Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 6 (GX-720) RIVER NAME : Rio Guaxindiba 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 04	JUN 17	AUG 26	SEP 29	OCT 19	NOV 19	FEB 11	MAR 11	APR 12	MAY 24	JUN 22	JUL 20	AUG 18	OCT19	NOV18	DEC15
General number of the laboratory			6094	6912	9113	10929	11973	13423	1779	2761	4782	7767	9094	10944	12581	15516	16820	18540
CODE	PARAMETER	UNITY																
	Time	H	14.40	12.50	10.05	10.30	12.00	12.00	11.20	12.25	12.55	13.10	11.15	11.30	10.40	11.05	10.10	10.25
02062F	Air temperature	C	31.00	25.50	23.00	25.00	32.00	30.00	36.00	26.60	32.00	24.00	25.00	29.00	27.00	29.00	31.00	31.00
02061F	Water temperature	C	27.09	21.00	20.30	21.20	26.21	23.96	30.00	26.30	26.20	21.38	19.23	21.16	20.60	28.06	29.21	29.81
02080F	Transp. (tube)	cm	18.0	12.0			8.0	9.0	0.5	2.5	8.0	15.0	10.0	3.5	5.0	3.0	5.0	3.0
02043F	Conduct. (field)	mS/cm					0.53	0.51	0.72	0.26		0.56	0.39	0.53	0.53	0.69	0.7	0.61
02042F	Conduct. (field)	uS/cm	550	550	737	517					445							
17300F	Salinity (field)	%	0.27	0.28	0.40	0.30	0.25	0.25										
10300F	pH (field)		6.72	7.00	6.50	6.45	7.19	7.31	-	5.20	6.40	6.45	6.75	6.82	6.70	6.94	6.89	6.23
08102F	DO (field)	mg/l	0.30	0.40	0.4	1.7	0.4	0.9	0.6	4.5	2.6	1.0	2.0	0.4	0.6	0.7	-	-
06600L	Cyanide	mg CN/l	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.030	0.040	0.010	0.020	0.030	0.093	0.004	0.102		*
08202L	BOD (total)	mg/l	12	9	20	4	12	1	8	18	20	12	8	20	28	20	40	8
08205L	Dissolved BOD	mg/l	8		12	4												
08301L	COD (total)	mg/l	33	28	70	40	60	40	30	40	55	90	62	77	94	36	125	126
08303L	Dissolved COD	mg/l	-		45	30												
06534L	Phenol	mg/l	0.000	0.000	<0.001	<0.001	<0.001	<0.001	0.001	0.003	0.003	0.090	0.090	0.011	0.015	0.008	0.008	0.014
15408L	Total Phosphorus	mg P/l	1.50	2.00	2.50	0.60	1.20	1.00	3.20	1.40	0.65	1.74	1.06	2.10	2.23	2.32		*
15406L	Diss. Phosphorus	mg P/l	1.00	1.00	1.40	0.20												
15252L	Orthophoshate	mg P/l	0.60	1.00	1.30	0.20	0.40			-	0.25	0.93	0.75	2.04	1.50	1.38	1.56	0.98
	Organic Phosph	mg P/l	0.90	1.00	1.20	0.40	0.80			-	0.40	0.81	0.31	0.06	0.73	0.95		
07556L	Ammonia Nitrogen	mg N/l	3.20	2.70	12.00	2.60	3.00		14.00	0.55	1.45	6.70	4.51	5.57	6.19	6.10	6.29	3.98
07306L	Nitrate Nitrogen	mg N/l	0.07	0.06	0.08	1.60	0.20		<0.01	1.80	0.10	0.074	0.040	0.035	0.014	0.040	0.104	0.02
07209L	Nitrite Nitrogen	mg N/l	0.020	0.009	0.010	0.350	0.200		0.010	0.200	1.000	0.012	0.009	0.006	0.008	0.002	0.056	0.004
07008L	Kjeldahl Nitrogen	mg N/l	6.00	15.00	16.00	5.00	4.20	5.00	16.00	3.50	4.00	19.00	11.12	15.86	18.51	13.61		*
07054L	Diss. Kjeldahl N.	mg N/l	5.00	11.00	16.00	3.40												
07407L	Organic Nitrogen	mg N/l	2.80	12.30	4.00	2.40	1.20		2.00	2.95	2.55	12.30	6.61	10.28	12.32	7.51		
07408L	Diss. Organic N.	mg N/l	1.80	8.30	4.00	0.80												
07801L	Total Nitrogen	mg N/l	6.090	15.069	16.090	6.950	4.600		16.010	5.500	5.100	19.90	11.17	15.90	18.53	13.65		
07802L	Diss. Nitrogen	mg N/l	5.090	11.069	16.090	5.350												
08402L	Total CC alcaline	mg/l	9.1	9.3	9.0	10.4	11.2	9.6	11.2	14.8	10.0	5.4	4.0	7.4	5.4	6.4	5.5	6.2
08403L	Diss. CC alcaline	mg/l	-		8.6	10.4												
08101L	DO	mg/l	0.4	0.6			1		4.8									
06522L	Hexan extractable	mg/l	<4	<4	<4	<4	22	<4	<4									
10401L	Suspended Solids	mg/l	36	18	12	20	40	30	30	400	30	15	8	62	38	50	298	35
08306L	TOC	mg/l	*									13	15	20	<5	32	5	13
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	50		30	5	230	300	30	30000	110	30	1.7	280	300	800	300	5
36101L	Total Coli x1000	MPN/100ml	300		170	50	500	300	80	30000	170	30	5	900	2400	2400	300	24
48004L	Cadmium	mg Cd/l	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
82004L	Lead	mg Pb/l	<0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
29005L	Copper	mg Cu/l	<0.005	0.010	<0.005	0.030	0.030	0.005	<0.005	0.010			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
80013L	Mercury	ug Hg/l	0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.15	<0.10	<0.10	<0.10	<0.10	<0.10	0.20	<0.10	<0.10
30003L	Zinc	mg Zn/l	0.020	0.015	0.020	0.005	0.015	0.010	<0.005	0.120	0.010	0.005	0.030	0.040	0.015	0.020	0.010	<0.005
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.001												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 7 (CC-622) RIVER NAME : Rio Cacerebu 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 05	JUN 17	AUG 27	SEP 29	OCT 22	NOV 24	FEB 11	MAR 30	APR 12	MAY 24	JUN 22	JUL 20	AUG 18	OCT19	NOV17	DEC06
General number of the laboratory			6161	6909	8783	10927	12240	13648	1780	4083	4783	7768	9095	10945	12582	15517	16684	17927
CODE	PARAMETER	UNITY																
	Time	H	11.45	13.20	9.00	10.45	16.45	9.35	11.40	15.45	13.25	13.40	11.45	12.00	11.00	11.30	10.20	11.50
02062F	Air temperature	C	27.00	25.00	24.00	24.00	21.00	27.00	35.50	28.50	32.50	26.00	27.00	30.00	27.00	30.00	34.00	34.00
02061F	Water temperature	C	25.48	21.50	22.20	21.30	25.48	26.15	31.00	26.70	25.40	22.86	20.87	22.35	21.57	28.78	29.76	31.41
02080F	Transp.(tube)	cm	23.0	>30			14.0	6.0	0.6	5.0	9.0	15.0	13.0	12.0	10.0	5.0	5.0	7.5
02043F	Conduct.(field)	mS/cm			16		11.53	0.22	7.54	0.17		0.24	0.49	0.75	1.52	8.54	18.61	12.48
02042F	Conduct.(field)	uS/cm	470	2800		228					170							
17300F	Salinity (field)	%	0.22		9.20	0.10	6.49	0.10										
