.97%	1.210
25	MAG. SEP 1 TAILS	11.9%	0.754	5.585	6.339	42.4%	21.70%	0.164
26	MAG. SEP. 1 CONC.	5.4%	1.619	28.461	30.080	90.9%	64.62%	1.046
27	MAG. SEP. 2 DILUTION WATER	0.0%	0.000	14.300	14.300			
28	NET FEED TO MAG. SEP. 2	3.6%	1.619	42.761	44.380	90.9%	64.62%	1.046
29	MAG. SEP 2 TAILS	1.5%	0.076	4.996	5.072	4.3%	21.94%	0.017
30	MAG. SEP. 2 CONC.	3.9%	1.543	37.765	39.308	86.6%	66.72%	1.029

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

IRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
31	MAG. SEP. 3 DILUTION WATER	0.0%	0.000	13.900	13.900			
32	NET FEED TO MAG. SEP. 3	2.9%	1.543	51.665	53.208	86.6%	66.72%	1.029
33	MAG. SEP 3 TAILS	1.5%	0.022	1.418	1.440	1.2%	23.83%	0.005
34	MAG. SEP. 3 CONC.	2.9%	1.521	50.247	51.768	85.4%	67.33%	1.024
35	REGRIND MILL DISCHARGE	65.0%	3.042	1.638	4.680	170.8%	0.00%	0.000
36	NET FEED TO REGRIND MILL CYCLONE	8.1%	4.563	51.885	56.448	256.3%	67.33%	3.073
37	REGRIND MILL CYCLONE O/F PRODUCT TO FLOTATION	2.9%	1.521	50.247	51.768	85.4%	67.33%	1.024
38	REGRIND MILL CYCLONE U/F TO MILL	65.0%	3.042	1.638	4.680	170.8%	67.33%	2.048
39	REGRIND MILL DILUTION WATER	0.0%	0.000	0.000	0.000			
40	FLOTATION DILUTION WATER	0.0%	0.000	5.100	5.100			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: ORIRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
41	FLOTATION CHEMICALS	0.0%	0.000	0.050	0.050			
42	NET FLOTATION FEED	2.7%	1.521	55.397	56.918	85.4%	67.33%	1.024
43	FLOAT TAILS - Fe CONC. TO MAG. IV	2.6%	1.506	55.355	56.861	84.6%	67.67%	1.019
44	SULFUR FLOAT REJECTS TO TAILS	27.0%	0.015	0.041	0.056	0.9%	33.67%	0.005
45	MAG. SEP. 4 CONC.	2.7%	1.465	52.682	54.147	82.3%	68.56%	1.005
46	MAG. SEP. 4 GANGUE REJECT TO TAILS	1.5%	0.041	2.674	2.715	2.3%	35.69%	0.015
47	CONCENTRATE TO PIPELINE FEED	65.0%	1.465	0.789	2.254	82.3%	68.56%	1.005
48	EXCESS WATER FROM CONC. THICK. TO P.W. POND	0.0%	0.000	51.893	51.893			
49	TOTAL REJECTS TO TAILS	5.7%	1.022	16.888	17.911	57.4%	23.40%	0.239
50	DEWATERED TAILINGS TO DISPOSAL	35.0%	1.022	1.899	2.921	57.4%	23.40%	0.239
51	TAILS THICKENER DECANT TO P.W. POND	0.0%	0.000	14.990	14.990			
52	EXCESS WATER FROM TAILS POND	0.0%	0.000	1.388	1.388			
53	FRESH WATER MAKEUP TO P.W. POND	0.0%	0.000	5.232	5.232			
54	EVAPORATION FROM P.W. POND	0.0%	0.000	3.675	3.675			
	TOTAL INPUTS TO P.W. POND	0.0%	0.000	73.502	73.502			
55	TOTAL CONCENTRATOR WATER INPUTS	0.0%	0.000	79.900	79.900			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: ORPIPELINE & ORE RECEIVING (PFD-003)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
43	CONCENTRATE SLURRY FROM PIPELINE	65.0%	1.465	0.789	2.254	82.3%	68.56%	1.005
101	CONCENTRATE FEED TO DEWATERING	65.0%	1.465	0.789	2.254	82.3%	68.56%	1.005
102	NET FILTER FEED	60.0%	2.098	1.399	3.497	117.8%	70.54%	1.480
103	FEED SLURRY DIVERSION TO THICKENERS	65.0%	0.000	0.000	0.000	0.0%	68.56%	0.000
104	FILTER CAKE	92.0%	1.888	0.164	2.053	106.0%	70.54%	1.332
105	FILTRATE	0.0%	0.000	1.095	1.095			
106	FILTER O/F	60.0%	0.210	0.140	0.350	11.8%	70.54%	0.148
107	LAUNDER WASH-DOWN WATER	0.0%	0.000	0.699	0.699			
108	NET FILTER O/F RETURN	20.0%	0.210	0.839	1.049	11.8%	70.54%	0.148
109	THICKENER FEED	50.6%	2.098	2.052	4.150	117.8%	70.54%	1.480
110	THICKENER DECANT	0.0%	0.000	0.653	0.653			
111	THICKENER U/F	60.0%	2.098	1.399	3.497	117.8%	70.54%	1.480
112	EXCESS WATER TO PROCESS WATER	0.0%	0.000	1.747	1.747			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: ORSTOCKPILE, PELLET PLANT SLURRY/FINES HANDLING (BFD-004)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
201	RECYCLE EAF DUST SLURRY	15.0%	0.020	0.112	0.132	1.1%	48.50%	0.010
202	RECYCLE DRI DUST SLURRY	15.0%	0.169	0.957	1.125	9.5%	87.47%	0.148
203	P.P. DUST/FINES SLURRY	15.0%	0.123	0.697	0.820	6.9%	67.81%	0.083
204	P.P. DUST SYSTEMS O.S.	80.0%	0.047	0.012	0.059	2.6%	67.81%	0.032
205	FEED TO P.P. THICKENER	18.5%	0.423	1.860	2.283	23.8%	77.42%	0.328
206	DECANT FROM P.P. THICKENER	0.0%	0.000	1.437	1.437			
207	U/F FROM P.P. THICKENER TO FEED THICK.	50.0%	0.423	0.423	0.847	23.8%	77.42%	0.328
208	DRI CLASSIFIER O/S	75.0%	0.057	0.019	0.075	3.2%	87.80%	0.050
209	-6 mm ORE/PELLET FINES	100.0%	0.055	0.000	0.055	3.1%	67.81%	0.037
210	INDURATED PELLET RECYCLE O/S & U/S	100.0%	0.000	0.000	0.000	0.0%	67.81%	0.000
211	TOTAL FEED TO MILLING	83.8%	0.159	0.031	0.189	8.9%	74.93%	0.119
212	MILL MAKE-UP WATER	0.0%	0.000	0.075	0.075	0.0%		
213	GROUND FINES SLURRY TO P.P. THICKENER	60.0%	0.159	0.106	0.265	8.9%	74.93%	0.119
232	INDURATED PELLETS TO STOCKPILE	100.0%	1.836	0.000	1.836	103.1%	67.81%	1.245
250	RECLAIMED PELLETS	100.0%	1.836	0.000	1.836	103.1%	67.81%	1.245
251	LUMP ORE3 TO STOCKPILE	97.0%	0.000	0.000	0.000	0.0%	0.00%	0.000
252	RECLAIMED LUMP ORE	97.0%	0.000	0.000	0.000	0.0%	0.00%	0.000
253	PELLET/LUMP ORE TO FEED SILOS	100.0%	1.836	0.000	1.836	103.1%	67.81%	1.245
254	EXCESS PELLETS TO SALES	0.0%	0.000	0.000	0.000	0.0%	67.81%	0.000

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: ORGREEN BALL PELLET PRODUCTION: (BFD-005)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
104	FILTER CAKE TO PELLET PLANT	92.0%	1.888	0.164	2.053	106.0%	70.54%	1.332
218	NET OXIDE FEED TO PELLETIZING	91.9%	1.969	0.173	2.142	110.6%	70.47%	1.388
219	PELLETIZING WATER	0.0%	0.000	0.027	0.027	0.0%		
220	COKE TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
221	BINDER TO PELLETIZING	100.0%	0.012	0.000	0.012	0.7%	11.60%	0.001
222	DOLOMITE TO PELLETIZING	100.0%	0.040	0.000	0.040	2.3%	1.61%	0.001
223	LIMESTONE TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
224	HYDRATED LIME TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
225	PELLET FEED MIXTURE	91.0%	2.021	0.200	2.221	113.5%	68.76%	1.390
226	DISC DRESSING MOISTURE	0.0%	0.000	0.012	0.012	0.0%		
227	GREEN BALL PELLETS	90.5%	2.021	0.212	2.233	113.5%	68.76%	1.390
228	COMBINED GREEN BALL O/S & U/S	90.5%	0.081	0.008	0.089	4.5%	68.76%	0.056
229	SIZED GREEN BALL PELLETS	90.5%	1.940	0.204	2.144	109.0%	68.76%	1.334

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: ORINDURATED PELLET PRODUCTION: (BFD-006)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
229	SIZED GREEN BALL PELLETS	90.5%	1.940	0.204	2.144	109.0%	68.76%	1.334
230	INDURATED PELLETS (GROSS)	100.0%	1.968	0.000	1.968	110.5%	67.81%	1.334
231	INDURATED PELLETS (NET)	100.0%	1.836	0.000	1.836	103.1%	67.81%	1.245
232	CRUSHED OVERSIZE PELLETS	100.0%	0.000	0.000	0.000	0.0%	67.81%	0.000
233	UNDERSIZE INDURATED PELLETS	100.0%	0.000	0.000	0.000	0.0%	67.81%	0.000
234	RECYCLED INDURATED PELLET DUST/FINES	100.0%	0.132	0.000	0.132	7.4%	67.81%	0.089
235	P.P. DUST SLURRY WATER	0.0%	0.000	0.697	0.697			
203	P.P. DUST SLURRY TO PELLET FEED	15.0%	0.123	0.697	0.820	6.9%	67.81%	0.089
210	INDURATED PELLET RECYCLE O/S & U/S	100.0%	0.000	0.000	0.000	0.0%	67.81%	0.000

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: ORDRI SYSTEMS, 1 OF 2 (PFD-007)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (T/HR)
253	RECLAIMED PELLETS/LUMP ORE	100.0%	1.8358	0.0000	1.8358	103.1%	67.81%	1.2448
209	-6 mm OXIDE TO PELLETIZING (ORE/PELLETS)	100.0%	0.0551	0.0000	0.0551	3.1%	67.81%	0.0373
299	REMET (OTHER) CHARGED TO SHAFT FCE.	100.0%	0.0000	0.0000	0.0000	0.0%	67.81%	0.0000
300	NET ORE/PELLETS, ETC. TO SHAFT FCE.	100.0%	1.7807	0.0000	1.7807	100.0%	67.81%	1.2075
301	COATING LIME	100.0%	0.0095	0.0000	0.0095	0.5%		
302	LIME COATING WATER	0.0%	0.0000	0.0284	0.0284	0.0%		
303	NET FURNACE FEED	98.4%	1.7902	0.0284	1.8186	100.5%	67.45%	1.2075
304	OFF-GASSES (INCL. DUST/WV)	24.5%	0.1661	0.5121	0.6783	9.3%	87.80%	0.1459
305	GAS QUENCH SCRUB WATER (MM TPY)	0.0%	0.0000	73.6071	73.6071	0.0%		
306	FURNACE DUST TO DUST SCRUBBERS	100.0%	0.0302	0.0000	0.0300	1.7%	87.80%	0.0264
307	FURNACE DUST SCRUB WATER	0.0%	0.0000	2.3448	2.3448	0.0%		
308	FCE DUST SLURRY TO CLASSIFIER	1.3%	0.0300	2.3448	2.3748	1.7%	87.80%	0.0264
309	GAS QUENCH SCRUBBER BLOWDOWN	6.6%	0.1661	2.3448	2.5109	9.3%	87.80%	0.1459
208	COARSE SOLIDS FROM CLASSIFIER	75.0%	0.0565	0.0188	0.0754	3.2%	87.80%	0.0496
310	DE-GRITTED FCE. SCRUB BLOW-DOWN	97.0%	0.1396	4.6707	4.8103	7.8%	87.80%	0.1226
311	PRODUCT SILO SCRUBBER BLOW-DOWN	0.4%	0.0062	1.6079	1.6140	0.3%	92.80%	0.0057
312	OXIDE SCREEN SCRUBBER BLOW-DOWN	100.0%	0.0080	1.6079	1.6159	0.5%	67.81%	0.0055
313	COMPRESSOR COOLING WATER	0.0%	0.0000	6.6994	6.6994	0.0%		
314	PRODUCT SCREEN SCRUBBER	0.6%	0.0150	2.3448	2.3598	0.8%	92.80%	0.0139
315	NET CLARIFIER FEED	0.2%	0.1688	91.0498	91.2186	9.5%	87.47%	0.1477

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: ORDRI SYSTEMS, 2 OF 2 (PFD-008)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
316	CLAR. DECANT TO COOLING SYSTEMS	0.0%	0.0000	90.093	90.093	0.0%		
317	DRI TO SCREENS	100.0%	1.0886	0.000	1.089	61.1%	92.80%	1.0102
318	DRI WITH FINES REMOVED	100.0%	1.0450	0.000	1.045	58.7%	92.80%	0.9698
319	DRI FROM SILOS	100.0%	1.0450	0.000	1.045	58.7%	92.80%	0.9698
320	EXCESS DRI TO SALES	100.0%	0.0000	0.000	0.000	0.0%	92.80%	0.0000
321	DRI TO EAF STORAGE HOPPERS	100.0%	1.0450	0.000	1.045	58.7%	92.80%	0.9698
322	GAS QUENCH O/F WATER TO CLARIFIER	0.0%	0.0000	74.119	74.119	0.0%		
323	INERT GAS (MM Nm3/YR)	0.0%	0.0000	43.000	43.000	0.0%		
324	DRI SCREEN FINES TO EAF INJECTION	100.0%	0.0435	0.000	0.044	2.4%	92.80%	0.0404

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: OREAF STEELMAKING/LMF (PFD-009) BASIS: 8,000 HRS/YR EAF/LMF/CASTING OPERATION

