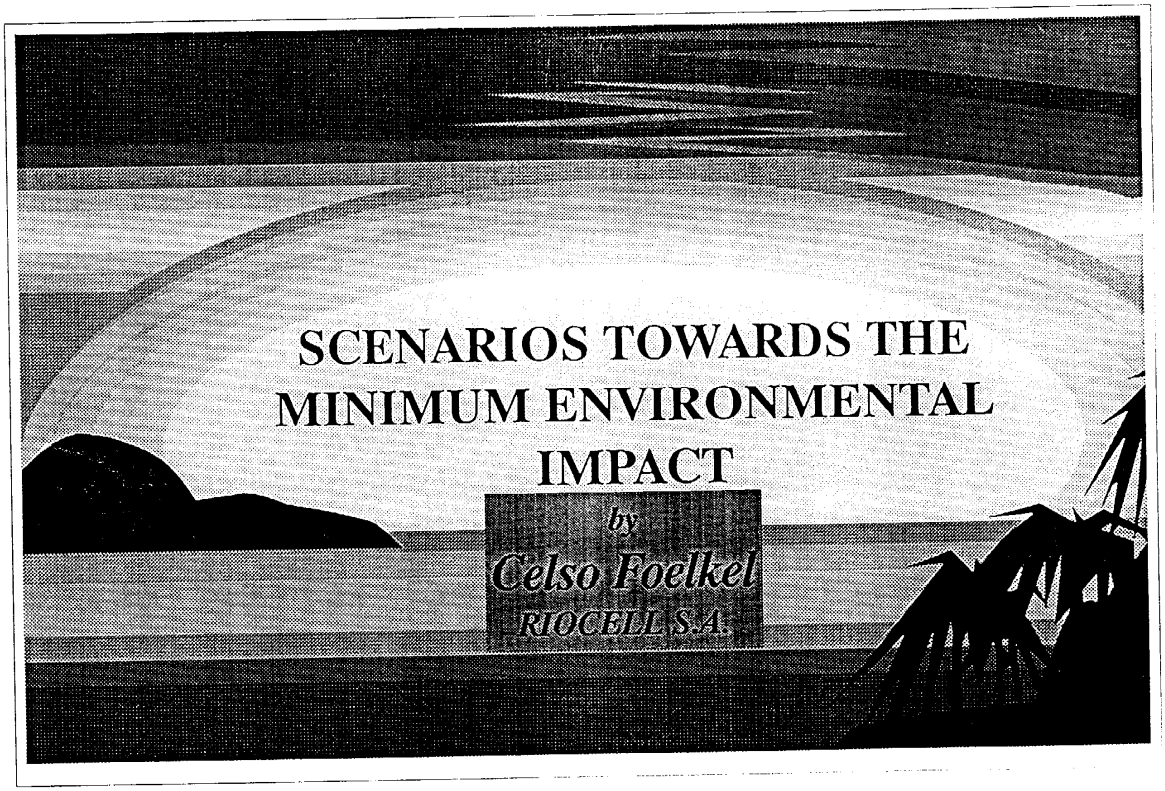
SCENARIOS TOWARDS THE
MINIMUM ENVIRONMENTAL
IMPACT
by
Celso Foelkel
RIOCELL S.A.

TOTAL EFFLUENT FREE MILL

CHANGING TECHNOLOGY ?

OR

END-OF-PIPE MEASURES ?

OR

BOTH ?

TOTAL EFFLUENT FREE MILL

QUINTENARY TREATMENT

THE CLEAN-RIO PROCESS

PRIMARY STAGE:	SETTLING
SECONDARY STAGE:	ACTIVATED SLUDGE
TERTIARY STAGE:	FLOCCULATION / SETTLING
QUATERNARY STAGE:	SAND-BED FILTRATION
QUINTENARY STAGE:	REVERSE OSMOSIS

TOTAL EFFLUENT FREE MILL

THE CLEAN-RIO PROCESS

INVESTMENT COSTS:	**160 US$ / admt/year**
OPERATIONAL COSTS:	**10 US$ / admt**
HANDLING COSTS FOR SOLID RESIDUES:	**4 US$ / admt**

TOTAL EFFLUENT FREE MILL

QUINTENARY TREATMENT

STAGE	kg / admt				
	Cl^-	AOX	COD	BOD	COLOR
RAW EFFLUENT	25	0.50	55	15	120
SETTLING	22	0.35	26	8	100
ACTIVATED SLUDGE	22	0.28	15	0.9	180
FLOCCULATION / SETTLING	18	0.12	4	0.3	20
FILTRATION	18	0.10	2.3	0.25	13
REVERSE OSMOSIS	1.5	0.002	0.25	0.1	0
TOTAL EFFICIENCY, %	94	99.6	99.5	99.3	100

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No papers were required of Session [illegible] speakers and panelists.

INTERNATIONAL NON-CHLORINE BLEACHING™ CONFERENCE, 1994

PROCEEDINGS

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