10300F	pH (field)		5.97	6.49	6.63	6.17	6.71	6.77	-	4.82	5.74	6.49	6.04	6.27	6.65	6.68	6.39	6.80
08102F	DO (field)	mg/l	0.4	1.9	3.4	2.7	1.0	1.3	2.6	1.8	0.7	1.2	2.1	1.4	2.7	3.2	-	-
06600L	Cyanide	mg CN/l	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	0.070	0.020	0.000	0.008	0.010	0.012	0.006		*
08202L	BOD (total)	mg/l	20	5	12	2	8	2	2.8	12	16	8	2	<2.0	6	8	8	7
08205L	Dissolved BOD	mg/l	20		3	2												
08301L	COD (total)	mg/l	25.4	16	-	40	30	40	50	40	40	20	20	18	28	76	-	-
08303L	Dissolved COD	mg/l	-		-	40												
06534L	Phenol	mg/l	<0.001	0.000	<0.001	<0.001	0.004	<0.001	<0.001	0.005	0.003	0.010	0.001	<0.001	0.004	0.002	0.003	<0.001
15408L	Total Phosphorus	mg P/l	0.20	0.10	0.10	0.40	0.20	0.45	0.15	0.60	0.30	0.16	0.14	0.13	0.14	0.15		*
15406L	Diss. Phosphorus	mg P/l	0.06	0.04	0.03	0.10												
15252L	Orthophoshate	mg P/l	0.03	0.02	0.02	0.08	0.05			0.20	0.10	0.07	0.11	0.05	0.03	0.08	0.02	0.01
	Organic Phosph	mg P/l	0.17	0.08	0.08	0.32	0.15			0.40	0.20	0.10	0.03	0.08	0.11	0.08		
07556L	Ammonia Nitrogen	mg N/l	0.40	0.75	0.40	0.20	0.45		0.20	0.10	0.06	0.26	0.15	0.32	0.19	0.13	0.02	0.10
07306L	Nitrate Nitrogen	mg N/l	0.01	0.10	0.20	0.80	0.15		0.05	0.20	0.01	0.324	0.684	0.377	0.372	0.105	0.157	0.14
07209L	Nitrite Nitrogen	mg N/l	0.000	0.030	0.030	0.030	0.010		0.004	0.040	0.040	0.031	0.062	0.025	0.015	0.010	0.029	0.130
07008L	Kjeldahl Nitrogen	mg N/l	1.20	2.00	1.20	1.40	1.60	0.60	1.00	1.20	1.60	11.00	0.86	1.73	1.31	0.98		*
07054L	Diss. Kjeldahl N.	mg N/l	0.95	2.00	1.00	1.00												
07407L	Organic Nitrogen	mg N/l	0.80	1.25	0.80	1.20	1.15		0.80	1.10	1.54	10.74	0.71	1.42	1.11	0.85		
07408L	Diss. Organic N.	mg N/l	0.55	1.25	0.60	0.80												
07801L	Total Nitrogen	mg N/l	1.210	2.130	1.430	2.230	1.760		1.054	1.440	1.650	11.36	1.61	2.13	1.69	1.09		
07802L	Diss. Nitrogen	mg N/l	0.960	2.130	1.230	1.830												
08402L	Total OC alcaline	mg/l	8.9	6.5	8.8	10.4	10.0	9.4	9.0	12.2	10.4	3.6	3.0	3.4	2.2	4.8	0.0	5.8
08403L	Diss. OC alcaline	mg/l	-		7.0	10.2												
08101L	DO	mg/l	1.6	2.6			2.2		6.5									
06522L	Hexan extractable	mg/l	5	6	10	<4	7	<4	12									
10401L	Suspended Solids	mg/l	20	6	25	75	7	26	30	125	16	5	13	5	17	24	47	28
08306L	TOC	mg/l	*									<3	23	<3	12	10	<5	22
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	0.5		7	8	11	17	0.8	17	2.3	50	2.3	0.8	2.3	24	0.8	
36101L	Total Coli x1000	MPN/100ml	5		-	30	17	21	3	50	23	50	8	1.3	13	24	5	
48004L	Cadmium	mg Cd/l	<0.002	0.010	0.030	0.030	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.008	<0.002
82004L	Lead	mg Pb/l	<0.02	0.04	0.12	0.04	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.04	0.02	<0.02
29005L	Copper	mg Cu/l	<0.005	0.010	0.040	0.030	0.050	<0.002	0.020	-			<0.005	<0.005	<0.005	<0.005	0.005	<0.005
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	1.20	<0.10	<0.10
30003L	Zinc	mg Zn/l	0.030	0.030	0.050	0.020	0.040	<0.005	<0.005	0.030	0.020	0.120	0.015	0.020	0.010	0.020	0.015	
18001L	pp' DDT	ug/l	<0.001		<0.001	<0.001												
18022L	op' DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp' DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp' DDD	ug/l	<0.001		<0.001	<0.001												
13170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 8 (GP-600) RIVER NAME : Rio Guapimirim 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 05	JUN 23	AUG 29	SEP 29	OCT 22	NOV 19	FEB 11	MAR 30	APR 12	MAY 26	JUN 22	JUL 20	AUG 18	OCT19	NOV17	DEC06
General number of the laboratory			6162	6929	8784	10928	12239	13426	1781	4082	4784	7899	9096	10946	12583	15518	16683	17928
CODE	PARAMETER	UNITY																
	Time	H	12.40	9	9.25	11.10	16.05	16.15	12.20	14.50	14.00	12.25	12.45	12.25	11.30	12.00	9.50	11.20
02062F	Air temperature	C	27.00	21	24.00	24.00	22.00	29.00	36.50	30.00	32.50	26.00	26.00	28.00	27.00	30.00	30.00	34.00
02061F	Water temperature	C	24.27	22	21.50	20.70	20.47	23.44	30.00	25.10	24.30	21.67	19.42	21.50	20.80	28.58	29.62	28.78
02080F	Transp.(tube)	cm	>30	>30			11.0	14.0	0.7	7.0	20.0	10.0	10.0	13.0	13.0	5.0	10.0	10.0
02043F	Conduct.(field)	mS/cm			0.1		0.02	0.06	0.05	0.02		0.00	0.00	0.00	0.00	0	0	0
02042F	Conduct.(field)	uS/cm	130	130		51	0.03				51							
17300F	Salinity (field)	%	0.06	0.07	0.00	0.00	0.02	0.04										
10300F	pH (field)		6.01	6.42	6.62	6.28	6.24	6.70	-	5.28	5.34	6.31	6.20	5.92	7.15	7.06	6.35	5.07
08102F	DO (field)	mg/l	3.20	1.1	2.4	3.9	6.7	5.4	3.3	4.2	4.0	5.9	5.0	4.5	5.3	6.2	-	-
06600L	Cyanide	mg CN/l	<0.010	-	<0.010	<0.010	0.020	<0.010	<0.010	0.035	<0.010	0.003	0.015	0.001	0.009	0.009		*
08202L	BOD (total)	mg/l	8	<2.0	<2.0	<2.0	2	0.8	<2.0	2.4	4	4	1.6	3.6	<2	2	4	10
08205L	Dissolved BOD	mg/l	4		<2.0	<2.0												
08301L	COD (total)	mg/l	9	9.8	10	55	15	15	10	30	30	40	17	12	6	13	17	20
08303L	Dissolved COD	mg/l	-		<10	20												
06534L	Phenol	mg/l	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.002	0.003	0.005	0.003	0.001	0.005	<0.001	0.000	<0.001
15408L	Total Phosphorus	mg P/l	0.09	0.05	0.04	0.10	0.15	0.10	0.09	0.04	0.07	0.08	0.09	0.08	0.07	0.08		*
15406L	Diss. Phosphorus	mg P/l	0.05	0.03	0.01	0.04												
15252L	Orthophoshate	mg P/l	0.02	0.01	0.01	0.02	0.02			0.15	0.02	0.05	0.02	0.01	0.03	0.03	0.05	0.04