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	% OF SLAB OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
400	TOTAL DRI FEED TO EAF	100.0%	1.089	0.000	1.089	61.1%	92.80%	1.010
401	LUMP LIME FLUX TO EAF	100.0%	0.012	0.000	0.012	0.7%		
402	SILICA FLUX	100.0%	0.000	0.000	0.000	0.0%		
403	MISC. ADDITIVES (Al, FeMn, FeSi, etc.)	100.0%	0.007	0.000	0.007	1.8%	40.72%	0.013
404	STEEL CARBON (CHARGED+SLAG INJ.)	100.0%	0.012	0.000	0.012	3.0%		
405	EAF ELECTRODES	100.0%	0.004	0.000	0.004	0.5%		
406	TOTAL EAF COOLING WATER CIRC. (MM NM3/YR)	0.0%	0.000	70.627	70.627	0.0%		
407	REVERT SCRAP	100.0%	0.048	0.000	0.048	2.7%	99.70%	0.048
408	PURCHASED SCRAP	100.0%	0.016	0.000	0.016	0.9%	99.70%	0.016
409	NET SCRAP CHARGED	100.0%	0.065	0.000	0.065	3.6%	99.70%	0.065
410	TOTAL FLUX & ADDITIVES CHARGED	100.0%	0.031	0.000	0.031	1.8%	41.32%	0.013
411	REFRACTORIES CONSUMMED	100.0%	0.015	0.000	0.015	0.8%		
412	PROCESS/COOLING WATER OUT OF EAF (MM NM3/YR)	0.0%	0.000	70.627	70.627	0.0%		
413	EAF SLAG (LIQUID)	0.0%	0.000	0.156	0.156	0.0%	25.60%	0.040
414	EAF DUST TO EAF DUST COLLECTION	100.0%	0.020	0.000	0.020	1.1%	48.50%	0.010
415	OXYGEN GAS TO FURNACE (MM Nm3/YR)	0.0%	0.000	11.000	11.000	0.0%		
416	LIQUID EAF STEEL TO LADLE REFINING	0.0%	0.000	1.054	1.054	0.0%	99.70%	1.051
417	PULVERIZED LIME TO LADLE REF. FCE.	100.0%	0.005	0.000	0.005	0.3%		
418	SLAG/WIRE DESULFURIZER TO LRF	100.0%	0.0004	0.0000	0.0034	0.2%		
419	ARGON GAS TO LRF (MM Nm3/YR)	0.0%	0.000	0.063	0.063	0.0%		

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE)

Revision A: OREAF STLMAKING/LMF (PFD-009), CASTING (PFD-010) BASIS: 0 (MM T/YR)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	% OF SLAB OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
420	SLAG & LOSSES FROM LRF	0.0%	0.000	0.007	0.007	0.0%	31.80%	0.002
421	REFINED STEEL TO CASTING	0.0%	0.000	1.052	1.052	0.0%	99.70%	1.049
422	PULVERIZED LIME FLUX TO EAF	100.0%	0.042	0.000	0.012	0.7%		
423	WATER FOR EAF DUST TRANSPORT	0.0%	0.000	0.112	0.112	0.0%		
424	PROC. COOLING WATER LMF	0.0%	0.000	14.125	14.125	0.0%		
425	TOTAL SLAG OUTPUT (AS SOLID)	100.0%	0.156	0.000	0.156	8.8%	26.97%	0.042
501	SLAB SCALE	0.0%	0.005	0.000	0.005	0.3%	80.00%	0.004
502	LADLE SCRAP	0.0%	0.024	0.000	0.024	1.3%	99.70%	0.024
503	TUNDISH SCRAP	100.0%	0.006	0.000	0.006	0.4%	99.70%	0.006
504	CROP END SCRAP	0.0%	0.018	0.000	0.018	1.0%	99.70%	0.018
505	MOLD POWDER TO CASTING	100.0%	0.0006	0.000	0.001	4.8%		
506	TUNDISH POWDER TO CASTING	100.0%	0.0003	0.000	0.000	1.5%		
507	MOLD COOLING WATER (MM NM3/YR)	0.0%	0.000	29.206	29.206	0.0%		
508	CONTACT COOLING WATER (MM NM3/YR)	0.0%	0.161	9.600	9.761	9.1%		
509	NET STEEL TO CASTING	0.0%	0.000	0.999	0.999	0.0%	99.70%	0.996
510	TOTAL CAST SLAB PRODUCT	100.0%	0.977	0.000	0.977	54.9%	99.70%	0.974
511	THIN SLAB TO HOT BAND	#DIV/0!	0.000	0.000	0.000	0.0%	99.70%	0.000
512	SLABS TO SALES	100.0%	0.977	0.000	0.977	54.9%	99.70%	0.974
513	HOT BAND TO SALES	100.0%	0.000	0.000	0.000	0.0%	99.70%	0.000

APPENDIX D-2

100% DRI CHARGED TO EAF – 2.5% CARBON

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

BASIS: 7,940 HRS/YR CONCENTRATOR/PELLET/DRI OPERATION
8,000 HRS/YR EAF/LMF/CASTING OPERATION

184.8	T/HR ORE1 CONC. NET FEED	68.559%	IRON UNITS	IN CONC.		TARGET 68.560%
0.0	T/HR ORE2	0.000%	IRON UNITS			
0.0	T/HR ORE3	0.000%	IRON UNITS			
184.8	T/HR NET DRI ORE FEED	68.559%	IRON UNITS		89.36%	AS FE304
122.2	T/HR SLAB PRODUCED	8,000	HRS/YR BASIS		10.64%	AS FE2O3
				TARGET		BALANCE
1.107	DRI PROD.	1.611	ORE/P TO DRI	79.932%	Fe RECOV	80.763%
0.977	SLAB PROD.	1.132	DRI TO SLAB	60.000%	Wt.% RECOV	58.900%

TOTAL PLANT PRODUCTION (DRY BASIS):

6.301	MM TONNES/YEAR AS-MINED ROCK
2.491	MM TONNES/YEAR NET ORE TO CONCENTRATOR
1.467	MM TONNES/YEAR NET CONCENTRATE
0.000	MM TONNES/YEAR LUMP ORE3
1.943	MM TONNES/YEAR GREEN BALL PELLET (+6mm)
1.970	MM TONNES/YEAR TOTAL INDURATED PELLET
1.838	MM TONNES/YEAR NET INDURATED PELLET (+6mm)
1.783	MM TONNES/YEAR FEED TO DRI FCE.
1.107	MM TONNES/YEAR DRI
0.977	MM TONNES/YEAR NET SLAB PRODUCT (BALANCE)
0.000	MM TONNES/YEAR HOT BAND SLAB
0.977	MM TONNES/YEAR NET SLAB PRODUCT
1.000	MM TONNES/YEAR LIQUID STEEL (TARGET)
0.977	MM TONNES/YEAR NET SLAB PRODUCT (TARGET)

CONCENTRATOR

60.474%	WASTE ROCK - % OF MINED
3.000%	AS-MINED ROCK MOISTURE - %
30.000%	AS-MINED ROCK IRON UNITS - WT.% IRON
50.000%	ORE ROCK IRON UNITS - WT.% IRON
70.0%	GRIZZLY SCREEN O/S - % OF FEED
200.0%	CIRCULATING LOAD - +10 mm TO TERTIARY (% FEED)
0.0%	PERCENT FEED TO SECONDARY 2 (%)
0.0%	PERCENT FEED TO TERTIARY 4 (%)
300.0%	BALL MILL CIRCULATING LOAD (% OF FEED)
65.0%	BALL MILL PERCENT SOLIDS (% OF FEED)
35.0%	B.M. CYCLONE O/F PERCENT SOLIDS (%)
4.60%	GROUND ORE LOSSES TO SLIMES - WT.%
5.00%	DESLIME CYCLONE O/F PERCENT SOLIDS (%)
68.21%	STG.1 MAG. CONC. RECOVERY - WT.% OF FEED
86.39%	STG. 1 IRON UNIT RECOVERY - WT.% OF IRON UNITS
95.30%	STG. 2 MAG. CONC. WT. RECOVERY - WT.% OF FEED
98.50%	STG. 2 MAG. CONC. IRON UNIT RECOV. - WT.% OF IU
98.60%	STG. 3 MAG. CONC. RECOV. - WT.% OF FEED
99.50%	STG. 3 MAG. CONC. IRON UNIT RECOV. - WT.% OF IU
200.00%	REGRIND MILL CIRCULATING LOAD (% OF FEED)
65.00%	REGRIND MILL % SOLIDS (WT.%)
99.00%	S-FLOTATION IRON CONC - WT.% OF FEED
99.50%	S-FLOTATION IRON UNIT RECOV. - WT.% OF IU
97.30%	GAN. REJECT. MAG. SEP. - WT.% OF FEED
98.57%	GAN. REJECT. MAG. SEP. - WT.% OF IU

CONCENTRATOR DEWATERING

65.0%	WT.% SOLIDS IN CONC. THICK. U/F
35.0%	WT.% SOLIDS IN TAILS. THICK. U/F
0.0%	FEED DIVER. TO THICK. - % OF FEED
10.0%	FILTER FEED O/F - % OF FEED

DRI PLANT

3.0%	PERCENT OF PELLET FINES - WT.% PEL.
10.0%	PERCENT OF LUMP FINES - WT.% LUMP
4.0%	PERCENT DUST - WT.% OF OXIDE FEED
3.0%	PERCENT -6 mm DRI FINES - WT.% DRI
0.0%	PERCENT REMET CHARGED - WT.% OF FD
0.22%	PERC. LIME FOR COATING - WT.% OF FD
9.32%	SOLIDS IN OFF-GASS - WT.% OF DRI FD
1.68%	SOLIDS IN FCE GAS - WT.% OF DRI FD
28.83%	COARSE SOL. IN CLASS - % OF CLASS FD
0.56%	SOLIDS IN SILO DUST - % OF DRI PROD.
0.45%	SOLIDS IN OXIDE SCRN DUST - %DRI FD
1.36%	SOLIDS IN DRI SCRN DUST - %DRI PROD
91.59%	METALLIZATION - WT.% Fet IN DRI

PELLET PLANT

6.7%	PERCENT DUST/FINES - WT.% OF G.B.
2.0%	PERCENT U/S GREEN BALL PELLETS
2.0%	PERCENT O/S GREEN BALL PELLETS
0.0%	PERCENT U/S INDURATED PELLETS
0.0%	PERCENT O/S INDURATED PELLETS
25.0%	PERCENT O/S P.P. DUST - % DUST/FINES
0.0%	COKE TO PELLET - % OF FEED
0.6%	BINDER TO PELLET - % OF FEED
2.0%	DOLOMITE TO PELLET - % OF FEED
0.0%	LIMESTONE TO PELLET - % OF FEED
0.0%	HYDRATED LIME TO PELLET - % OF FEED
0.0%	EXCESS PELLETS TO SALES - % OF TOTAL

4.5%	L.O.I.
1.014	RATIO INDUR./G.B. PELLET

EAF/LMF/CASTING

2.0%	EAF DUST - WT. % OF SLAB
4.0%	DRI TO EAF INJ. - WT.% DRI
1.1%	DOLOMITE ADDITION
0.00%	SILICA FLUX - % DRI FD
0.65%	MISC. ADDIT. - % DRI FD
0.62%	C CHARGED - % DRI FD
0.40%	ELECTRODES - % DRI FD
3.87%	PUL. LIME EAF - % DRI FD
1.34%	REFRACTORIES - % DRI FD
14.34%	EAF SLAG - % DRI FD
2.26%	LADLE SCRAP - % M. STL
0.60%	TUND. SCRAP - % M. STL
99.00%	YIELD TO SLAB - % MS
98.00%	YIELD TO T.SLAB - % MS
98.00%	YIELD HOT BAND - % TS
1.74%	CROP ENDS - % M. STL
4.60%	TOTAL REVERT - %M. STL
1.56%	PURC. SCRAP - % M. STL.
0.50%	PUL. LIME LMF - %M. STL
0.04%	SLG TO LMF - % M. STL
0.64%	SLG FR. LMF - %MS
0.060	ARGON TO LMF - NM3/T MS
0.50%	SLAB SCALE - %MS
0.06%	MOLD POWDER - % M. STL.
0.03%	TUND. POWDER - % M. STL.
100.00%	SLAB PROD. - % OF PROD.
0.27%	SLAG C INJ. - WT% M. STL
25.60%	%Fe IN EAF SLAG

RED = ASSUMPTION INPUT (DATA OR EXPERIENCE) BLUE = DERIVED VARIABLE

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: ORIRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
1001	AS-MINED ROCK	97.0%	6.301	0.195	6.496	353.5%	30.00%	1.890
1002	WASTE ROCK	97.0%	3.811	0.118	3.929	213.8%	16.93%	0.645
1	IRON ORE TO CONCENTRATOR (CRUSHING)	97.0%	2.491	0.077	2.568	139.7%	50.00%	1.245
2	PRODUCT FROM PRIMARY CRUSHER (80% -130 mm)	97.0%	2.491	0.077	2.568	139.7%	50.00%	1.245
3	FEED TO GRIZZLY (Secondary 1)	97.0%	2.491	0.077	2.568	139.7%	50.00%	1.245
3 a	FEED TO GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
4	OS FROM GRIZZLY (Secondary 1)	97.0%	1.743	0.054	1.797	97.8%	50.00%	0.872
4 a	OS FROM GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
5	US FROM GRIZZLY (Secondary 1)	97.0%	0.747	0.023	0.770	41.9%	50.00%	0.374
5 a	US FROM GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
6	US FROM SECONDARY 1 (80% -37 mm)	97.0%	1.743	0.054	1.797	97.8%	50.00%	0.872
6 a	US FROM SECONDARY 2 (80% -37 mm)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
7	TOTAL FEED TO TERTIARY CRUSHERS (+10 mm)	97.0%	4.981	0.154	5.135	279.4%	50.00%	2.491
7 a	US FROM TERTIARY 1 (80% -10 mm)	97.0%	1.660	0.051	1.712	93.1%	50.00%	0.830
7 b	US FROM TERTIARY 2 (80% -10 mm)	97.0%	1.660	0.051	1.712	93.1%	50.00%	0.830
7 c	US FROM TERTIARY 3 (80% -10 mm)	97.0%	1.660	0.051	1.712	93.1%	50.00%	0.830
7 d	US FROM TERTIARY 4 (80% -10 mm)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
8	TOTAL FEED TO TERTIARY SCREENS	97.0%	7.472	0.231	7.703	419.2%	50.00%	3.736
9	UNDERSIZE FROM TERTIARY SCREENS (-10 mm)	97.0%	2.491	0.077	2.568	139.7%	50.00%	1.245
10	TOTAL FEED TO BALL MILLS (-10 mm)	97.0%	2.491	0.077	2.568	139.7%	50.00%	1.245