	Organic Phosph	mg P/l	0.07	0.04	0.03	0.08	0.13			0.20	0.05	0.03	0.07	0.07	0.04	0.03		
07556L	Ammonia Nitrogen	mg N/l	0.06	0.05	0.01	0.05	0.06		0.20	0.04	0.01	0.02	0.04	0.05	0.07	0.05	0.05	0.02
07306L	Nitrate Nitrogen	mg N/l	0.10	0.20	0.15	0.35	0.35		0.10	0.25	0.10	0.258	0.176	0.221	0.164	0.274	0.183	0.21
07209L	Nitrite Nitrogen	mg N/l	0.000	0.008	0.004	0.009	0.005		0.005	0.008	0.006	0.005	0.005	0.007	0.004	0.005	0.005	0.148
07008L	Kjeldahl Nitrogen	mg N/l	0.80	0.15	0.60	0.60	1.00	0.35	0.35	0.80	1.20	0.46	0.51	0.68	0.67	0.80		*
07054L	Diss. Kjeldahl N.	mg N/l	0.50	0.15	0.20	0.60												
07407L	Organic Nitrogen	mg N/l	0.74	0.10	0.59	0.55	0.94		0.33	0.76	1.19	0.44	0.47	0.64	0.60	0.75		
07408L	Diss. Organic N.	mg N/l	0.44	0.10	0.19	0.55												
07801L	Total Nitrogen	mg N/l	0.900	0.358	0.754	0.959	1.355		0.455	1.058	1.306	0.72	0.69	0.91	0.83	1.08		
07802L	Diss. Nitrogen	mg N/l	0.600	0.358	0.354	0.959												
08402L	Total OC alcaline	mg/l	6.9	3.5	3.8	9.6	7.2	5.8	3.4	7.2	7.4	2.0	1.8	1.0	1.0	1.6	2.4	3.0
08403L	Diss. OC alcaline	mg/l	-		3.8	8.6												
08101L	DO	mg/l	3.2	2.2			7.2		7.6									
06522L	Hexan extractable	mg/l	<4	<4	50	<4	10	<4	<4									
10401L	Suspended Solids	mg/l	20		6	20	20	28	20	50	10	9	30	4	21	7	12	10
08306L	TOC	mg/l	*									<5	<5	<5	7	<5	<5	<5
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	2.3		13	5	130	5	8	13	2.3	30	2.3	13	5	80	13	
36101L	Total Coli x1000	MPN/100ml	24		-	30	500	5	23	23	13	240	28	80	80	240	30	
48004L	Cadmium	mg Cd/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	<0.002
82004L	Lead	mg Pb/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.12	<0.02	<0.02
29005L	Copper	mg Cu/l	<0.005	0.020	<0.005	0.030	0.030	<0.002	<0.005	-			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	0.10	<0.10
30003L	Zinc	mg Zn/l	0.010	0.015	0.100	0.005	0.080	<0.005	<0.005	<0.005	0.010	<0.005	0.015	0.015	<0.005	<0.005	<0.005	
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.001												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 9 (MC-967) RIVER NAME : Rio Macacu 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 05	JUN 22	AUG 29	SEP 29	OCT 19	NOV 19	FEB 11	MAR 30	APR 13	MAY 27	JUN 24	JUL 22	AUG 16	OCT21	NOV18	
General number of the laboratory			6163	6928	8786	10928	11979	13424	1783	4080	4939	7920	9324	11061	124478	15527	16821	
CODE	PARAMETER	UNITY																
	Time	H	15.55	15.25	10.50	11.55	13.15	13.00	18.30	10.05	10.10	14.40	13.35	13.15	11.20	11.55	11.10	NO
02062F	Air temperature	C	27.00	25	26.00	29.00	33.00	32.00	31.50	26.50	28.00	29.00	30.00	32.00	26.00	31.00	31.00	SAMPLING
02061F	Water temperature	C	24.96	23	19.40	21.40	26.58	22.50	29.00	24.30	22.40	21.77	19.74	21.09	19.64	26.48	26.48	
02080F	Transp. (tube)	cm	>30	>30			12.0	13.0	0.7	9.0	22.0	17.0	15.0	15.0	12.0	21.0	5.0	
02043F	Conduct. (field)	mS/cm			0		0.03	0.02	0.4	0.04	0.03	0.00	0.00	0.00	0.00	0	0	
02042F	Conduct. (field)	uS/cm	69	80		33												
17300F	Salinity (field)	%	0.04	0.04	0.00	0.00	0.02	0.02										
10300F	pH (field)		6.89	6.86	6.06	7.04	6.69	7.35	-	7.45	5.55	6.29	6.03	5.57	6.13	6.57	6.53	
08102F	DO (field)	mg/l	7.90	1.7	8.8	8.9	5.7	8.9	3.3	7.9	8.9	9.0	9.6	9.6	-	8.4	-	
06600L	Cyanide	mg CN/l	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	0.030	<0.010	0.000	0.018	0.004	<0.001	0.010		
08202L	BOD (total)	mg/l	<2	<2.0	<2.0	<2.0	<2.0	0.4	<2	<2.0	<2.0	0.4	0.6	1.4	1.4	2	1.6	
08205L	Dissolved BOD	mg/l	<2		<2.0	<2.0												
08301L	COD (total)	mg/l	6.4	3.7	<10	15	<10	15	<10	10	<10	6	50	20	2	35	<10	
08303L	Dissolved COD	mg/l	-		<10	6												
06534L	Phenol	mg/l	<0.001	0.001	<0.001	0.007	<0.001	<0.001	<0.001	0.001	0.001	0.002	0.002	<0.001	0.002	0.009	0.014	
15408L	Total Phosphorus	mg P/l	0.08	0.05	0.04	0.07	0.09	0.08	0.08	0.25	0.05	0.05	0.04	0.04	0.06	0.05		
15406L	Diss. Phosphorus	mg P/l	0.04	0.03	0.01	0.03												
15252L	Orthophoshate	mg P/l	0.02	0.02	0.01	0.01	0.02			0.15	0.02	0.04	0.03	0.01	0.03	0.01	0.09	
	Organic Phosph	mg P/l	0.06	0.03	0.03	0.06	0.07			0.10	0.03	0.01	0.01	0.03	0.03	0.04		
07556L	Ammonia Nitrogen	mg N/l	0.04	0.08	0.07	0.02	0.25		<0.01	0.04	0.01	0.04	0.02	0.02	0.08	0.03	0.09	
07306L	Nitrate Nitrogen	mg N/l	0.20	0.30	0.20	0.30	0.30		0.15	0.30	0.15	0.307	0.240	0.178	0.181	0.138	0.210	
07209L	Nitrite Nitrogen	mg N/l	0.000	0.006	0.004	0.003	0.004		0.005	0.003	0.003	0.003	0.004	0.006	0.006	0.004	0.007	
07008L	Kjeldahl Nitrogen	mg N/l	0.55	0.20	0.55	0.25	0.60	0.50	0.25	1.00	0.25	0.20	0.67	0.39	0.34	0.20		
07054L	Diss. Kjeldahl N.	mg N/l	0.45	0.20	0.30	0.25												
07407L	Organic Nitrogen	mg N/l	0.51	0.12	0.48	0.23	0.35		0.25	0.96	0.24	0.16	0.65	0.36	0.26	0.17		
07408L	Diss. Organic N.	mg N/l	0.41	0.12	0.23	0.23												
07801L	Total Nitrogen	mg N/l	0.750	0.506	0.754	0.553	0.904		0.405	1.303	0.403	0.51	0.92	0.57	0.53	0.34		
07802L	Diss. Nitrogen	mg N/l	0.650	0.506	0.504	0.553												
08402L	Total CC alcaline	mg/l	2.1	1.9	1.8	3.4	3.0	1.8	2.2	5.8	0.8	0.6	1.4	2.0	0.4	1.0	5.8	
08403L	Diss. CC alcaline	mg/l	-		1.4	2.6												
08101L	DO	mg/l	7.6	8.8			8.2		7.8									
06522L	Hexan extractable	mg/l	<4	4	<4	<4	<4	<4	15									
10401L	Suspended Solids	mg/l	20		5	15	10	36	20	60	18	9	6	10	11	10	22	