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

08-June-2000 IRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
10 a	FEED TO BALL MILLS 1&2 (-10 mm)	97.0%	1.245	0.039	1.284	69.9%	50.00%	0.623
10 b	FEED TO BALL MILLS 3&4 (-10 mm)	97.0%	1.245	0.039	1.284	69.9%	50.00%	0.623
11	TOTAL FEED TO BALL MILLS (-10 mm)	97.0%	1.245	0.039	1.284	69.9%	50.00%	0.623
11 a	FEED TO BALL MILL 1 (-10 mm)	97.0%	0.623	0.019	0.642	34.9%	50.00%	0.311
11 b	FEED TO BALL MILL 2 (-10 mm)	97.0%	0.623	0.019	0.642	34.9%	50.00%	0.311
11 c	FEED TO BALL MILL 3 (-10 mm)	97.0%	0.623	0.019	0.642	34.9%	50.00%	0.311
11 d	FEED TO BALL MILL 4 (-10 mm)	97.0%	0.623	0.019	0.642	34.9%	50.00%	0.311
12	TOTAL FEED TO BALL MILL CYCLONES	65.0%	6.227	3.353	9.579	349.3%	50.00%	3.113
13	TOTAL B.M. CYCLONE UNDERFLOW	21.5%	3.736	13.677	17.413	209.6%	50.00%	1.868
14	TOTAL B.M. MAKEUP WATER	0.0%	0.000	14.950	14.950			
15	TOTAL B.M. CYCLONE OVERFLOW	35.0%	2.491	4.626	7.116	139.7%	50.00%	1.245
21	ORE SLIMES TO TAILINGS	5.0%	0.115	2.177	2.291	6.4%	29.80%	0.034
22	DE-SLIMED ORE TO MAG. SEP.	49.3%	2.376	2.449	4.825	133.3%	50.97%	1.211
23	MAG. SEP. 1 DILUTION WATER	0.0%	0.000	31.600	31.600			
24	NET FEED TO MAG. SEP. 1	6.5%	2.376	34.049	36.425	133.3%	50.97%	1.211
25	MAG. SEP 1 TAILS	11.9%	0.755	5.592	6.347	42.4%	21.70%	0.164
26	MAG. SEP. 1 CONC.	5.4%	1.621	28.457	30.078	90.9%	64.62%	1.047
27	MAG. SEP. 2 DILUTION WATER	0.0%	0.000	14.300	14.300			
28	NET FEED TO MAG. SEP. 2	3.7%	1.621	42.757	44.378	90.9%	64.62%	1.047
29	MAG. SEP 2 TAILS	1.5%	0.076	5.002	5.079	4.3%	21.94%	0.017
30	MAG. SEP. 2 CONC.	3.9%	1.545	37.755	39.299	86.6%	66.72%	1.031

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

08-June-2000 IRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
31	MAG. SEP. 3 DILUTION WATER	0.0%	0.000	13.900	13.900			
32	NET FEED TO MAG. SEP. 3	2.9%	1.545	51.655	53.199	86.6%	66.72%	1.031
33	MAG. SEP 3 TAILS	1.5%	0.022	1.420	1.442	1.2%	23.83%	0.005
34	MAG. SEP. 3 CONC.	2.9%	1.523	50.235	51.758	85.4%	67.33%	1.025
35	REGRIND MILL DISCHARGE	65.0%	3.046	1.640	4.686	170.9%	0.00%	0.000
36	NET FEED TO REGRIND MILL CYCLONE	8.1%	4.569	51.875	56.444	256.3%	67.33%	3.076
37	REGRIND MILL CYCLONE O/F PRODUCT TO FLOTATION	2.9%	1.523	50.235	51.758	85.4%	67.33%	1.025
38	REGRIND MILL CYCLONE U/F TO MILL	65.0%	3.046	1.640	4.686	170.9%	67.33%	2.051
39	REGRIND MILL DILUTION WATER	0.0%	0.000	0.000	0.000			
40	FLOTATION DILUTION WATER	0.0%	0.000	5.100	5.100			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: ORIRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
41	FLOTATION CHEMICALS	0.0%	0.000	0.050	0.050			
42	NET FLOTATION FEED	2.7%	1.523	55.385	56.908	85.4%	67.33%	1.025
43	FLOAT TAILS - Fe CONC. TO MAG. IV	2.7%	1.508	55.343	56.851	84.6%	67.67%	1.020
44	SULFUR FLOAT REJECTS TO TAILS	27.0%	0.015	0.041	0.056	0.9%	33.67%	0.005
45	MAG. SEP. 4 CONC.	2.7%	1.467	52.666	54.133	82.3%	68.56%	1.006
46	MAG. SEP. 4 GANGUE REJECT TO TAILS	1.5%	0.041	2.677	2.718	2.3%	35.69%	0.015
47	CONCENTRATE TO PIPELINE FEED	65.0%	1.467	0.790	2.257	82.3%	68.56%	1.006
48	EXCESS WATER FROM CONC. THICK. TO P.W. POND	0.0%	0.000	51.876	51.876			
49	TOTAL REJECTS TO TAILS	5.7%	1.024	16.909	17.933	57.4%	23.40%	0.240
50	DEWATERED TAILINGS TO DISPOSAL	35.0%	1.024	1.901	2.925	57.4%	23.40%	0.240
51	TAILS THICKENER DECANT TO P.W. POND	0.0%	0.000	15.008	15.008			
52	EXCESS WATER FROM TAILS POND	0.0%	0.000	1.389	1.389			
53	FRESH WATER MAKEUP TO P.W. POND	0.0%	0.000	5.232	5.232			
54	EVAPORATION FROM P.W. POND	0.0%	0.000	3.675	3.675			
	TOTAL INPUTS TO P.W. POND	0.0%	0.000	73.506	73.506			
55	TOTAL CONCENTRATOR WATER INPUTS	0.0%	0.000	79.900	79.900			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: ORPIPELINE & ORE RECEIVING (PFD-003)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
43	CONCENTRATE SLURRY FROM PIPELINE	65.0%	1.467	0.790	2.257	82.3%	68.56%	1.006
101	CONCENTRATE FEED TO DEWATERING	65.0%	1.467	0.790	2.257	82.3%	68.56%	1.006
102	NET FILTER FEED	60.0%	2.101	1.400	3.501	117.8%	70.36%	1.478
103	FEED SLURRY DIVERSION TO THICKENERS	65.0%	0.000	0.000	0.000	0.0%	68.56%	0.000
104	FILTER CAKE	92.0%	1.890	0.164	2.055	106.0%	70.36%	1.330
105	FILTRATE	0.0%	0.000	1.096	1.096			
106	FILTER O/F	60.0%	0.210	0.140	0.350	11.8%	70.36%	0.148
107	LAUNDER WASH-DOWN WATER	0.0%	0.000	0.700	0.700			
108	NET FILTER O/F RETURN	20.0%	0.210	0.840	1.050	11.8%	70.36%	0.148
109	THICKENER FEED	50.6%	2.101	2.054	4.154	117.8%	70.36%	1.478
110	THICKENER DECANT	0.0%	0.000	0.653	0.653			
111	THICKENER U/F	60.0%	2.101	1.400	3.501	117.8%	70.36%	1.478
112	EXCESS WATER TO PROCESS WATER	0.0%	0.000	1.749	1.749			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: ORSTOCKPILE, PELLET PLANT SLURRY/FINES HANDLING (BFD-004)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
201	RECYCLE EAF DUST SLURRY	15.0%	0.020	0.112	0.132	1.1%	48.50%	0.010
202	RECYCLE DRI DUST SLURRY	15.0%	0.169	0.957	1.125	9.5%	86.13%	0.145
203	P.P. DUST/FINES SLURRY	15.0%	0.123	0.698	0.821	6.9%	67.64%	0.083
204	P.P. DUST SYSTEMS O.S.	80.0%	0.047	0.012	0.059	2.6%	67.64%	0.032
205	FEED TO P.P. THICKENER	18.5%	0.423	1.861	2.284	23.8%	76.61%	0.324
206	DECANT FROM P.P. THICKENER	0.0%	0.000	1.437	1.437			
207	U/F FROM P.P. THICKENER TO FEED THICK.	50.0%	0.423	0.423	0.847	23.8%	76.61%	0.324
208	DRI CLASSIFIER O/S	75.0%	0.057	0.019	0.075	3.2%	86.39%	0.049
209	-6 mm ORE/PELLET FINES	100.0%	0.055	0.000	0.055	3.1%	67.64%	0.037
210	INDURATED PELLET RECYCLE O/S & U/S	100.0%	0.000	0.000	0.000	0.0%	67.64%	0.000
211	TOTAL FEED TO MILLING	83.8%	0.159	0.031	0.189	8.9%	74.31%	0.118
212	MILL MAKE-UP WATER	0.0%	0.000	0.075	0.075	0.0%		
213	GROUND FINES SLURRY TO P.P. THICKENER	60.0%	0.159	0.106	0.265	8.9%	74.31%	0.118
232	INDURATED PELLETS TO STOCKPILE	100.0%	1.838	0.000	1.838	103.1%	67.64%	1.243
250	RECLAIMED PELLETS	100.0%	1.838	0.000	1.838	103.1%	67.64%	1.243
251	LUMP ORE3 TO STOCKPILE	97.0%	0.000	0.000	0.000	0.0%	0.00%	0.000
252	RECLAIMED LUMP ORE	97.0%	0.000	0.000	0.000	0.0%	0.00%	0.000
253	PELLET/LUMP ORE TO FEED SILOS	100.0%	1.838	0.000	1.838	103.1%	67.64%	1.243
254	EXCESS PELLETS TO SALES	0.0%	0.000	0.000	0.000	0.0%	67.64%	0.000

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: ORGREEN BALL PELLET PRODUCTION: (BFD-005)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
104	FILTER CAKE TO PELLET PLANT	92.0%	1.890	0.164	2.055	106.0%	70.36%	1.330
218	NET OXIDE FEED TO PELLETIZING	91.9%	1.971	0.173	2.144	110.6%	70.29%	1.386
219	PELLETIZING WATER	0.0%	0.000	0.027	0.027	0.0%		
220	COKE TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
221	BINDER TO PELLETIZING	100.0%	0.012	0.000	0.012	0.7%	11.60%	0.001
222	DOLOMITE TO PELLETIZING	100.0%	0.040	0.000	0.040	2.3%	1.61%	0.001
223	LIMESTONE TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
224	HYDRATED LIME TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
225	PELLET FEED MIXTURE	91.0%	2.023	0.200	2.224	113.5%	68.58%	1.388
226	DISC DRESSING MOISTURE	0.0%	0.000	0.012	0.012	0.0%		
227	GREEN BALL PELLETS	90.5%	2.023	0.212	2.236	113.5%	68.58%	1.388
228	COMBINED GREEN BALL O/S & U/S	90.5%	0.081	0.008	0.089	4.5%	68.58%	0.056
229	SIZED GREEN BALL PELLETS	90.5%	1.943	0.204	2.146	109.0%	68.58%	1.332

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: ORINDURATED PELLET PRODUCTION: (BFD-006)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
229	SIZED GREEN BALL PELLETS	90.5%	1.943	0.204	2.146	109.0%	68.58%	1.332
230	INDURATED PELLETS (GROSS)	100.0%	1.970	0.000	1.970	110.5%	67.64%	1.332
231	INDURATED PELLETS (NET)	100.0%	1.838	0.000	1.838	103.1%	67.64%	1.243
232	CRUSHED OVERSIZE PELLETS	100.0%	0.000	0.000	0.000	0.0%	67.64%	0.000
233	UNDERSIZE INDURATED PELLETS	100.0%	0.000	0.000	0.000	0.0%	67.64%	0.000
234	RECYCLED INDURATED PELLET DUST/FINES	100.0%	0.132	0.000	0.132	7.4%	67.64%	0.089
235	P.P. DUST SLURRY WATER	0.0%	0.000	0.698	0.698			
203	P.P. DUST SLURRY TO PELLET FEED	15.0%	0.123	0.698	0.821	6.9%	67.64%	0.089
210	INDURATED PELLET RECYCLE O/S & U/S	100.0%	0.000	0.000	0.000	0.0%	67.64%	0.000

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: ORDRI SYSTEMS, 1 OF 2 (PFD-007)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (T/HR)
253	RECLAIMED PELLETS/LUMP ORE	100.0%	1.8378	0.0000	1.8378	103.1%	67.64%	1.2430
209	-6 mm OXIDE TO PELLETIZING (ORE/PELLETS)	100.0%	0.0551	0.0000	0.0551	3.1%	67.64%	0.0373
299	REMET (OTHER) CHARGED TO SHAFT FCE.	100.0%	0.0000	0.0000	0.0000	0.0%	67.64%	0.0000
300	NET ORE/PELLETS, ETC. TO SHAFT FCE.	100.0%	1.7826	0.0000	1.7826	100.0%	67.64%	1.2057
301	COATING LIME	100.0%	0.0095	0.0000	0.0095	0.5%		
302	LIME COATING WATER	0.0%	0.0000	0.0284	0.0284	0.0%		
303	NET FURNACE FEED	98.4%	1.7921	0.0284	1.8205	100.5%	67.28%	1.2057
304	OFF-GASSES (INCL. DUST/WV)	24.5%	0.1661	0.5127	0.6788	9.3%	86.39%	0.1435
305	GAS QUENCH SCRUB WATER (MM TPY)	0.0%	0.0000	73.6065	73.6065	0.0%		
306	FURNACE DUST TO DUST SCRUBBERS	100.0%	0.0302	0.0000	0.0300	1.7%	86.39%	0.0259
307	FURNACE DUST SCRUB WATER	0.0%	0.0000	2.3448	2.3448	0.0%		
308	FCE DUST SLURRY TO CLASSIFIER	1.3%	0.0300	2.3448	2.3748	1.7%	86.39%	0.0259
309	GAS QUENCH SCRUBBER BLOWDOWN	6.6%	0.1661	2.3448	2.5109	9.3%	86.39%	0.1435
208	COARSE SOLIDS FROM CLASSIFIER	75.0%	0.0565	0.0188	0.0754	3.2%	86.39%	0.0488
310	DE-GRITTED FCE. SCRUB BLOW-DOWN	97.0%	0.1396	4.6707	4.8103	7.8%	86.39%	0.1206
311	PRODUCT SILO SCRUBBER BLOW-DOWN	0.4%	0.0062	1.6079	1.6140	0.3%	91.39%	0.0056
312	OXIDE SCREEN SCRUBBER BLOW-DOWN	100.0%	0.0080	1.6079	1.6159	0.5%	67.64%	0.0054
313	COMPRESSOR COOLING WATER	0.0%	0.0000	6.6994	6.6994	0.0%		
314	PRODUCT SCREEN SCRUBBER	0.6%	0.0150	2.3448	2.3598	0.8%	91.39%	0.0137
315	NET CLARIFIER FEED	0.2%	0.1688	91.0498	91.2186	9.5%	86.13%	0.1454