08306L	TOC	mg/l	*									8	<5	<5	<5	5	5	
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	13		13	17	13	230	500	50	50	23	17	5	2.4	13	50	
36101L	Total Coli x1000	MPN/100ml	30		-	-	90	230	1300	50	230	23	80	8	2.4	30	90	
48004L	Cadmium	mg Cd/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	
82004L	Lead	mg Pb/l	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.10	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	
29005L	Copper	mg Cu/l	<0.005	0.010	<0.005	0.006	0.030	<0.002	<0.005	-			<0.005	<0.005	<0.005	<0.005	<0.005	
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
30003L	Zinc	mg Zn/l	0.050	0.050	0.040	<0.005	0.020	0.02	<0.005	0.040	0.180	0.010	0.140	0.010	0.030	0.090	0.005	
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.001												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 10 (SB-998) RIVER NAME : Rio Soberbo 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 08	JUN 22	AUG 27	SEP 30	OCT 20	NOV 19	FEB 10	MAR 30	APR 13	MAY 27	JUN 24	JUL 22	AUG 16	OCT20	NOV18	
General number of the laboratory			6417	6927	8785	10968	12002	13425	1692	4081	4940	7919	9325	11060	12447	15526	16822	
CODE	PARAMETER	UNITY																
	Time	H	11.40	13.1	10.10	11.15	10.54	14.00	14.20	12.20	11.15	13.20	11.25	11.15	10.30	11.05	11.50	NO
02062F	Air temperature	C	26.50	25	24.00	28.00	31.00	32.00	34.00	27.00	32.50	28.50	27.00	31.00	25.00	27.00	32.00	SAMPLING
02061F	Water temperature	C	24.20	24	22.10	21.70	25.09	23.61	31.00	24.80	23.78	22.61	19.94	21.28	20.68	26.42	27.61	
02080F	Transp.(tube)	cm	8.5	8			18.0	8.0	0.8	20.0	17.0	15.0	13.0	13.0	9.0	12.0	5.0	
02043F	Conduct.(field)	mS/cm			0.2		0.08	0.06	0.11	0.07	0.31	0.00	0.00	0.03	0.03	0.03	0	
02042F	Conduct.(field)	uS/cm	140	220		69					170							
17300F	Salinity (field)	%	0.07	0.11	0.10	0.00	0.04	0.04										
10300F	pH (field)		5.67	5.47	5.47	7.62	6.44	6.93	-	6.43	5.67	5.66	5.79	5.43	5.62	5.97	6.17	
08102F	DO (field)	mg/l	2.50	1.3	1.2	7.5	2.6	8.1	1.4	7.0	7.2	2.8	4.2	1.5	4.1	0.6	-	
06600L	Cyanide	mg CN/l	0.0	<0.010	<0.010	<0.010	0.010	<0.010	0.010	0.015	<0.010	0.004	0.010	0.007	0.011	0.009		
08202L	BOD (total)	mg/l	96	160	120	13	20	13	50	13.2	11.6	28	23.2	60	60	40	5	
08205L	Dissolved BOD	mg/l	60		70	13												
08301L	COD (total)	mg/l	270	230	220	60	75	50	80	15	30	30	70	69	82	35	34	
08303L	Dissolved COD	mg/l	-		180	30												
06534L	Phenol	mg/l	0.010	0.020	0.010	<0.001	0.002	<0.001	0.006	0.001	0.005	0.022	0.002	0.012	0.012	0.016	0.004	
15408L	Total Phosphorus	mg P/l	0.20	0.40	0.25	0.10	0.20	0.08	0.20	0.20	0.05	0.11	0.09	0.16	0.10	0.23		
15406L	Diss. Phosphorus	mg P/l	0.03	0.05	0.06	0.05												
15252L	Orthophoshate	mg P/l	0.02	0.02	0.04	0.02	0.03			0.15	0.02	0.05	0.04	0.02	0.02	0.03	0.01	
	Organic Phosph	mg P/l	0.18	0.38	0.21	0.08	0.17			0.05	0.03	0.06	0.04	0.14	0.08	0.20		
07556L	Ammonia Nitrogen	mg N/l	0.04	0.10	0.14	0.15	0.20		0.20	0.04	0.02	0.05	0.03	0.02	0.27	0.10	0.01	
07306L	Nitrate Nitrogen	mg N/l	0.03	0.15	0.15	0.20	0.10		<0.01	0.20	0.10	0.126	0.103	0.012	0.100	0.046	0.181	
07209L	Nitrite Nitrogen	mg N/l	0.010	0.004	0.003	0.020	0.010		0.020	0.010	0.009	0.005	0.006	0.002	0.002	0.002	0.017	
07008L	Kjeldahl Nitrogen	mg N/l	1.00	2.00	1.40	1.20	1.20	0.35	0.50	0.60	0.40	0.72	0.94	0.97	1.11	1.35		
07054L	Diss. Kjeldahl N.	mg N/l	0.50	1.20	1.00	0.45												
07407L	Organic Nitrogen	mg N/l	0.96	1.90	1.26	1.05	1.00		0.30	0.56	0.38	0.67	0.92	0.95	0.84	1.25		
07408L	Diss. Organic N.	mg N/l	0.46	1.10	0.86	0.30												
07801L	Total Nitrogen	mg N/l	1.040	2.154	1.553	1.420	1.310		0.520	0.810	0.509	0.85	1.05	0.98	1.22	1.40		
07802L	Diss. Nitrogen	mg N/l	0.540	1.354	1.153	0.670												
08402L	Total CC alcaline	mg/l	32.5	52.5	36.0	10.2	11.8	10.4	24.0	9.2	7.0	5.0	5.6	8.2	6.0	7.2	5.6	
08403L	Diss. CC alcaline	mg/l	-		30.0	9.8												
08101L	DO	mg/l	3.2	1.8			4.2		-									
06522L	Hexan extractable	mg/l	33	<4	<4	4	9	<4	65									
10401L	Suspended Solids	mg/l	150		45	20	50	56	45	20	15	7	9	16	8	23	32	
08306L	TCC	mg/l	*									23	11	19	39	<5	5	
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	3000		160	90	50	30	8	300	500	70	110	300	2300	500	900	
36101L	Total Coli x1000	MPN/100ml	24000		-	>160	110	30	50	1600	2200	90	220	5000	2300	5000	900	
48004L	Cadmium	mg Cd/l	0.000	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
82004L	Lead	mg Pb/l	<0.02	0.08	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	0.10	<0.02	<0.02	<0.02	<0.02	0.20	<0.02	
29005L	Copper	mg Cu/l	0.010	0.010	0.010	0.060	0.005	<0.002	<0.005	-			<0.005	<0.005	<0.005	<0.005	<0.005	
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	0.02	<0.010	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
80013L	Mercury	ug Hg/l	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
30003L	Zinc	mg Zn/l	0.040	0.080	0.040	0.010	0.030	0.005	<0.005	0.005	0.060	0.040	0.010	0.010	0.010	0.030	0.010	
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 11 (MG-580) RIVER NAME : Canal de Mage 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 07	JUN 23	AUG 27	SEP 30	OCT 22	NOV 24	FEB 10	MAR 31	APR 12	MAY 26	JUN 23	JUL 21	AUG 17	OCT19	NOV17	DEC06
General number of the laboratory			6388	6930	9213	10967	12237	13649	1691	4177	4785	7895	9220	11026	12507	15519	16679	17929
CODE	PARAMETER	UNITY																
	Tiee	H	14.10	9.5	9.20	10.50	15.15	10.05	12.30	13.00	14.35	11.50	11.40	12.25	11.00	12.25	9.30	11.00
02062F	Air temperature	C	29.00	26	25.00	28.00	22.00	26.00	34.00	28.00	34.00	26.00	27.00	28.00	26.00	30.00	29.00	32.00
02061F	Water temperature	C	29.80	24	24.40	25.50	23.10	26.72	31.00	27.00	28.50	27.04	24.32	26.09	25.55	29.45	29.36	29.27
02080F	Transp.(tube)	cm	9.0	28			11.0	5.0	0.5	9.0	6.0	5.0	5.0	2.5	2.5	1.0	2.5	3.0
02043F	Conduct.(field)	mS/cm					1.4	0.95	1.64	0.31		0.74	0.98	0.98	1.27	4.01	8.54	1.12
02042F	Conduct.(field)	uS/cm	1520	4670	3100	707					716							
17300F	Salinity (field)	%	0.69	2.57	1.80	0.30	0.71	0.45										
10300F	pH (field)		8.31	9.14	7.44	8.27	7.49	7.25	-	5.52	7.08	8.66	9.45	6.77	7.39	7.19	8.24	6.66
08102F	DO (field)	mg/l	2.40	0.4	0.4	0.9	0.5	0.2	0.9	2.8	1.1	1.6	1.7	0.5	1.9	0.3	-	-
06600L	Cyanide	mg CN/l	0.020	-	0.020	<0.010	0.015	<0.010	<0.010	0.040	0.025	0.022	0.039	0.029	0.080	0.080		*
08202L	BOD (total)	mg/l	42	50	30	16	12	20	40	12	30	50	52	52	44	30	40	50
08205L	Dissolved BOD	mg/l	24		20	12												
08301L	COD (total)	mg/l	180	78.5	50	80	70	70	60	40	120	130	142	132	250	145	544	100
08303L	Dissolved COD	mg/l	-		40	35												
06534L	Phenol	mg/l	0.010	0.001	0.002	<0.001	<0.001	0.005	0.006	0.008	0.010	0.007	0.006	0.037	0.015	0.007	0.017	0.018
15408L	Total Phosphorus	mg P/l	2.00	3.00	2.50	1.30	0.60	1.50	2.20	0.80	0.80	1.65	1.49	1.69	1.72	1.76		*
15406L	Diss.Phosphorus	mg P/l	1.00	2.00	2.10	0.50												
15252L	Orthophoshate	mg P/l	0.90	0.20	2.10	0.40	0.20			0.40	0.60	0.99	1.08	1.32	1.19	0.85	1.56	0.66
	Organic Phosph	mg P/l	1.10	2.80	0.40	0.90	0.40			0.40	0.20	0.66	0.41	0.37	0.54	0.91		
07556L	Ammonia Nitrogen	mg N/l	2.80	3.00	80.00	6.00	4.00		2.20	0.70	2.10	4.20	3.84	4.66	5.40	5.71	4.41	3.74
07206L	Nitrate Nitrogen	mg N/l	<0.01	0.30	0.04	0.08	0.07		<0.01	0.50	0.02	0.029	0.105	0.045	0.012	0.009	0.036	1.32
07209L	Nitrite Nitrogen	mg N/l	0.030	0.020	0.003	0.070	0.020		0.004	3.000	0.020	0.006	0.025	0.006	0.014	0.004	0.007	1.085
07008L	Kjeldahl Nitrogen	mg N/l	12.00	2.50	18.00	7.00	8.00	20.00	10.00	3.50	8.00	11.55	13.49	15.89	18.20	13.47		*
07054L	Diss.Kjeldahl N.	mg N/l	10.00	3.00	16.00	7.00												
07407L	Organic Nitrogen	mg N/l	9.20	0.50	10.00	1.00	4.00		7.80	2.80	5.90	7.35	9.65	11.23	12.81	7.76		
07408L	Diss.Organic N.	mg N/l	7.20	0.00	8.00	1.00												
07801L	Total Nitrogen	mg N/l	12.030	3.820	18.043	7.150	8.090		10.004	7.000	8.040	11.58	13.62	15.94	18.23	13.48		
07802L	Diss.Nitrogen	mg N/l	10.030	3.320	16.043	7.150												
08402L	Total OC alcaline	mg/l	25.5	24.5	10.2	22.0	10.6	10.2	11.4	9.8	21.0	20.0	6.2	7.4	6.0	6.0	6.6	7.2
08403L	Diss.OC alcaline	mg/l	-		10.0	18.0												
08101L	DO	mg/l	0.6	0			1.6		-									
06522L	Hexan extractable	mg/l	35	<4	<4	<4	5	<4	65									
10401L	Suspended Solids	mg/l	75		30	30	20	20	20	45	30	32	69	38	46	35	76	50
08306L	TOC	mg/l	*									44	53		32	26	16	25
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	30000		8000	>160	800	3000	90000	30000	G1600	3000	50	13000	1700	13000	240000	24000
36101L	Total Coli x1000	MPN/100ml	90000		2400	>160	2300	16000	160000	50000	G1600	3000	50	17000	8000	23000	240000	24000
48004L	Cadmium	mg Cd/l	0.000	0.012	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	0.004
82004L	Lead	mg Pb/l	<0.02	0.08	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.55	<0.02	0.04
29005L	Copper	mg Cu/l	0.030	0.010	<0.005	0.060	0.030	0.010	<0.005	-			<0.005	<0.005	<0.005	0.010	0.010	0.010
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
80013L	Mercury	ug Hg/l	0.15	0.80	<0.10	<0.10	<0.10	<0.10	0.15	<0.10	<0.10	<0.10	0.25	<0.10	<0.10	0.10	0.15	<0.10
30003L	Zinc	mg Zn/l	0.020	0.030	0.015	0.100	0.070	<0.005	0.010	0.010	0.015	0.060	0.040	0.030	0.020	0.030	0.030	0.015
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 12 (RN-560) RIVER NAME : Rio Roncador 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 07	JUN. 23	AUG 27	SEP 30	OCT 22	NOV 24	FEB 10	MAR 31	APR 13	MAY 26	JUN 23	JUL 21	AUG 17	OCT19	NOV17	DEC06
General number of the laboratory			6387	6931	9214	10966	12236	13650	1690	4178	4942	7896	9221	11021	12504	15520	16680	17930
CODE	PARAMETER	UNITY																
	Time	H	13.50	10.35	9.40	10.35	14.55	10.25	12.05	13.20	13.35	11.25	11.20	12.05	10.45	12.45	9.15	10.45
02062F	Air temperature	C	31.00	25	24.00	28.00	22.50	27.00	34.00	28.00	33.50	26.00	25.00	31.00	26.00	30.00	29.00	31.00
02061F	Water temperature	C	25.26	22	21.40	21.30	20.46	22.09	30.00	25.50	25.23	21.78	18.91	21.99	21.09	29.47	30.23	29.72
02080F	Transp.(tube)	cm	28.0	>30			22.0	10.0	0.7	9.0	22.0	10.0	13.0	14.0	8.0	5.0	5.0	8.0
02043F	Conduct.(field)	mS/cm					0.02	0	0.04	0.04	0.08	0.00	0.00	0.00	0.00	0	0.05	0.01
02042F	Conduct.(field)	uS/cm	90	110	78	49												
17300F	Salinity (field)	%	0.05	0.06	0.00	0.00	0.02	0.01										
10300F	pH (field)		5.93	6.83	6.13	6.15	6.11	7.05	-	5.14	5.75	6.82	5.64	6.82	5.96	6.90	6.84	5.80
08102F	DO (field)	mg/l	7.30	1.9	6.6	7.7	4.8	7.9	3.9	6.9	7.7	8.5	7.4	8.5	6.5	7.9	-	-
06600L	Cyanide	mg CN/l	<0.010	-	<0.010	<0.010	0.020	<0.010	<0.010	<0.010	<0.010	0.004	<0.001	0.010	0.040	0.003		*