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: ORDRI SYSTEMS, 2 OF 2 (PFD-008)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
316	CLAR. DECANT TO COOLING SYSTEMS	0.0%	0.0000	90.093	90.093	0.0%		
317	DRI TO SCREENS	100.0%	1.1067	0.000	1.107	62.1%	91.39%	1.0114
318	DRI WITH FINES REMOVED	100.0%	1.0624	0.000	1.062	59.6%	91.39%	0.9710
319	DRI FROM SILOS	100.0%	1.0624	0.000	1.062	59.6%	91.39%	0.9710
320	EXCESS DRI TO SALES	100.0%	0.0000	0.000	0.000	0.0%	91.39%	0.0000
321	DRI TO EAF STORAGE HOPPERS	100.0%	1.0624	0.000	1.062	59.6%	91.39%	0.9710
322	GAS QUENCH O/F WATER TO CLARIFIER	0.0%	0.0000	74.119	74.119	0.0%		
323	INERT GAS (MM Nm3/YR)	0.0%	0.0000	43.000	43.000	0.0%		
324	DRI SCREEN FINES TO EAF INJECTION	100.0%	0.0443	0.000	0.044	2.5%	91.39%	0.0405

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: OREAF STEELMAKING/LMF (PFD-009)

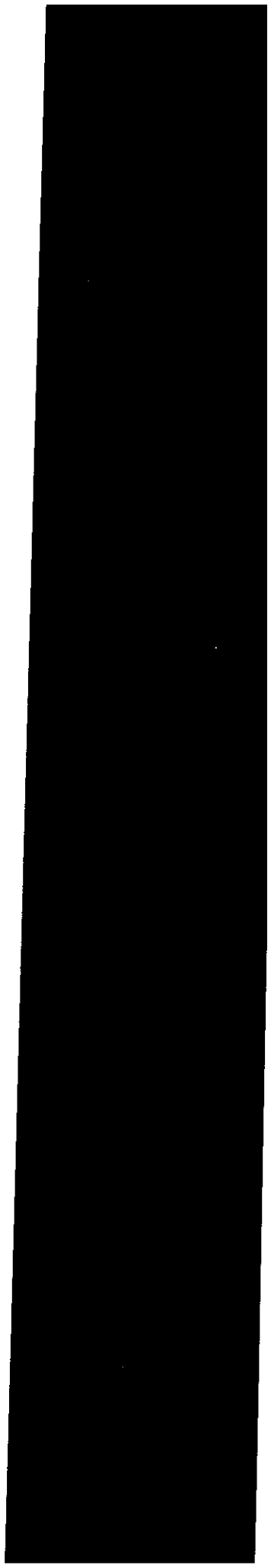
BASIS: 8,000 HRS/YR EAF/LMF/CASTING OPERATION

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	% OF SLAB OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
400	TOTAL DRI FEED TO EAF	100.0%	1.107	0.000	1.107	62.1%	91.39%	1.011
401	LUMP LIME FLUX TO EAF	100.0%	0.013	0.000	0.013	0.7%		
402	SILICA FLUX	100.0%	0.000	0.000	0.000	0.0%		
403	MISC. ADDITIVES (Al, FeMn, FeSi, etc.)	100.0%	0.007	0.000	0.007	1.8%	40.72%	0.013
404	STEEL CARBON (CHARGED+SLAG INJ.)	100.0%	0.010	0.000	0.010	3.0%		
405	EAF ELECTRODES	100.0%	0.004	0.000	0.004	0.5%		
406	TOTAL EAF COOLING WATER CIRC. (MM NM3/YR)	0.0%	0.000	70.627	70.627	0.0%		
407	REVERT SCRAP	100.0%	0.048	0.000	0.048	2.7%	99.70%	0.048
408	PURCHASED SCRAP	100.0%	0.016	0.000	0.016	0.9%	99.70%	0.016
409	NET SCRAP CHARGED	100.0%	0.065	0.000	0.065	3.6%	99.70%	0.065
410	TOTAL FLUX & ADDITIVES CHARGED	100.0%	0.030	0.000	0.030	1.7%	43.80%	0.013
411	REFRACTORIES CONSUMMED	100.0%	0.015	0.000	0.015	0.8%		
412	PROCESS/COOLING WATER OUT OF EAF (MM NM3/YR)	0.0%	0.000	70.627	70.627	0.0%		
413	EAF SLAG (LIQUID)	0.0%	0.000	0.159	0.159	0.0%		
414	EAF DUST TO EAF DUST COLLECTION	100.0%	0.020	0.000	0.020	0.0%	25.60%	0.041
415	OXYGEN GAS TO FURNACE (MM Nm3/YR)	0.0%	0.000	19.250	19.250	1.1%	48.50%	0.010
416	LIQUID EAF STEEL TO LADLE REFINING	0.0%	0.000	1.055	1.055	0.0%		
417	PULVERIZED LIME TO LADLE REF. FCE.	100.0%	0.005	0.000	0.005	0.0%	99.70%	1.052
418	SLAG/WIRE DESULFURIZER TO LRF	100.0%	0.0004	0.0000	0.0034	0.3%		
419	ARGON GAS TO LRF (MM Nm3/YR)	0.0%	0.000	0.063	0.063	0.2%		
						0.0%		

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(BASE CASE: MIDREX SHAFT FURNACE - 100% DRI CHARGE - 2.5% C)

Revision A: OREAF STLMAKING/LMF (PFD-009), CASTING (PFD-010) BASIS: 0 (MM T/YR)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	% OF SLAB OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
420	SLAG & LOSSES FROM LRF	0.0%	0.000	0.007	0.007	0.0%	31.80%	0.002
421	REFINED STEEL TO CASTING	0.0%	0.000	1.053	1.053	0.0%	99.70%	1.050
422	PULVERIZED LIME FLUX TO EAF	100.0%	0.043	0.000	0.012	0.7%		
423	WATER FOR EAF DUST TRANSPORT	0.0%	0.000	0.112	0.112	0.0%		
424	PROC. COOLING WATER LMF	0.0%	0.000	14.125	14.125	0.0%		
425	TOTAL SLAG OUTPUT (AS SOLID)	100.0%	0.159	0.000	0.159	8.9%	26.95%	0.043
501	SLAB SCALE	0.0%	0.005	0.000	0.005	0.3%	80.00%	0.004
502	LADLE SCRAP	0.0%	0.024	0.000	0.024	1.3%	99.70%	0.024
503	TUNDISH SCRAP	100.0%	0.006	0.000	0.006	0.4%	99.70%	0.006
504	CROP END SCRAP	0.0%	0.018	0.000	0.018	1.0%	99.70%	0.018
505	MOLD POWDER TO CASTING	100.0%	0.0006	0.000	0.001	4.8%		
506	TUNDISH POWDER TO CASTING	100.0%	0.0003	0.000	0.000	1.5%		
507	MOLD COOLING WATER (MM NM3/YR)	0.0%	0.000	29.206	29.206	0.0%		
508	CONTACT COOLING WATER (MM NM3/YR)	0.0%	0.164	9.600	9.764	9.2%		
509	NET STEEL TO CASTING	0.0%	0.000	1.000	1.000	0.0%	99.70%	0.997
510	TOTAL CAST SLAB PRODUCT	100.0%	0.977	0.000	0.977	54.8%	99.70%	0.975
511	THIN SLAB TO HOT BAND	#DIV/0!	0.000	0.000	0.000	0.0%	99.70%	0.000
512	SLABS TO SALES	100.0%	0.977	0.000	0.977	54.8%	99.70%	0.975
513	HOT BAND TO SALES	100.0%	0.000	0.000	0.000	0.0%	99.70%	0.000



APPENDIX D-3

30% DRI CHARGED TO EAF - 1.0% CARBON

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

Revision A: OREBODY ASSUMPTIONS

BASIS: 7,940 HRS/YR CONCENTRATOR/PELLET/DRI OPERATION
8,000 HRS/YR EAF/LMF/CASTING OPERATION

TOTAL PLANT PRODUCTION (DRY BASIS):	
2.087	MM TONNES/YEAR AS-MINED ROCK
0.825	MM TONNES/YEAR NET ORE TO CONCENTRATOR
0.486	MM TONNES/YEAR NET CONCENTRATE
0.000	MM TONNES/YEAR LUMP ORE3
0.830	MM TONNES/YEAR GREEN BALL PELLET (+6mm)
0.841	MM TONNES/YEAR TOTAL INDURATED PELLET
0.785	MM TONNES/YEAR NET INDURATED PELLET (+6mm)
0.761	MM TONNES/YEAR FEED TO DRI FCE.
0.367	MM TONNES/YEAR DRI
0.977	MM TONNES/YEAR NET SLAB PRODUCT (BALANCE)
0.000	MM TONNES/YEAR HOT BAND SLAB
0.977	MM TONNES/YEAR NET SLAB PRODUCT
1.000	MM TONNES/YEAR LIQUID STEEL (TARGET)
0.977	MM TONNES/YEAR NET SLAB PRODUCT (TARGET)

						TARGET
61.2	T/HR ORE1 CONC. NET FEED		68.557%	IRON UNITS	IN CONC.	68.560%
0.0	T/HR ORE2		0.000%	IRON UNITS		
0.0	T/HR ORE3		0.000%	IRON UNITS		
61.2	T/HR NET DRI ORE FEED		68.557%	IRON UNITS	89.36%	AS FE304
122.1	T/HR SLAB PRODUCED		8,000	HRS/YR BASIS	10.64%	AS FE2O3
				TARGET		BALANCE
0.367	DRI PROD.	2.072 ORE/P TO DRI		79.932%	Fe RECOV	80.761%
0.977	SLAB PROD.	0.376 DRI TO SLAB		60.000%	Wt.% RECOV	58.900%

CONCENTRATOR	
60.474%	WASTE ROCK - % OF MINED
3.000%	AS-MINED ROCK MOISTURE - %
30.000%	AS-MINED ROCK IRON UNITS - WT.% IRON
50.000%	ORE ROCK IRON UNITS - WT.% IRON
70.0%	GRIZZLY SCREEN O/S - % OF FEED
200.0%	CIRCULATING LOAD - +10 mm TO TERTIARY (% FEED)
0.0%	PERCENT FEED TO SECONDARY 2 (%)
0.0%	PERCENT FEED TO TERTIARY 4 (%)
300.0%	BALL MILL CIRCULATING LOAD (% OF FEED)
65.0%	BALL MILL PERCENT SOLIDS (% OF FEED)
35.0%	B.M. CYCLONE O/F PERCENT SOLIDS (%)
4.60%	GROUND ORE LOSSES TO SLIMES - WT.%
5.00%	DESLIME CYCLONE O/F PERCENT SOLIDS (%)
68.21%	STG.1 MAG. CONC. RECOVERY - WT.% OF FEED
86.39%	STG. 1 IRON UNIT RECOVERY - WT.% OF IRON UNITS
95.30%	STG. 2 MAG. CONC. WT. RECOVERY - WT.% OF FEED
98.50%	STG. 2 MAG. CONC. IRON UNIT RECOV. - WT.% OF IU
98.60%	STG. 3 MAG. CONC. RECOV. - WT.% OF FEED
99.50%	STG. 3 MAG. CONC. IRON UNIT RECOV. - WT.% OF IU
200.00%	REGRIND MILL CIRCULATING LOAD (% OF FEED)
65.00%	REGRIND MILL % SOLIDS (WT.%)
99.00%	S-FLOTATION IRON CONC - WT.% OF FEED
99.50%	S-FLOTATION IRON UNIT RECOV. - WT.% OF IU
97.30%	GAN. REJECT. MAG. SEP. - WT.% OF FEED
98.57%	GAN. REJECT. MAG. SEP. - WT.% OF IU

CONCENTRATOR DEWATERING	
65.0%	WT.% SOLIDS IN CONC. THICK. U/F
35.0%	WT.% SOLIDS IN TAILS. THICK. U/F
0.0%	FEED DIVER. TO THICK. - % OF FEED
10.0%	FILTER FEED O/F - % OF FEED

DRI PLANT	
3.0%	PERCENT OF PELLET FINES - WT.% PEL.
10.0%	PERCENT OF LUMP FINES - WT.% LUMP
4.0%	PERCENT DUST - WT.% OF OXIDE FEED
3.0%	PERCENT -6 mm DRI FINES - WT.% DRI
0.0%	PERCENT REMET CHARGED - WT.% OF FD
0.22%	PERC. LIME FOR COATING - WT.% OF FD
21.83%	SOLIDS IN OFF-GASS - WT.% OF DRI FD
3.94%	SOLIDS IN FCE GAS - WT.% OF DRI FD
28.83%	COARSE SOL. IN CLASS - % OF CLASS FD
1.68%	SOLIDS IN SILO DUST - % OF DRI PROD.
1.06%	SOLIDS IN OXIDE SCRN DUST - %DRI FD
4.08%	SOLIDS IN DRI SCRN DUST - %DRI PROD
93.00%	METALLIZATION - WT.% Fet IN DRI