08202L	BOD (total)	mg/l	<2	4	2.8	<2	<2.0	1.6	<2.0	<2.0	<2.0	2.8	1.2	3.2	3.2	1.6	4	12
08205L	Dissolved BOD	mg/l	<2		<2.0	<2												
08301L	COD (total)	mg/l	17	9.8	20	10	20	15	<10	15	14	100	9	14	10	28	16	17
08303L	Dissolved COD	mg/l	-		15	10												
06534L	Phenol	mg/l	<0.001	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001	0.001	0.030	0.007	<0.001	0.002	0.002	<0.001	0.005	0.001
15408L	Total Phosphorus	mg P/l	0.10	0.09	0.20	0.08	0.06	0.08	0.07	0.20	0.15	0.09	0.08	0.12	0.14	0.13		*
15406L	Diss. Phosphorus	mg P/l	0.05	0.03	0.07	0.04												
15252L	Orthophoshate	mg P/l	0.04	0.02	0.04	0.02	0.01			0.20	0.02	0.05	0.04	0.06	0.04	0.05	0.06	0.62
	Organic Phosph	mg P/l	0.06	0.07	0.16	0.06	0.05			0.00	0.13	0.04	0.04	0.07	0.10	0.08		
07556L	Ammonia Nitrogen	mg N/l	0.15	0.30	0.06	0.04	0.06		0.07	0.02	0.03	0.05	0.13	0.08	0.11	0.14	0.13	3.63
07306L	Nitrate Nitrogen	mg N/l	0.30	0.50	0.40	0.30	0.25		0.20	0.15	0.10	0.506	0.401	0.456	0.536	0.356	0.341	0.22
07209L	Nitrite Nitrogen	mg N/l	0.020	0.020	0.030	0.007	0.008		0.006	0.020	0.007	0.018	0.015	0.032	0.024	0.010	0.011	0.210
07008L	Kjeldahl Nitrogen	mg N/l	0.30	0.60	1.10	0.50	0.45	0.20	0.60	0.15	0.60	0.66	0.68	0.90	0.35	1.48		*
07054L	Diss. Kjeldahl N.	mg N/l	0.20	0.40	1.10	0.50												
07407L	Organic Nitrogen	mg N/l	0.15	0.30	1.04	0.46	0.39		0.53	0.13	0.57	0.61	0.55	0.82	0.25	1.33		
07408L	Diss. Organic N.	mg N/l	0.05	0.10	1.04	0.46												
07801L	Total Nitrogen	mg N/l	0.620	1.120	1.530	0.807	0.708		0.806	0.320	0.707	1.19	1.10	1.38	0.91	1.84		
07802L	Diss. Nitrogen	mg N/l	0.520	0.920	1.530	0.807												
08402L	Total OC alcaline	mg/l	4.5	3.1	4.0	5.4	6.6	3.8	4.0	5.0	3.4	2.0	2.4	2.8	2.2	2.0	2.8	4.2
08403L	Diss. OC alcaline	mg/l	-		3.0	5.2												
08101L	DO	mg/l	6.8	6			7.6		-									
06522L	Hexan extractable	mg/l	20	6	<4	<4	10	<4	65									
10401L	Suspended Solids	mg/l	20		35	6	10	18	10	20	6	9	5	20	14	16	31	17
08305L	TOC	mg/l	*									7	<5		10	5	7	5
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	130		5	30	3	11	30	23	30	13	17	8	5	8	2300	3
36101L	Total Coli x1000	MPN/100ml	230		22	50	5	130	50	50	80	13	70	17	30	13	3000	16
48004L	Cadmium	mg Cd/l	0.000		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
82004L	Lead	mg Pb/l	<0.02		<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.05
29005L	Copper	mg Cu/l	<0.005		<0.005	0.050	0.020	<0.002	<0.005	-			<0.005	<0.005	<0.005	<0.005	<0.005	0.010
24101L	Chromium IV	mg Cu/l	<0.01		<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01		<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
80013L	Mercury	ug Hg/l	<0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.20	<0.10	<0.10	<0.10	<0.10	0.30	0.10	<0.10
30003L	Zinc	mg Zn/l	0.040		<0.005	0.005	0.015	<0.005	<0.005	0.005	0.005	0.060	0.020	0.030	0.015	0.015	0.010	0.010
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 13 (IR-540) RIVER NAME : Rio Iriri 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 07	JUN 23	AUG 27	SEP 30	OCT 22	NOV 24	FEB 10	MAR 31	APR 13	MAY 26	JUN 23	JUL 21	AUG 17	OCT20	NOV17	DEC05
General number of the laboratory			6386	6932	9215	10965	12238	13651	1589	4179	4941	7897	9222	11022	12505	15528	16681	17931
CODE	PARAMETER	UNITY																
	Time	H	13.30	11.10	9.55	10.25	15.40	10.40	11.40	13.30	13.15	11.05	11.00	11.45	10.30	10.35	9.00	10.25
02062F	Air temperature	C	32.00	27.50	24.00	28.00	22.00	27.00	34.00	29.00	34.50	26.00	25.00	29.00	24.50	27.00	28.00	30.00
02061F	Water temperature	C	25.56	20.50	19.80	21.60	22.59	24.81	30.00	26.00	25.24	20.92	17.78	20.56	19.45	27.03	27.81	28.76
02080F	Transp. (tube)	cm	>30.0	>30			11.0	10.0	0.75	16.00	17.00	9.0	13.0	10.0	8.0	15.0	5.0	8.0
02043F	Conduct. (field)	mS/cm					7.33	3.23	5.6	0.1	0.31	0.53	0.70	2.73	3.44	25.28	20.51	12.45
02042F	Conduct. (field)	uS/cm	640	700	11200	580												
17300F	Salinity (field)	%	0.32	0.38	6.50	0.30	4.23	1.64										
10300F	pH (field)		6.01	6.47	6.10	6.02	6.81	6.66	-	4.43	5.49	5.91	5.73	6.10	6.13	6.45	6.69	6.57
08102F	DO (field)	mg/l	0.80	0.5	2.7	1.7	0.4	0.8	1.6	2.1	0.7	1.5	1.3	2.1	6.7	2.7	-	-
06600L	Cyanide	mg CN/l	<0.010	-	<0.010	<0.010	<0.010	<0.010	0.020	<0.010	<0.010	0.008	<0.001	0.001	0.014	0.003		*
08202L	BOD (total)	mg/l	3	3.4	4	4	12	12	3.2	4	10	10	2	16	6.8	4	10	20
08205L	Dissolved BOD	mg/l	2		2	2												
08301L	COD (total)	mg/l	61	23.2	-	40	65	50	50	35	40	40	28	51	310	-	-	-
08303L	Dissolved COD	mg/l	-		-	40												
06534L	Phenol	mg/l	<0.001	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001	0.001	0.002	0.001	<0.001	0.001	0.001	0.002	0.003	<0.001
15408L	Total Phosphorus	mg P/l	0.35	0.20	0.25	0.20	0.45	0.30	0.30	0.30	0.20	0.26	0.18	0.22	0.40	0.23		*
15406L	Diss. Phosphorus	mg P/l	0.25	0.06	0.05	0.10												
15252L	Orthophoshate	mg P/l	0.20	0.03	0.03	0.08	0.10			0.25	0.10	0.14	0.11	0.09	0.07	0.02	0.04	1.60
	Organic Phosph	mg P/l	0.15	0.17	0.22	0.12	0.35			0.05	0.10	0.12	0.07	0.13	0.33	0.20		
07556L	Ammonia Nitrogen	mg N/l	0.15	1.20	0.95	0.06	1.85		0.60	<0.01	0.04	0.11	0.09	0.12	0.09	0.23	0.14	5.21
07306L	Nitrate Nitrogen	mg N/l	0.02	0.10	0.15	0.30	0.08		0.05	0.04	<0.01	0.033	0.035	0.066	0.064	0.139	0.084	0.04
07209L	Nitrite Nitrogen	mg N/l	0.010	0.010	0.040	0.010	0.030		0.006	0.003	0.040	0.010	0.010	0.038	0.049	0.046	0.015	0.004
07008L	Kjeldahl Nitrogen	mg N/l	1.40	1.80	1.10	0.60	4.20	0.60	1.40	0.40	0.60	0.82	0.76	0.84	1.54	1.03		*
07054L	Diss. Kjeldahl N.	mg N/l	0.50	1.80	1.10	0.60												
07407L	Organic Nitrogen	mg N/l	1.25	0.60	0.15	0.54	2.35		0.80	0.40	0.56	0.71	0.68	0.72	1.45	0.80		
07408L	Diss. Organic N.	mg N/l	0.35	0.60	0.15	0.54												
07801L	Total Nitrogen	mg N/l	1.430	1.910	1.290	0.910	4.310		1.456	0.443	0.604	0.86	0.81	0.95	1.65	1.22		
07802L	Diss. Nitrogen	mg N/l	0.530	1.910	1.290	0.910												
08402L	Total OC alcaline	mg/l	21.5	12.5	8.6	11.2	12.0	11.0	10.6	9.2	12.0	4.8	4.8	6.0	6.2	6.4	6.6	7.8
08403L	Diss. OC alcaline	mg/l	-		7.8	10.8												
08101L	DO	mg/l	1.6	1			1.6		-									
06522L	Hexan extractable	mg/l	13	<4	<4	<4	9	<4	4									
10401L	Suspended Solids	mg/l	10		10	8	15	10	10	6	5	6	6	9	31	34	30	30
08306L	TOC	mg/l	*									12	18		15	21	10	12
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	7		5	1.1	240	300	50	23	8	1600<	8	13	5	13	50	24
36101L	Total Coli x1000	MPN/100ml	50		23	3	300	300	80	30	30	1600<	11	13	13	30	80	50
48004L	Cadmium	mg Cd/l	0.000	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.055
82004L	Lead	mg Pb/l	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	0.20
29005L	Copper	mg Cu/l	0.010	0.010	<0.005	0.060	0.040	<0.002	0.015	-		<0.01	<0.005	<0.005	<0.005	0.005	<0.005	0.040
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.15	<0.10
30003L	Zinc	mg Zn/l	0.010	0.015	0.005	0.140	0.060	<0.005	<0.005	<0.005	0.010	0.005	0.015	0.050	0.010	0.015	0.005	0.100
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 14 (SR-500) RIVER NAME : Rio Surui 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 07	JUN 22	AUG 27	SEP 30	OCT 22	NOV 24	FEB 10	MAR 31	APR 13	MAY 26	JUN 23	JUL 21	AUG 17	OCT20	NOV17	DEC06
General number of the laboratory			6385	6926	9216	10964	12235	13652	1688	4180	4943	7898	9223	11023	12506	15529	16682	17932
CODE	PARAMETER	UNITY																
	Time	H	13.10	12.25	10.20	10.05	14.25	10.55	11.15	14.10	14.00	10.40	10.35	11.25	10.10	10.15	8.45	10.10
02062F	Air temperature	C	28.50	29.50	23.00	28.00	22.50	25.00	34.00	29.00	29.00	25.00	24.00	28.00	24.00	26.50	27.00	30.00
02061F	Water temperature	C	25.40	23.00	21.90	21.20	21.36	23.65	31.00	26.00	27.03	22.12	19.41	21.88	20.99	28.53	29.70	30.10
02060F	Transp.(tube)	cm	>30.0	>30			13.0	10.0	0.70	15.00	22.00	10.0	10.0	10.0	8.0	10.0	5.0	9.0
02043F	Conduct.(field)	mS/cm					1.06	0.47	1.29	0.09	0.16	0.55	0.20	0.45	0.59	14.96	21.59	7.91
02042F	Conduct.(field)	uS/cm	380	2910	1254	213												
17300F	Salinity (field)	%	0.17	1.54	0.70	0.10	0.64	0.22										
10300F	pH (field)		5.70	6.25	5.93	5.56	6.32	6.60	-	3.99	5.56	5.67	5.02	5.75	5.79	6.33	6.67	6.45
08102F	DO (field)	mg/l	2.90	1.7	7.8	4.7	5.7	4.2	2.9	4.9	4.5	4.0	3.5	4.6	4.5	2.2	-	-
06600L	Cyanide	mg CN/l	<0.010	<0.010	<0.010	<0.010	0.020	<0.010	0.020	<0.010	<0.010	0.006	0.002	0.004	0.006	0.006		*
08202L	BOD (total)	mg/l	3	6.4	5.6	<2	<2.0	2	5.2	3.2	2	8	1.6	2	3	16	22	12
08205L	Dissolved BOD	mg/l	2		<2.0	<2												
08301L	COD (total)	mg/l	52	15.6	30	15	20	15	30	15	16	60	16	19	27	-	-	-
08303L	Dissolved COD	mg/l	-		15	10												
06534L	Phenol	mg/l	<0.001	0.002	<0.010	<0.001	<0.001	<0.001	<0.001	0.002	0.006	0.007	<0.001	0.002	<0.001	0.001	0.002	0.001
15408L	Total Phosphorus	mg P/l	0.15	0.25	0.20	0.07	0.10	0.10	0.20	0.25	0.10	0.17	0.11	0.13	0.16	0.29		*
15406L	Diss. Phosphorus	mg P/l	0.04	0.04	0.03	0.03												
15252L	Orthophoshate	mg P/l	0.02	0.02	<0.01	0.01	0.03			0.20	0.03	0.03	0.04	0.02	0.02	0.01	0.04	0.84
	Organic Phosph	mg P/l	0.13	0.23	0.20	0.06	0.07			0.05	0.07	0.13	0.07	0.11	0.14	0.27		
07556L	Ammonia Nitrogen	mg N/l	0.30	0.25	0.01	0.20	0.20		0.20	0.03	0.05	0.06	0.13	0.11	0.13	0.18	0.01	2.95
07306L	Nitrate Nitrogen	mg N/l	0.10	0.30	0.10	0.04	0.45		0.20	0.10	0.10	0.116	0.249	0.200	0.218	0.601	0.024	6.77
07209L	Nitrite Nitrogen	mg N/l	0.030	0.009	0.006	0.005	0.007		0.005	0.020	0.004	0.019	0.005	0.006	0.006	0.014	0.002	0.974
07008L	Kjeldahl Nitrogen	mg N/l	0.80	0.60	1.20	0.55	1.00	0.25	0.80	0.25	0.50	1.16	0.86	0.69	0.58	1.55		*
07054L	Diss. Kjeldahl N.	mg N/l	0.30	0.60	0.50	0.55												
07407L	Organic Nitrogen	mg N/l	0.50	0.35	1.19	0.35	0.80		0.60	0.22	0.45	1.10	0.73	0.58	0.44	1.37		
07408L	Diss. Organic N.	mg N/l	0.00	0.35	0.49	0.35												
07801L	Total Nitrogen	mg N/l	0.930	0.909	1.306	0.595	1.457		1.005	0.370	0.604	1.29	1.11	0.89	0.80	2.17		
07802L	Diss. Nitrogen	mg N/l	0.430	0.909	0.606	0.595												
08402L	Total OC alcaline	mg/l	5.1	5.3	5.5	4.6	8.0	4.8	5.2	8.2	5.4	2.5	1.8	2.4	1.4	3.8	5.0	5.8
08403L	Diss. OC alcaline	mg/l	-		2.4	3.6												
08101L	DO	mg/l	8	4.6			4.8		-									
06522L	Hexan extractable	mg/l	<4	-	<4	13	8	<4	4									
10401L	Suspended Solids	mg/l	14		20	10	10	10	20	14	6	12	12	13	14	38	50	33
08306L	TOC	mg/l	*									<5	<5		<5	12	<5	10
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	23		80	24	80	300	13	130	30	900	130	50	23	8	5000	30
36101L	Total Coli x1000	MPN/100ml	30		1300	24	230	300	50	240	50	1600	1300	300	23	24	30000	30
48004L	Cadmium	mg Cd/l	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.030