PELLET PLANT	
6.7%	PERCENT DUST/FINES - WT.% OF G.B.
2.0%	PERCENT U/S GREEN BALL PELLETS
2.0%	PERCENT O/S GREEN BALL PELLETS
0.0%	PERCENT U/S INDURATED PELLETS
0.0%	PERCENT O/S INDURATED PELLETS
25.0%	PERCENT O/S P.P. DUST - % DUST/FINES
0.0%	COKE TO PELLET - % OF FEED
0.6%	BINDER TO PELLET - % OF FEED
2.0%	DOLOMITE TO PELLET - % OF FEED
0.0%	LIMESTONE TO PELLET - % OF FEED
0.0%	HYDRATED LIME TO PELLET - % OF FEED
0.0%	EXCESS PELLETS TO SALES - % OF TOTAL

4.5%	L.O.I.
1.014	RATIO INDUR./G.B. PELLET

EAF/LMF/CASTING	
2.0%	EAF DUST - WT. % OF SLAB
4.0%	DRI TO EAF INJ. - WT.% DRI
1.1%	DOLOMITE ADDITION
0.00%	SILICA FLUX - % EAF FD
0.65%	MISC. ADDIT. - % EAF FD
0.83%	C CHARGED - % EAF FD
0.35%	ELECTRODES - % EAF FD
3.87%	PUL. LIME EAF - % EAF FD
1.34%	REFRACTORIES - % EAF FD
14.34%	EAF SLAG - % EAF FD
2.26%	LADLE SCRAP - % M. STL
0.60%	TUND. SCRAP - % M. STL
99.00%	YIELD TO SLAB - % MS
98.00%	YIELD TO T.SLAB - % MS
98.00%	YIELD HOT BAND - % TS
1.74%	CROP ENDS - % M. STL
4.60%	TOTAL REVERT - %M. STL
65.40%	PURC. SCRAP - % M. STL.
0.50%	PUL. LIME LMF - %M. STL
0.04%	SLG TO LMF - % M. STL
0.64%	SLG FR. LMF - %MS
0.060	ARGON TO LMF - NM3/T MS
0.50%	SLAB SCALE - %MS
0.06%	MOLD POWDER - % M. STL.
0.03%	TUND. POWDER - % M. STL.
100.00%	SLAB PROD. - % OF PROD.
0.27%	SLAG C INJ. - WT% M. STL
25.60%	%Fe IN EAF SLAG

RED = ASSUMPTION INPUT (DATA OR EXPERIENCE) BLUE = DERIVED VARIABLE

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

Revision A: ORIRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
1001	AS-MINED ROCK	97.0%	2.087	0.065	2.152	274.2%	30.00%	0.626
1002	WASTE ROCK	97.0%	1.262	0.039	1.301	165.8%	16.93%	0.214
1	IRON ORE TO CONCENTRATOR (CRUSHING)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413
2	PRODUCT FROM PRIMARY CRUSHER (80% -130 mm)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413
3	FEED TO GRIZZLY (Secondary 1)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413
3 a	FEED TO GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
4	OS FROM GRIZZLY (Secondary 1)	97.0%	0.578	0.018	0.595	75.9%	50.00%	0.289
4 a	OS FROM GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
5	US FROM GRIZZLY (Secondary 1)	97.0%	0.248	0.008	0.255	32.5%	50.00%	0.124
5 a	US FROM GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
6	US FROM SECONDARY 1 (80% -37 mm)	97.0%	0.578	0.018	0.595	75.9%	50.00%	0.289
6 a	US FROM SECONDARY 2 (80% -37 mm)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
7	TOTAL FEED TO TERTIARY CRUSHERS (+10 mm)	97.0%	1.650	0.051	1.701	216.8%	50.00%	0.825
7 a	US FROM TERTIARY 1 (80% -10 mm)	97.0%	0.550	0.017	0.567	72.3%	50.00%	0.275
7 b	US FROM TERTIARY 2 (80% -10 mm)	97.0%	0.550	0.017	0.567	72.3%	50.00%	0.275
7 c	US FROM TERTIARY 3 (80% -10 mm)	97.0%	0.550	0.017	0.567	72.3%	50.00%	0.275
7 d	US FROM TERTIARY 4 (80% -10 mm)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
8	TOTAL FEED TO TERTIARY SCREENS	97.0%	2.475	0.077	2.552	325.2%	50.00%	1.238
9	UNDERSIZE FROM TERTIARY SCREENS (-10 mm)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413
10	TOTAL FEED TO BALL MILLS (-10 mm)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

IRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
10 a	FEED TO BALL MILLS 1&2 (-10 mm)	97.0%	0.413	0.013	0.425	54.2%	50.00%	0.206
10 b	FEED TO BALL MILLS 3&4 (-10 mm)	97.0%	0.413	0.013	0.425	54.2%	50.00%	0.206
11	TOTAL FEED TO BALL MILLS (-10 mm)	97.0%	0.413	0.013	0.425	54.2%	50.00%	0.206
11 a	FEED TO BALL MILL 1 (-10 mm)	97.0%	0.206	0.006	0.213	27.1%	50.00%	0.103
11 b	FEED TO BALL MILL 2 (-10 mm)	97.0%	0.206	0.006	0.213	27.1%	50.00%	0.103
11 c	FEED TO BALL MILL 3 (-10 mm)	97.0%	0.206	0.006	0.213	27.1%	50.00%	0.103
11 d	FEED TO BALL MILL 4 (-10 mm)	97.0%	0.206	0.006	0.213	27.1%	50.00%	0.103
12	TOTAL FEED TO BALL MILL CYCLONES	65.0%	2.063	1.111	3.173	271.0%	50.00%	1.031
13	TOTAL B.M. CYCLONE UNDERFLOW	7.8%	1.238	14.528	15.766	162.6%	50.00%	0.619
14	TOTAL B.M. MAKEUP WATER	0.0%	0.000	14.950	14.950			
15	TOTAL B.M. CYCLONE OVERFLOW	35.0%	0.825	1.532	2.357	108.4%	50.00%	0.413
21	ORE SLIMES TO TAILINGS	5.0%	0.038	0.721	0.759	5.0%	29.80%	0.011
22	DE-SLIMED ORE TO MAG. SEP.	49.3%	0.787	0.811	1.598	103.4%	50.97%	0.401
23	MAG. SEP. 1 DILUTION WATER	0.0%	0.000	31.600	31.600			
24	NET FEED TO MAG. SEP. 1	2.4%	0.787	32.411	33.198	103.4%	50.97%	0.401
25	MAG. SEP 1 TAILS	11.9%	0.250	1.852	2.103	32.9%	21.43%	0.054
26	MAG. SEP. 1 CONC.	1.7%	0.537	30.559	31.096	70.5%	64.74%	0.348
27	MAG. SEP. 2 DILUTION WATER	0.0%	0.000	14.300	14.300			
28	NET FEED TO MAG. SEP. 2	1.2%	0.537	44.859	45.396	70.5%	64.74%	0.348
29	MAG. SEP 2 TAILS	1.5%	0.025	1.657	1.682	3.3%	24.62%	0.006
30	MAG. SEP. 2 CONC.	1.2%	0.512	43.202	43.713	67.2%	66.72%	0.341

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

IRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
31	MAG. SEP. 3 DILUTION WATER	0.0%	0.000	13.900	13.900			
32	NET FEED TO MAG. SEP. 3	0.9%	0.512	57.102	57.613	67.2%	66.72%	0.341
33	MAG. SEP 3 TAILS	1.5%	0.007	0.470	0.478	0.9%	23.83%	0.002
34	MAG. SEP. 3 CONC.	0.9%	0.505	56.631	57.136	66.3%	67.33%	0.340
35	REGRIND MILL DISCHARGE	65.0%	1.009	0.543	1.552	132.6%	0.00%	0.000
36	NET FEED TO REGRIND MILL CYCLONE	2.6%	1.514	57.175	58.688	198.8%	67.33%	1.019
37	REGRIND MILL CYCLONE O/F PRODUCT TO FLOTATION	0.9%	0.505	56.631	57.136	66.3%	67.33%	0.340
38	REGRIND MILL CYCLONE U/F TO MILL	65.0%	1.009	0.543	1.552	132.6%	67.33%	0.679
39	REGRIND MILL DILUTION WATER	0.0%	0.000	0.000	0.000			
40	FLOTATION DILUTION WATER	0.0%	0.000	5.100	5.100			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

Revision A: ORIRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
41	FLOTATION CHEMICALS	0.0%	0.000	0.050	0.050			
42	NET FLOTATION FEED	0.8%	0.505	61.781	62.286	66.3%	67.33%	0.340
43	FLOAT TAILS - Fe CONC. TO MAG. IV	0.8%	0.499	61.768	62.267	65.6%	67.67%	0.338
44	SULFUR FLOAT REJECTS TO TAILS	27.0%	0.005	0.014	0.019	0.7%	33.66%	0.002
45	MAG. SEP. 4 CONC.	0.8%	0.486	60.881	61.367	63.8%	68.56%	0.333
46	MAG. SEP. 4 GANGUE REJECT TO TAILS	1.5%	0.014	0.887	0.900	1.8%	35.69%	0.005
47	CONCENTRATE TO PIPELINE FEED	65.0%	0.486	0.262	0.748	63.8%	68.56%	0.333
48	EXCESS WATER FROM CONC. THICK. TO P.W. POND	0.0%	0.000	60.619	60.619			
49	TOTAL REJECTS TO TAILS	5.7%	0.339	5.601	5.941	44.5%	23.41%	0.079
50	DEWATERED TAILINGS TO DISPOSAL	35.0%	0.339	0.630	0.969	44.5%	23.41%	0.079
51	TAILS THICKENER DECANT TO P.W. POND	0.0%	0.000	4.972	4.972			
52	EXCESS WATER FROM TAILS POND	0.0%	0.000	0.460	0.460			
53	FRESH WATER MAKEUP TO P.W. POND	0.0%	0.000	5.232	5.232			
54	EVAPORATION FROM P.W. POND	0.0%	0.000	3.564	3.564			
	TOTAL INPUTS TO P.W. POND	0.0%	0.000	71.283	71.283			
55	TOTAL CONCENTRATOR WATER INPUTS	0.0%	0.000	79.900	79.900			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

Revision A: ORPIPELINE & ORE RECEIVING (PFD-003)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
43	CONCENTRATE SLURRY FROM PIPELINE	65.0%	0.486	0.262	0.748	63.8%	68.56%	0.333
101	CONCENTRATE FEED TO DEWATERING	65.0%	0.486	0.262	0.748	63.8%	68.56%	0.333
102	NET FILTER FEED	60.0%	0.897	0.598	1.495	117.8%	73.60%	0.660
103	FEED SLURRY DIVERSION TO THICKENERS	65.0%	0.000	0.000	0.000	0.0%	68.56%	0.000
104	FILTER CAKE	92.0%	0.807	0.070	0.877	106.0%	73.60%	0.594
105	FILTRATE	0.0%	0.000	0.468	0.468			
106	FILTER O/F	60.0%	0.090	0.060	0.149	11.8%	73.60%	0.066
107	LAUNDER WASH-DOWN WATER	0.0%	0.000	0.299	0.299			
108	NET FILTER O/F RETURN	20.0%	0.090	0.359	0.448	11.8%	73.60%	0.066
109	THICKENER FEED	48.8%	0.897	0.942	1.839	117.8%	73.60%	0.660
110	THICKENER DECANT	0.0%	0.000	0.344	0.344			
111	THICKENER U/F	60.0%	0.897	0.598	1.495	117.8%	73.60%	0.660
112	EXCESS WATER TO PROCESS WATER	0.0%	0.000	0.812	0.812			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

Revision A: ORSTOCKPILE, PELLET PLANT SLURRY/FINES HANDLING (BFD-004)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
201	RECYCLE EAF DUST SLURRY	15.0%	0.020	0.112	0.132	2.6%	48.50%	0.010
202	RECYCLE DRI DUST SLURRY	15.0%	0.169	0.957	1.125	22.2%	87.61%	0.148
203	P.P. DUST/FINES SLURRY	15.0%	0.053	0.298	0.351	6.9%	70.74%	0.037
204	P.P. DUST SYSTEMS O.S.	80.0%	0.047	0.012	0.059	6.2%	70.74%	0.033
205	FEED TO P.P. THICKENER	18.2%	0.321	1.440	1.761	42.2%	81.23%	0.261
206	DECANT FROM P.P. THICKENER	0.0%	0.000	1.119	1.119			
207	U/F FROM P.P. THICKENER TO FEED THICK.	50.0%	0.321	0.321	0.643	42.2%	81.23%	0.261
208	DRI CLASSIFIER O/S	75.0%	0.057	0.019	0.075	7.4%	87.80%	0.050
209	-6 mm ORE/PELLET FINES	100.0%	0.024	0.000	0.024	3.1%	70.74%	0.017
210	INDURATED PELLET RECYCLE O/S & U/S	100.0%	0.000	0.000	0.000	0.0%	70.74%	0.000
211	TOTAL FEED TO MILLING	80.6%	0.127	0.031	0.158	16.7%	78.32%	0.100
212	MILL MAKE-UP WATER	0.0%	0.000	0.054	0.054	0.0%		
213	GROUND FINES SLURRY TO P.P. THICKENER	60.0%	0.127	0.085	0.212	16.7%	78.32%	0.100
232	INDURATED PELLETS TO STOCKPILE	100.0%	0.785	0.000	0.785	103.1%	70.74%	0.555
250	RECLAIMED PELLETS	100.0%	0.785	0.000	0.785	103.1%	70.74%	0.555
251	LUMP ORE3 TO STOCKPILE	97.0%	0.000	0.000	0.000	0.0%	0.00%	0.000
252	RECLAIMED LUMP ORE	97.0%	0.000	0.000	0.000	0.0%	0.00%	0.000
253	PELLET/LUMP ORE TO FEED SILOS	100.0%	0.785	0.000	0.785	103.1%	70.74%	0.555
254	EXCESS PELLETS TO SALES	0.0%	0.000	0.000	0.000	0.0%	70.74%	0.000

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

Revision A: ORGREEN BALL PELLET PRODUCTION: (BFD-005)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
104	FILTER CAKE TO PELLET PLANT	92.0%	0.807	0.070	0.877	106.0%	73.60%	0.594
218	NET OXIDE FEED TO PELLETIZING	91.9%	0.842	0.074	0.916	110.6%	73.53%	0.619
219	PELLETIZING WATER	0.0%	0.000	0.012	0.012	0.0%		
220	COKE TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
221	BINDER TO PELLETIZING	100.0%	0.005	0.000	0.005	0.7%	11.60%	0.001
222	DOLOMITE TO PELLETIZING	100.0%	0.017	0.000	0.017	2.3%	1.61%	0.000
223	LIMESTONE TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
224	HYDRATED LIME TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
225	PELLET FEED MIXTURE	91.0%	0.864	0.085	0.950	113.5%	71.73%	0.620
226	DISC DRESSING MOISTURE	0.0%	0.000	0.005	0.005	0.0%		
227	GREEN BALL PELLETS	90.5%	0.864	0.091	0.955	113.5%	71.73%	0.620
228	COMBINED GREEN BALL O/S & U/S	90.5%	0.035	0.004	0.038	4.5%	71.73%	0.025
229	SIZED GREEN BALL PELLETS	90.5%	0.830	0.087	0.917	109.0%	71.73%	0.595

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

Revision A: ORINDURATED PELLET PRODUCTION: (BFD-006)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
229	SIZED GREEN BALL PELLETS	90.5%	0.830	0.087	0.917	109.0%	71.73%	0.595
230	INDURATED PELLETS (GROSS)	100.0%	0.841	0.000	0.841	110.5%	70.74%	0.595
231	INDURATED PELLETS (NET)	100.0%	0.785	0.000	0.785	103.1%	70.74%	0.555
232	CRUSHED OVERSIZE PELLETS	100.0%	0.000	0.000	0.000	0.0%	70.74%	0.000
233	UNDERSIZE INDURATED PELLETS	100.0%	0.000	0.000	0.000	0.0%	70.74%	0.000
234	RECYCLED INDURATED PELLET DUST/FINES	100.0%	0.056	0.000	0.056	7.4%	70.74%	0.040
235	P.P. DUST SLURRY WATER	0.0%	0.000	0.298	0.298			
203	P.P. DUST SLURRY TO PELLET FEED	15.0%	0.053	0.298	0.351	6.9%	70.74%	0.040
210	INDURATED PELLET RECYCLE O/S & U/S	100.0%	0.000	0.000	0.000	0.0%	70.74%	0.000

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

Revision A: ORDRI SYSTEMS, 1 OF 2 (PFD-007)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (T/HR)
253	RECLAIMED PELLETS/LUMP ORE	100.0%	0.7848	0.0000	0.7848	103.1%	70.74%	0.5552
209	-6 mm OXIDE TO PELLETIZING (ORE/PELLETS)	100.0%	0.0235	0.0000	0.0235	3.1%	70.74%	0.0167
299	REMET (OTHER) CHARGED TO SHAFT FCE.	100.0%	0.0000	0.0000	0.0000	0.0%	70.74%	0.0000
300	NET ORE/PELLETS, ETC. TO SHAFT FCE.	100.0%	0.7612	0.0000	0.7612	100.0%	70.74%	0.5385
301	COATING LIME	100.0%	0.0095	0.0000	0.0095	1.2%		
302	LIME COATING WATER	0.0%	0.0000	0.0284	0.0284	0.0%		
303	NET FURNACE FEED	96.4%	0.7707	0.0284	0.7991	101.2%	69.88%	0.5385
304	OFF-GASSES (INCL. DUST/WV)	43.0%	0.1661	0.2205	0.3866	21.8%	87.80%	0.1459
305	GAS QUENCH SCRUB WATER (MM TPY)	0.0%	0.0000	73.8987	73.8987	0.0%		
306	FURNACE DUST TO DUST SCRUBBERS	100.0%	0.0304	0.0000	0.0300	3.9%	87.80%	0.0264
307	FURNACE DUST SCRUB WATER	0.0%	0.0000	2.3448	2.3448	0.0%		
308	FCE DUST SLURRY TO CLASSIFIER	1.3%	0.0300	2.3448	2.3748	3.9%	87.80%	0.0264
309	GAS QUENCH SCRUBBER BLOWDOWN	6.6%	0.1661	2.3448	2.5109	21.8%	87.80%	0.1459
208	COARSE SOLIDS FROM CLASSIFIER	75.0%	0.0565	0.0188	0.0754	7.4%	87.80%	0.0496
310	DE-GRITTED FCE. SCRUB BLOW-DOWN	97.0%	0.1396	4.6707	4.8103	18.3%	87.80%	0.1226
311	PRODUCT SILO SCRUBBER BLOW-DOWN	0.4%	0.0062	1.6079	1.6140	0.8%	92.80%	0.0057
312	OXIDE SCREEN SCRUBBER BLOW-DOWN	100.0%	0.0080	1.6079	1.6159	1.1%	70.74%	0.0057
313	COMPRESSOR COOLING WATER	0.0%	0.0000	6.6994	6.6994	0.0%		
314	PRODUCT SCREEN SCRUBBER	0.6%	0.0150	2.3448	2.3598	2.0%	92.80%	0.0139
315	NET CLARIFIER FEED	0.2%	0.1688	91.0498	91.2186	22.2%	87.61%	0.1479

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

Revision A: ORDRI SYSTEMS, 2 OF 2 (PFD-008)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
316	CLAR. DECANT TO COOLING SYSTEMS	0.0%	0.0000	90.093	90.093	0.0%		
317	DRI TO SCREENS	100.0%	0.3674	0.000	0.367	48.3%	92.80%	0.3410
318	DRI WITH FINES REMOVED	100.0%	0.3527	0.000	0.353	46.3%	92.80%	0.3273
319	DRI FROM SILOS	100.0%	0.3527	0.000	0.353	46.3%	92.80%	0.3273
320	EXCESS DRI TO SALES	100.0%	0.0000	0.000	0.000	0.0%	92.80%	0.0000
321	DRI TO EAF STORAGE HOPPERS	100.0%	0.3527	0.000	0.353	46.3%	92.80%	0.3273
322	GAS QUENCH O/F WATER TO CLARIFIER	0.0%	0.0000	74.119	74.119	0.0%		
323	INERT GAS (MM Nm3/YR)	0.0%	0.0000	43.000	43.000	0.0%		
324	DRI SCREEN FINES TO EAF INJECTION	100.0%	0.0147	0.000	0.015	1.9%	92.80%	0.0136

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

16-Sept-1999

Revision A: OREAF STEELMAKING/LMF (PFD-009) BASIS: 8,000 HRS/YR EAF/LMF/CASTING OPERATION

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	% OF SLAB OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
400	TOTAL DRI FEED TO EAF	100.0%	0.367	0.000	0.367	48.3%	92.80%	0.341
401	LUMP LIME FLUX TO EAF	100.0%	0.013	0.000	0.013	1.6%		
402	SILICA FLUX	100.0%	0.000	0.000	0.000	0.0%		
403	MISC. ADDITIVES (Al, FeMn, FeSi, etc.)	100.0%	0.007	0.000	0.007	4.2%	40.72%	0.013
404	STEEL CARBON (CHARGED+SLAG INJ.)	100.0%	0.012	0.000	0.012	7.1%		
405	EAF ELECTRODES	100.0%	0.004	0.000	0.004	1.1%		
406	TOTAL EAF COOLING WATER CIRC. (MM NM3/YR)	0.0%	0.000	70.627	70.627	0.0%		
407	REVERT SCRAP	100.0%	0.048	0.000	0.048	6.4%	99.70%	0.048
408	PURCHASED SCRAP	100.0%	0.688	0.000	0.688	90.4%	99.70%	0.686
409	NET SCRAP CHARGED	100.0%	0.736	0.000	0.736	96.7%	99.70%	0.734
410	TOTAL FLUX & ADDITIVES CHARGED	100.0%	0.032	0.000	0.032	4.2%	40.75%	0.013
411	REFRACTORIES CONSUMMED	100.0%	0.015	0.000	0.015	1.9%		
412	PROCESS/COOLING WATER OUT OF EAF (MM NM3/YR)	0.0%	0.000	70.627	70.627	0.0%		
413	EAF SLAG (LIQUID)	0.0%	0.000	0.158	0.158	0.0%	25.60%	0.041
414	EAF DUST TO EAF DUST COLLECTION	100.0%	0.020	0.000	0.020	2.6%	48.50%	0.010
415	OXYGEN GAS TO FURNACE (MM Nm3/YR)	0.0%	0.000	11.812	11.812	0.0%		
416	LIQUID EAF STEEL TO LADLE REFINING	0.0%	0.000	1.054	1.054	0.0%	99.70%	1.051
417	PULVERIZED LIME TO LADLE REF. FCE.	100.0%	0.005	0.000	0.005	0.7%		
418	SLAG/WIRE DESULFURIZER TO LRF	100.0%	0.0004	0.0000	0.0034	0.4%		
419	ARGON GAS TO LRF (MM Nm3/YR)	0.0%	0.000	0.063	0.063	0.0%		

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(MIDREX SHAFT FURNACE - 30% DRI CHARGE)

16-Sept-1999

Revision A: OREAF STLMAKING/LMF (PFD-009), CASTING (PFD-010) BASIS: 0 (MM T/YR)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	% OF SLAB OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
420	SLAG & LOSSES FROM LRF	0.0%	0.000	0.007	0.007	0.0%	31.80%	0.002
421	REFINED STEEL TO CASTING	0.0%	0.000	1.052	1.052	0.0%	99.70%	1.049
422	PULVERIZED LIME FLUX TO EAF	100.0%	0.014	0.000	0.012	1.5%		
423	WATER FOR EAF DUST TRANSPORT	0.0%	0.000	0.112	0.112	0.0%		
424	PROC. COOLING WATER LMF	0.0%	0.000	14.125	14.125	0.0%		
425	TOTAL SLAG OUTPUT (AS SOLID)	100.0%	0.158	0.000	0.158	20.8%	26.96%	0.043
501	SLAB SCALE	0.0%	0.005	0.000	0.005	0.7%	80.00%	0.004
502	LADLE SCRAP	0.0%	0.024	0.000	0.024	3.1%	99.70%	0.024
503	TUNDISH SCRAP	100.0%	0.006	0.000	0.006	0.8%	99.70%	0.006
504	CROP END SCRAP	0.0%	0.018	0.000	0.018	2.4%	99.70%	0.018
505	MOLD POWDER TO CASTING	100.0%	0.0006	0.000	0.001	11.3%		
506	TUNDISH POWDER TO CASTING	100.0%	0.0003	0.000	0.000	3.5%		
507	MOLD COOLING WATER (MM NM3/YR)	0.0%	0.000	29.206	29.206	0.0%		
508	CONTACT COOLING WATER (MM NM3/YR)	0.0%	0.164	9.600	9.764	21.5%		
509	NET STEEL TO CASTING	0.0%	0.000	0.999	0.999	0.0%	99.70%	0.996
510	TOTAL CAST SLAB PRODUCT	100.0%	0.977	0.000	0.977	128.3%	99.70%	0.974
511	THIN SLAB TO HOT BAND	#DIV/0!	0.000	0.000	0.000	0.0%	99.70%	0.000
512	SLABS TO SALES	100.0%	0.977	0.000	0.977	128.3%	99.70%	0.974
513	HOT BAND TO SALES	100.0%	0.000	0.000	0.000	0.0%	99.70%	0.000

APPENDIX D-4

100% SCRAP CHARGED TO EAF

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

16-Sept-1999 (100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: OREBODY ASSUMPTIONS

BASIS: 7,940 HRS/YR CONCENTRATOR/PELLET/DRI OPERATION
8,000 HRS/YR EAF/LMF/CASTING OPERATION

TOTAL PLANT PRODUCTION (DRY BASIS):	
2.087	MM TONNES/YEAR AS-MINED ROCK
0.825	MM TONNES/YEAR NET ORE TO CONCENTRATOR
0.486	MM TONNES/YEAR NET CONCENTRATE
0.000	MM TONNES/YEAR LUMP ORE3
0.830	MM TONNES/YEAR GREEN BALL PELLET (+6mm)
0.841	MM TONNES/YEAR TOTAL INDURATED PELLET
0.785	MM TONNES/YEAR NET INDURATED PELLET (+6mm)
0.761	MM TONNES/YEAR FEED TO DRI FCE.
0.000	MM TONNES/YEAR DRI
0.977	MM TONNES/YEAR NET SLAB PRODUCT (BALANCE)
0.000	MM TONNES/YEAR HOT BAND SLAB
0.977	MM TONNES/YEAR NET SLAB PRODUCT
1.000	MM TONNES/YEAR LIQUID STEEL (TARGET)
0.977	MM TONNES/YEAR NET SLAB PRODUCT (TARGET)

CONCENTRATOR	
60.474%	WASTE ROCK - % OF MINED
3.000%	AS-MINED ROCK MOISTURE - %
30.000%	AS-MINED ROCK IRON UNITS - WT.% IRON
50.000%	ORE ROCK IRON UNITS - WT.% IRON
70.0%	GRIZZLY SCREEN O/S - % OF FEED
200.0%	CIRCULATING LOAD - +10 mm TO TERTIARY (% FEED)
0.0%	PERCENT FEED TO SECONDARY 2 (%)
0.0%	PERCENT FEED TO TERTIARY 4 (%)
300.0%	BALL MILL CIRCULATING LOAD (% OF FEED)
65.0%	BALL MILL PERCENT SOLIDS (% OF FEED)
35.0%	B.M. CYCLONE O/F PERCENT SOLIDS (%)
4.60%	GROUND ORE LOSSES TO SLIMES - WT.%
5.00%	DESLIME CYCLONE O/F PERCENT SOLIDS (%)
68.21%	STG.1 MAG. CONC. RECOVERY - WT.% OF FEED
86.39%	STG. 1 IRON UNIT RECOVERY - WT.% OF IRON UNITS
95.30%	STG. 2 MAG. CONC. WT. RECOVERY - WT.% OF FEED
98.50%	STG. 2 MAG. CONC. IRON UNIT RECOV. - WT.% OF IU
98.60%	STG. 3 MAG. CONC. RECOV. - WT.% OF FEED
99.50%	STG. 3 MAG. CONC. IRON UNIT RECOV. - WT.% OF IU
200.00%	REGRIND MILL CIRCULATING LOAD (% OF FEED)
65.00%	REGRIND MILL % SOLIDS (WT.%)
99.00%	S-FLOTATION IRON CONC - WT.% OF FEED
99.50%	S-FLOTATION IRON UNIT RECOV. - WT.% OF IU
97.30%	GAN. REJECT. MAG. SEP. - WT.% OF FEED
98.57%	GAN. REJECT. MAG. SEP. - WT.% OF IU

					TARGET
61.2	T/HR ORE1 CONC. NET FEED	68.557%	IRON UNITS	IN CONC.	68.560%
0.0	T/HR ORE2	0.000%	IRON UNITS		
0.0	T/HR ORE3	0.000%	IRON UNITS		
61.2	T/HR NET DRI ORE FEED	68.557%	IRON UNITS	89.36%	AS FE304
122.1	T/HR SLAB PRODUCED	8,000	HRS/YR BASIS	10.64%	AS FE2O3
			TARGET		BALANCE
0.000	DRI PROD. 2.072 ORE/P TO DRI		79.932%	Fe RECOV	80.761%
0.977	SLAB PROD. 0.000 DRI TO SLAB		60.000%	Wt.% RECOV	58.900%

CONCENTRATOR DEWATERING	
65.0%	WT.% SOLIDS IN CONC. THICK. U/F
35.0%	WT.% SOLIDS IN TAILS. THICK. U/F
0.0%	FEED DIVER. TO THICK. - % OF FEED
10.0%	FILTER FEED O/F - % OF FEED

DRI PLANT	
3.0%	PERCENT OF PELLET FINES - WT.% PEL.
10.0%	PERCENT OF LUMP FINES - WT.% LUMP
4.0%	PERCENT DUST - WT.% OF OXIDE FEED
3.0%	PERCENT -6 mm DRI FINES - WT.% DRI
0.0%	PERCENT REMET CHARGED - WT.% OF FD
0.22%	PERC. LIME FOR COATING - WT.% OF FD
21.83%	SOLIDS IN OFF-GASS - WT.% OF DRI FD
3.94%	SOLIDS IN FCE GAS - WT.% OF DRI FD
28.83%	COARSE SOL. IN CLASS - % OF CLASS FD
1.68%	SOLIDS IN SILO DUST - % OF DRI PROD.
1.06%	SOLIDS IN OXIDE SCRN DUST - %DRI FD
4.08%	SOLIDS IN DRI SCRN DUST - %DRI PROD
93.00%	METALLIZATION - WT.% Fet IN DRI

PELLET PLANT	
6.7%	PERCENT DUST/FINES - WT.% OF G.B.
2.0%	PERCENT U/S GREEN BALL PELLETS
2.0%	PERCENT O/S GREEN BALL PELLETS
0.0%	PERCENT U/S INDURATED PELLETS
0.0%	PERCENT O/S INDURATED PELLETS
25.0%	PERCENT O/S P.P. DUST - % DUST/FINES
0.0%	COKE TO PELLET - % OF FEED
0.6%	BINDER TO PELLET - % OF FEED
2.0%	DOLOMITE TO PELLET - % OF FEED
0.0%	LIMESTONE TO PELLET - % OF FEED
0.0%	HYDRATED LIME TO PELLET - % OF FEED
0.0%	EXCESS PELLETS TO SALES - % OF TOTAL

4.5%	L.O.I.
1.014	RATIO INDUR./G.B. PELLET

EAF/LMF/CASTING	
2.0%	EAF DUST - WT. % OF SLAB
4.0%	DRI TO EAF INJ. - WT.% DRI
1.1%	DOLOMITE ADDITION
0.00%	SILICA FLUX - % EAF FD
0.65%	MISC. ADDIT. - % EAF FD
0.83%	C CHARGED - % EAF FD
0.35%	ELECTRODES - % EAF FD
3.87%	PUL. LIME EAF - % EAF FD
1.34%	REFRACTORIES - % EAF FD
14.34%	EAF SLAG - % EAF FD
2.26%	LADLE SCRAP - % M. STL
0.60%	TUND. SCRAP - % M. STL
99.00%	YIELD TO SLAB - % MS
98.00%	YIELD TO T.SLAB - % MS
98.00%	YIELD HOT BAND - % TS
1.74%	CROP ENDS - % M. STL
4.60%	TOTAL REVERT - %M. STL
95.40%	PURC. SCRAP - % M. STL.
0.50%	PUL. LIME LMF - %M. STL
0.04%	SLG TO LMF - % M. STL
0.64%	SLG FR. LMF - %MS
0.060	ARGON TO LMF - NM3/T MS
0.50%	SLAB SCALE - %MS
0.06%	MOLD POWDER - % M. STL.
0.03%	TUND. POWDER - % M. STL.
100.00%	SLAB PROD. - % OF PROD.
0.27%	SLAG C INJ. - WT% M. STL
25.60%	%Fe IN EAF SLAG

RED = ASSUMPTION INPUT (DATA OR EXPERIENCE) BLUE = DERIVED VARIABLE

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

16-Sept-1999 (100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: ORIRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
1001	AS-MINED ROCK	97.0%	2.087	0.065	2.152	274.2%	30.00%	0.626
1002	WASTE ROCK	97.0%	1.262	0.039	1.301	165.8%	16.93%	0.214
1	IRON ORE TO CONCENTRATOR (CRUSHING)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413
2	PRODUCT FROM PRIMARY CRUSHER (80% -130 mm)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413
3	FEED TO GRIZZLY (Secondary 1)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413
3 a	FEED TO GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
4	OS FROM GRIZZLY (Secondary 1)	97.0%	0.578	0.018	0.595	75.9%	50.00%	0.289
4 a	OS FROM GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
5	US FROM GRIZZLY (Secondary 1)	97.0%	0.248	0.008	0.255	32.5%	50.00%	0.124
5 a	US FROM GRIZZLY (Secondary 2)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
6	US FROM SECONDARY 1 (80% -37 mm)	97.0%	0.578	0.018	0.595	75.9%	50.00%	0.289
6 a	US FROM SECONDARY 2 (80% -37 mm)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
7	TOTAL FEED TO TERTIARY CRUSHERS (+10 mm)	97.0%	1.650	0.051	1.701	216.8%	50.00%	0.825
7 a	US FROM TERTIARY 1 (80% -10 mm)	97.0%	0.550	0.017	0.567	72.3%	50.00%	0.275
7 b	US FROM TERTIARY 2 (80% -10 mm)	97.0%	0.550	0.017	0.567	72.3%	50.00%	0.275
7 c	US FROM TERTIARY 3 (80% -10 mm)	97.0%	0.550	0.017	0.567	72.3%	50.00%	0.275
7 d	US FROM TERTIARY 4 (80% -10 mm)	97.0%	0.000	0.000	0.000	0.0%	50.00%	0.000
8	TOTAL FEED TO TERTIARY SCREENS	97.0%	2.475	0.077	2.552	325.2%	50.00%	1.238
9	UNDERSIZE FROM TERTIARY SCREENS (-10 mm)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413
10	TOTAL FEED TO BALL MILLS (-10 mm)	97.0%	0.825	0.026	0.851	108.4%	50.00%	0.413

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

16-Sept-1999 IRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
10 a	FEED TO BALL MILLS 1&2 (-10 mm)	97.0%	0.413	0.013	0.425	54.2%	50.00%	0.206
10 b	FEED TO BALL MILLS 3&4 (-10 mm)	97.0%	0.413	0.013	0.425	54.2%	50.00%	0.206
11	TOTAL FEED TO BALL MILLS (-10 mm)	97.0%	0.413	0.013	0.425	54.2%	50.00%	0.206
11 a	FEED TO BALL MILL 1 (-10 mm)	97.0%	0.206	0.006	0.213	27.1%	50.00%	0.103
11 b	FEED TO BALL MILL 2 (-10 mm)	97.0%	0.206	0.006	0.213	27.1%	50.00%	0.103
11 c	FEED TO BALL MILL 3 (-10 mm)	97.0%	0.206	0.006	0.213	27.1%	50.00%	0.103
11 d	FEED TO BALL MILL 4 (-10 mm)	97.0%	0.206	0.006	0.213	27.1%	50.00%	0.103
12	TOTAL FEED TO BALL MILL CYCLONES	65.0%	2.063	1.111	3.173	271.0%	50.00%	1.031
13	TOTAL B.M. CYCLONE UNDERFLOW	7.8%	1.238	14.528	15.766	162.6%	50.00%	0.619
14	TOTAL B.M. MAKEUP WATER	0.0%	0.000	14.950	14.950			
15	TOTAL B.M. CYCLONE OVERFLOW	35.0%	0.825	1.532	2.357	108.4%	50.00%	0.413
21	ORE SLIMES TO TAILINGS	5.0%	0.038	0.721	0.759	5.0%	29.80%	0.011
22	DE-SLIMED ORE TO MAG. SEP.	49.3%	0.787	0.811	1.598	103.4%	50.97%	0.401
23	MAG. SEP. 1 DILUTION WATER	0.0%	0.000	31.600	31.600			
24	NET FEED TO MAG. SEP. 1	2.4%	0.787	32.411	33.198	103.4%	50.97%	0.401
25	MAG. SEP 1 TAILS	11.9%	0.250	1.852	2.103	32.9%	21.43%	0.054
26	MAG. SEP. 1 CONC.	1.7%	0.537	30.559	31.096	70.5%	64.74%	0.348
27	MAG. SEP. 2 DILUTION WATER	0.0%	0.000	14.300	14.300			
28	NET FEED TO MAG. SEP. 2	1.2%	0.537	44.859	45.396	70.5%	64.74%	0.348
29	MAG. SEP 2 TAILS	1.5%	0.025	1.657	1.682	3.3%	24.62%	0.006
30	MAG. SEP. 2 CONC.	1.2%	0.512	43.202	43.713	67.2%	66.72%	0.341

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

16-Sept-1999 IRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
31	MAG. SEP. 3 DILUTION WATER	0.0%	0.000	13.900	13.900			
32	NET FEED TO MAG. SEP. 3	0.9%	0.512	57.102	57.613	67.2%	66.72%	0.341
33	MAG. SEP 3 TAILS	1.5%	0.007	0.470	0.478	0.9%	23.83%	0.002
34	MAG. SEP. 3 CONC.	0.9%	0.505	56.631	57.136	66.3%	67.33%	0.340
35	REGRIND MILL DISCHARGE	65.0%	1.009	0.543	1.552	132.6%	0.00%	0.000
36	NET FEED TO REGRIND MILL CYCLONE	2.6%	1.514	57.175	58.688	198.8%	67.33%	1.019
37	REGRIND MILL CYCLONE O/F PRODUCT TO FLOTATION	0.9%	0.505	56.631	57.136	66.3%	67.33%	0.340
38	REGRIND MILL CYCLONE U/F TO MILL	65.0%	1.009	0.543	1.552	132.6%	67.33%	0.679
39	REGRIND MILL DILUTION WATER	0.0%	0.000	0.000	0.000			
40	FLOTATION DILUTION WATER	0.0%	0.000	5.100	5.100			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: ORIRON ORE CONCENTRATOR (PFD-002)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
41	FLOTATION CHEMICALS	0.0%	0.000	0.050	0.050			
42	NET FLOTATION FEED	0.8%	0.505	61.781	62.286	66.3%	67.33%	0.340
43	FLOAT TAILS - Fe CONC. TO MAG. IV	0.8%	0.499	61.768	62.267	65.6%	67.67%	0.338
44	SULFUR FLOAT REJECTS TO TAILS	27.0%	0.005	0.014	0.019	0.7%	33.66%	0.002
45	MAG. SEP. 4 CONC.	0.8%	0.486	60.881	61.367	63.8%	68.56%	0.333
46	MAG. SEP. 4 GANGUE REJECT TO TAILS	1.5%	0.014	0.887	0.900	1.8%	35.69%	0.005
47	CONCENTRATE TO PIPELINE FEED	65.0%	0.486	0.262	0.748	63.8%	68.56%	0.333
48	EXCESS WATER FROM CONC. THICK. TO P.W. POND	0.0%	0.000	60.619	60.619			
49	TOTAL REJECTS TO TAILS	5.7%	0.339	5.601	5.941	44.5%	23.41%	0.079
50	DEWATERED TAILINGS TO DISPOSAL	35.0%	0.339	0.630	0.969	44.5%	23.41%	0.079
51	TAILS THICKENER DECANT TO P.W. POND	0.0%	0.000	4.972	4.972			
52	EXCESS WATER FROM TAILS POND	0.0%	0.000	0.460	0.460			
53	FRESH WATER MAKEUP TO P.W. POND	0.0%	0.000	5.232	5.232			
54	EVAPORATION FROM P.W. POND	0.0%	0.000	3.564	3.564			
	TOTAL INPUTS TO P.W. POND	0.0%	0.000	71.283	71.283			
55	TOTAL CONCENTRATOR WATER INPUTS	0.0%	0.000	79.900	79.900			

IMSDRI30

16-Sept-1999

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

(100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: ORPIPELINE & ORE RECEIVING (PFD-003)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
43	CONCENTRATE SLURRY FROM PIPELINE	65.0%	0.486	0.262	0.748	63.8%	68.56%	0.333
101	CONCENTRATE FEED TO DEWATERING	65.0%	0.486	0.262	0.748	63.8%	68.56%	0.333
102	NET FILTER FEED	60.0%	0.897	0.598	1.495	117.8%	73.60%	0.660
103	FEED SLURRY DIVERSION TO THICKENERS	65.0%	0.000	0.000	0.000	0.0%	68.56%	0.000
104	FILTER CAKE	92.0%	0.807	0.070	0.877	106.0%	73.60%	0.594
105	FILTRATE	0.0%	0.000	0.468	0.468			
106	FILTER O/F	60.0%	0.090	0.060	0.149	11.8%	73.60%	0.066
107	LAUNDER WASH-DOWN WATER	0.0%	0.000	0.299	0.299			
108	NET FILTER O/F RETURN	20.0%	0.090	0.359	0.448	11.8%	73.60%	0.066
109	THICKENER FEED	48.8%	0.897	0.942	1.839	117.8%	73.60%	0.660
110	THICKENER DECANT	0.0%	0.000	0.344	0.344			
111	THICKENER U/F	60.0%	0.897	0.598	1.495	117.8%	73.60%	0.660
112	EXCESS WATER TO PROCESS WATER	0.0%	0.000	0.812	0.812			

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: ORSTOCKPILE, PELLET PLANT SLURRY/FINES HANDLING (BFD-004)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
201	RECYCLE EAF DUST SLURRY	15.0%	0.020	0.112	0.132	2.6%	48.50%	0.010
202	RECYCLE DRI DUST SLURRY	15.0%	0.169	0.957	1.125	22.2%	87.61%	0.148
203	P.P. DUST/FINES SLURRY	15.0%	0.053	0.298	0.351	6.9%	70.74%	0.037
204	P.P. DUST SYSTEMS O.S.	80.0%	0.047	0.012	0.059	6.2%	70.74%	0.033
205	FEED TO P.P. THICKENER	18.2%	0.321	1.440	1.761	42.2%	81.23%	0.261
206	DECANT FROM P.P. THICKENER	0.0%	0.000	1.119	1.119			
207	U/F FROM P.P. THICKENER TO FEED THICK.	50.0%	0.321	0.321	0.643	42.2%	81.23%	0.261
208	DRI CLASSIFIER O/S	75.0%	0.057	0.019	0.075	7.4%	87.80%	0.050
209	-6 mm ORE/PELLET FINES	100.0%	0.024	0.000	0.024	3.1%	70.74%	0.017
210	INDURATED PELLET RECYCLE O/S & U/S	100.0%	0.000	0.000	0.000	0.0%	70.74%	0.000
211	TOTAL FEED TO MILLING	80.6%	0.127	0.031	0.158	16.7%	78.32%	0.100
212	MILL MAKE-UP WATER	0.0%	0.000	0.054	0.054	0.0%		
213	GROUND FINES SLURRY TO P.P. THICKENER	60.0%	0.127	0.085	0.212	16.7%	78.32%	0.100
232	INDURATED PELLETS TO STOCKPILE	100.0%	0.785	0.000	0.785	103.1%	70.74%	0.555
250	RECLAIMED PELLETS	100.0%	0.785	0.000	0.785	103.1%	70.74%	0.555
251	LUMP ORE3 TO STOCKPILE	97.0%	0.000	0.000	0.000	0.0%	0.00%	0.000
252	RECLAIMED LUMP ORE	97.0%	0.000	0.000	0.000	0.0%	0.00%	0.000
253	PELLET/LUMP ORE TO FEED SILOS	100.0%	0.785	0.000	0.785	103.1%	70.74%	0.555
254	EXCESS PELLETS TO SALES	0.0%	0.000	0.000	0.000	0.0%	70.74%	0.000

IMSDRI30

16-Sept-1999

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

(100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: ORGREEN BALL PELLET PRODUCTION: (BFD-005)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
104	FILTER CAKE TO PELLET PLANT	92.0%	0.807	0.070	0.877	106.0%	73.60%	0.594
218	NET OXIDE FEED TO PELLETIZING	91.9%	0.842	0.074	0.916	110.6%	73.53%	0.619
219	PELLETIZING WATER	0.0%	0.000	0.012	0.012	0.0%		
220	COKE TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
221	BINDER TO PELLETIZING	100.0%	0.005	0.000	0.005	0.7%	11.60%	0.001
222	DOLOMITE TO PELLETIZING	100.0%	0.017	0.000	0.017	2.3%	1.61%	0.000
223	LIMESTONE TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
224	HYDRATED LIME TO PELLETIZING	100.0%	0.000	0.000	0.000	0.0%		
225	PELLET FEED MIXTURE	91.0%	0.864	0.085	0.950	113.5%	71.73%	0.620
226	DISC DRESSING MOISTURE	0.0%	0.000	0.005	0.005	0.0%		
227	GREEN BALL PELLETS	90.5%	0.864	0.091	0.955	113.5%	71.73%	0.620
228	COMBINED GREEN BALL O/S & U/S	90.5%	0.035	0.004	0.038	4.5%	71.73%	0.025
229	SIZED GREEN BALL PELLETS	90.5%	0.830	0.087	0.917	109.0%	71.73%	0.595

IMSDRI30

16-Sept-1999

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

(100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: ORINDURATED PELLET PRODUCTION: (BFD-006)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
229	SIZED GREEN BALL PELLETS	90.5%	0.830	0.087	0.917	109.0%	71.73%	0.595
230	INDURATED PELLETS (GROSS)	100.0%	0.841	0.000	0.841	110.5%	70.74%	0.595
231	INDURATED PELLETS (NET)	100.0%	0.785	0.000	0.785	103.1%	70.74%	0.555
232	CRUSHED OVERSIZE PELLETS	100.0%	0.000	0.000	0.000	0.0%	70.74%	0.000
233	UNDERSIZE INDURATED PELLETS	100.0%	0.000	0.000	0.000	0.0%	70.74%	0.000
234	RECYCLED INDURATED PELLET DUST/FINES	100.0%	0.056	0.000	0.056	7.4%	70.74%	0.040
235	P.P. DUST SLURRY WATER	0.0%	0.000	0.298	0.298			
203	P.P. DUST SLURRY TO PELLET FEED	15.0%	0.053	0.298	0.351	6.9%	70.74%	0.040
210	INDURATED PELLET RECYCLE O/S & U/S	100.0%	0.000	0.000	0.000	0.0%	70.74%	0.000

IMSDRI30
16-Sept-1999
Revision A: ORDRI SYSTEMS, 1 OF 2 (PFD-007)

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (T/HR)
253	RECLAIMED PELLETS/LUMP ORE	100.0%	0.7848	0.0000	0.7848	103.1%	70.74%	0.5552
209	-6 mm OXIDE TO PELLETIZING (ORE/PELLETS)	100.0%	0.0235	0.0000	0.0235	3.1%	70.74%	0.0167
299	REMET (OTHER) CHARGED TO SHAFT FCE.	100.0%	0.0000	0.0000	0.0000	0.0%	70.74%	0.0000
300	NET ORE/PELLETS, ETC. TO SHAFT FCE.	100.0%	0.7612	0.0000	0.7612	100.0%	70.74%	0.5385
301	COATING LIME	100.0%	0.0095	0.0000	0.0095	1.2%		
302	LIME COATING WATER	0.0%	0.0000	0.0284	0.0284	0.0%		
303	NET FURNACE FEED	96.4%	0.7707	0.0284	0.7991	101.2%	69.88%	0.5385
304	OFF-GASSES (INCL. DUST/WV)	43.0%	0.1661	0.2205	0.3866	21.8%	87.80%	0.1459
305	GAS QUENCH SCRUB WATER (MM TPY)	0.0%	0.0000	73.8987	73.8987	0.0%		
306	FURNACE DUST TO DUST SCRUBBERS	100.0%	0.0304	0.0000	0.0300	3.9%	87.80%	0.0264
307	FURNACE DUST SCRUB WATER	0.0%	0.0000	2.3448	2.3448	0.0%		
308	FCE DUST SLURRY TO CLASSIFIER	1.3%	0.0300	2.3448	2.3748	3.9%	87.80%	0.0264
309	GAS QUENCH SCRUBBER BLOWDOWN	6.6%	0.1661	2.3448	2.5109	21.8%	87.80%	0.1459
208	COARSE SOLIDS FROM CLASSIFIER	75.0%	0.0565	0.0188	0.0754	7.4%	87.80%	0.0496
310	DE-GRITTED FCE. SCRUB BLOW-DOWN	97.0%	0.1396	4.6707	4.8103	18.3%	87.80%	0.1226
311	PRODUCT SILO SCRUBBER BLOW-DOWN	0.4%	0.0062	1.6079	1.6140	0.8%	92.80%	0.0057
312	OXIDE SCREEN SCRUBBER BLOW-DOWN	100.0%	0.0080	1.6079	1.6159	1.1%	70.74%	0.0057
313	COMPRESSOR COOLING WATER	0.0%	0.0000	6.6994	6.6994	0.0%		
314	PRODUCT SCREEN SCRUBBER	0.6%	0.0150	2.3448	2.3598	2.0%	92.80%	0.0139
315	NET CLARIFIER FEED	0.2%	0.1688	91.0498	91.2186	22.2%	87.61%	0.1479

IMSDRI30
16-Sept-1999

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: ORDRI SYSTEMS, 2 OF 2 (PFD-008)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	SOLIDS % OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
316	CLAR. DECANT TO COOLING SYSTEMS	0.0%	0.0000	90.093	90.093	0.0%		
317	DRI TO SCREENS	100.0%	0.3674	0.000	0.367	48.3%	92.80%	0.3410
318	DRI WITH FINES REMOVED	100.0%	0.3527	0.000	0.353	46.3%	92.80%	0.3273
319	DRI FROM SILOS	100.0%	0.3527	0.000	0.353	46.3%	92.80%	0.3273
320	EXCESS DRI TO SALES	100.0%	0.0000	0.000	0.000	0.0%	92.80%	0.0000
321	DRI TO EAF STORAGE HOPPERS	100.0%	0.3527	0.000	0.353	46.3%	92.80%	0.3273
322	GAS QUENCH O/F WATER TO CLARIFIER	0.0%	0.0000	74.119	74.119	0.0%		
323	INERT GAS (MM Nm3/YR)	0.0%	0.0000	43.000	43.000	0.0%		
324	DRI SCREEN FINES TO EAF INJECTION	100.0%	0.0147	0.000	0.015	1.9%	92.80%	0.0136

IMSDRI30

16-Sept-1999

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE

(100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: OREAF STEELMAKING/LMF (PFD-009)

BASIS: 8,000 HRS/YR EAF/LMF/CASTING OPERATION

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	% OF SLAB OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
400	TOTAL DRI FEED TO EAF	100.0%	0.000	0.000	0.000	0.0%	92.80%	0.000
401	LUMP LIME FLUX TO EAF	100.0%	0.012	0.000	0.012	1.6%		
402	SILICA FLUX	100.0%	0.000	0.000	0.000	0.0%		
403	MISC. ADDITIVES (Al, FeMn, FeSi, etc.)	100.0%	0.007	0.000	0.007	4.2%	40.72%	0.013
404	STEEL CARBON (CHARGED+SLAG INJ.)	100.0%	0.012	0.000	0.012	7.1%		
405	EAF ELECTRODES	100.0%	0.004	0.000	0.004	1.1%		
406	TOTAL EAF COOLING WATER CIRC. (MM NM3/YR)	0.0%	0.000	70.627	70.627	0.0%		
407	REVERT SCRAP	100.0%	0.050	0.000	0.050	6.5%	99.70%	0.049
408	PURCHASED SCRAP	100.0%	1.028	0.000	1.028	135.0%	99.70%	1.025
409	NET SCRAP CHARGED	100.0%	1.078	0.000	1.078	141.6%	99.70%	1.074
410	TOTAL FLUX & ADDITIVES CHARGED	100.0%	0.031	0.000	0.031	4.1%	41.75%	0.013
411	REFRACTORIES CONSUMMED	100.0%	0.014	0.000	0.014	1.9%		
412	PROCESS/COOLING WATER OUT OF EAF (MM NM3/YR)	0.0%	0.000	70.627	70.627	0.0%		
413	EAF SLAG (LIQUID)	0.0%	0.000	0.155	0.155	0.0%	25.60%	0.040
414	EAF DUST TO EAF DUST COLLECTION	100.0%	0.020	0.000	0.020	2.6%	48.50%	0.010
415	OXYGEN GAS TO FURNACE (MM Nm3/YR)	0.0%	0.000	11.913	11.913	0.0%		
416	LIQUID EAF STEEL TO LADLE REFINING	0.0%	0.000	1.054	1.054	0.0%	99.70%	1.051
417	PULVERIZED LIME TO LADLE REF. FCE.	100.0%	0.005	0.000	0.005	0.7%		
418	SLAG/WIRE DESULFURIZER TO LRF	100.0%	0.0004	0.0000	0.0034	0.4%		
419	ARGON GAS TO LRF (MM Nm3/YR)	0.0%	0.000	0.063	0.063	0.0%		

IMSDRI30
16-Sept-1999

BASE CASE IRON/STEELMAKING WATER & SOLIDS BALANCE
(100% SCRAP CHARGE TO EAF - NO OTHER IRON UNITS CHARGED)

Revision A: OREAF STLMAKING/LMF (PFD-009), CASTING (PFD-010) BASIS: 0 (MM T/YR)

STREAM NUMBER	STREAM LABLE	% SOLIDS	DRY SOLIDS (MM T/YR)	LIQUID (MM T/YR)	TOTAL (MM T/YR)	% OF SLAB OF DRI FD	%Fe (DRY)	Fe UNITS (MM T/YR)
420	SLAG & LOSSES FROM LRF	0.0%	0.000	0.007	0.007	0.0%	31.80%	0.002
421	REFINED STEEL TO CASTING	0.0%	0.000	1.052	1.052	0.0%	99.70%	1.049
422	PULVERIZED LIME FLUX TO EAF	100.0%	0.000	0.000	0.012	1.5%		
423	WATER FOR EAF DUST TRANSPORT	0.0%	0.000	0.112	0.112	0.0%		
424	PROC. COOLING WATER LMF	0.0%	0.000	14.125	14.125	0.0%		
425	TOTAL SLAG OUTPUT (AS SOLID)	100.0%	0.155	0.000	0.155	20.3%	26.99%	0.042
501	SLAB SCALE	0.0%	0.005	0.000	0.005	0.7%	80.00%	0.004
502	LADLE SCRAP	0.0%	0.024	0.000	0.024	3.1%	99.70%	0.024
503	TUNDISH SCRAP	100.0%	0.006	0.000	0.006	0.8%	99.70%	0.006
504	CROP END SCRAP	0.0%	0.018	0.000	0.018	2.4%	99.70%	0.018
505	MOLD POWDER TO CASTING	100.0%	0.0006	0.000	0.001	11.3%		
506	TUNDISH POWDER TO CASTING	100.0%	0.0003	0.000	0.000	3.5%		
507	MOLD COOLING WATER (MM NM3/YR)	0.0%	0.000	29.206	29.206	0.0%		
508	CONTACT COOLING WATER (MM NM3/YR)	0.0%	0.160	9.600	9.760	21.0%		
509	NET STEEL TO CASTING	0.0%	0.000	0.999	0.999	0.0%	99.70%	0.996
510	TOTAL CAST SLAB PRODUCT	100.0%	0.977	0.000	0.977	128.3%	99.70%	0.974
511	THIN SLAB TO HOT BAND	#DIV/0!	0.000	0.000	0.000	0.0%	99.70%	0.000
512	SLABS TO SALES	100.0%	0.977	0.000	0.977	128.3%	99.70%	0.974
513	HOT BAND TO SALES	100.0%	0.000	0.000	0.000	0.0%	99.70%	0.000