82004L	Lead	mg Pb/l	<0.02	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.30	<0.02	<0.02	<0.02	<0.02	0.12	0.02	0.14
29005L	Copper	mg Cu/l	0.010	0.015	0.010	0.050	0.020	<0.002	<0.005	-			<0.005	<0.005	<0.005	<0.005	<0.005	0.040
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.25	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	0.10	<0.10
30003L	Zinc	mg Zn/l	<0.005	0.030	0.180	<0.005	0.010	<0.005	<0.005	<0.005	0.010	0.100	0.040	0.020	<0.005	0.015	0.010	0.030
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 15 (ES-400) RIVER NAME : Rio Estrela 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 07	JUN 22	AUG 25	SEP 30	OCT 21	NOV 20	FEB 11	MAR 31	APR 15	MAY 27	JUN 24	JUL 22	AUG 19	NOV03	DEC01	DEC16
General number of the laboratory			6382	6923	9089	10961	12046	13470	1782	4181	5303	7917	9326	11059	12686	16047	17557	18671
CODE	PARAMETER	UNITY																
	Time	H	10.55	10.00	10.55	8.55	15.50	15.05	13.55	15.10	13.55	10.25	10.10	9.45	9.25	10.00	8.55	9.05
02062F	Air temperature	C	33.00	28.00	29.00	25.00	22.00	33.00	36.50	29.00	32.00	30.00	23.00	26.00	21.00	24.50	28.00	30.00
02061F	Water temperature	C	25.25	25.00	22.90	22.10	26.70	27.16	33.00	25.70	27.45	24.19	20.98	22.80	21.89	26.59	28.38	29.68
02080F	Transp.(tube)	cm	24.0	28			20.0	14.0	0.50	7.00	18.00	14.0	10.0	12.0	5.0	8.0	13.0	5.0
02043F	Conduct.(field)	mS/cm					20.5	1.6	7.74	0.22	0.75	17.24	8.12	16.41	34.50	22.03	37.25	26.14
02042F	Conduct.(field)	uS/cm	830	17390	18650	535												
17300F	Salinity (field)	%	0.40	11.23	11.50	0.30	11.80	0.77										
10300F	pH (field)		6.40	6.30	6.38	6.21	6.85	6.66	-	4.75	5.98	6.43	6.61	5.45	6.57	6.67		6.60
08102F	DO (field)	mg/l	0.40	0.3	0.4	1.6	0.1	0.7	3.2	2.3	0.4	1.3	1.1	1.0	2.6	-	-	-
06600L	Cyanide	mg CN/l	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.040	0.020	<0.01	0.001	0.024	0.015	0.007	0.001		*
08202L	BOD (total)	mg/l	6	12	40	4	20	4	10	20	20	6	12	8	8	20	6	12
08205L	Dissolved BOD	mg/l	3		10	4												
08301L	COD (total)	mg/l	38	-	-	-	-	30	20	40	40	-	-	-	-	-	-	-
08303L	Dissolved COD	mg/l	-		-	-												
06534L	Phenol	mg/l	<0.001	0.020	<0.010	<0.001	0.004	<0.001	<0.001	<0.001	0.006	0.008	<0.001	0.008	0.006	0.007	0.002	0.004
15408L	Total Phosphorus	mg P/l	0.35	1.00	0.70	0.20	0.45	0.20	0.30	0.40	0.30	0.41	0.32	0.52	0.37	0.46		*
15406L	Diss. Phosphorus	mg P/l	0.08	0.40	0.25	0.06												
15252L	Orthophoshate	mg P/l	0.07	0.25	0.20	0.05	0.02			0.20	0.06	0.11	0.05	0.14	0.06	0.26	0.09	0.16
	Organic Phosph	mg P/l	0.28	0.75	0.50	0.15	0.43			0.20	0.24	0.30	0.27	0.38	0.31	0.21		
07556L	Ammonia Nitrogen	mg N/l	1.10	1.40	3.20	0.70	1.60		1.40	0.20	0.60	0.83	0.94	0.67	0.35	0.78	0.17	0.39
07306L	Nitrate Nitrogen	mg N/l	0.03	0.09	0.04	0.20	0.02		0.02	0.25	<0.01	0.075	0.057	0.007	0.108	0.023	0.030	0.01
07209L	Nitrite Nitrogen	mg N/l	0.010	0.004	0.003	0.020	0.002		0.005	0.030	0.002	0.024	0.033	0.002	0.071	0.007	0.010	0.011
07008L	Kjeldahl Nitrogen	mg N/l	2.80	4.00	4.00	1.10	2.40	1.40	1.60	0.80	2.00	2.72	3.21	3.54	1.59	2.02		*
07054L	Diss. Kjeldahl N.	mg N/l	1.60	3.00	4.00	1.10												
07407L	Organic Nitrogen	mg N/l	1.70	2.60	0.80	0.40	0.80		0.20	0.60	1.40	1.89	2.27	2.87	1.24	1.24		
07408L	Diss. Organic N.	mg N/l	0.50	1.60	0.80	0.40												
07801L	Total Nitrogen	mg N/l	2.840	4.094	4.043	1.320	2.422		1.625	1.080	2.002	2.82	3.30	3.55	1.77	2.05		
07802L	Diss. Nitrogen	mg N/l	1.640	3.094	4.043	1.320												
08402L	Total OC alcaline	mg/l	7.9	9.5	14.0	9.2	7.8	5.4	9.0	7.6	2.4	2.8	3.8	2.2	2.4	3.6	4.0	4.4
08403L	Diss. OC alcaline	mg/l	-		6.0	8.2												
08101L	DO	mg/l	1.8	0			0.8		-									
06522L	Hexan extractable	mg/l	14	<4	<4	9	5	<4	10									
10401L	Suspended Solids	mg/l	20	15	15	30	20	9	30	50	50	17	39	17	54	30	63	49
08306L	TOC	mg/l	*									12	9	8	6	17	8	18
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	230		70	50	30	-	1300	130	300	80	80	80	50	-	3	50
36101L	Total Coli x1000	MPN/100ml	300		-	160	80	-	2400	300	800	130	130	240	50	-	8	-
48004L	Cadmium	mg Cd/l	0.000	0.040	0.030	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.055	0.050
82004L	Lead	mg Pb/l	<0.02	0.20	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	0.02	<0.02	<0.02	0.18	0.40
29005L	Copper	mg Cu/l	0.010	0.060	0.050	0.060	0.060	<0.002	<0.005	-			0.005	<0.005	<0.005	0.005	0.030	0.040
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	0.10	<0.10	<0.10	<0.10	<0.10	0.10	0.25
30003L	Zinc	mg Zn/l	0.010	0.050	0.030	0.030	0.080	<0.005	<0.005	<0.005	0.050	0.020	0.020	0.010	0.010	0.015	0.060	0.050
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 16 (IN-460) RIVER NAME : Rio Inhomirim 1993 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 07	JUN 22	AUG 27	SEP 30	OCT 22	NOV 20	FEB 10	MAR 10	APR 13	MAY 26	JUN 23	JUL 21	AUG 17	OCT18		DEC06
General number of the laboratory			6384	6925	9217	10963	12234	13471	1687	2667	4944	7893	9225	11025	12508	15338		17933
CODE	PARAMETER	UNITY																
	Time	H	12.50	12.00	10.40	9.45	14.05	10.55	11.00	12.05	14.30	10.10	10.15	11.05	9.50	12.10	NO	9.50
02062F	Air temperature	C	29.00	28.00	23.00	28.00	22.50	32.00	33.00	31.00	32.00	24.00	23.00	26.00	24.00	33.00	SAMPLING	28.00
02061F	Water temperature	C	25.06	22.50	21.70	20.50	20.39	22.90	32.00	27.30	24.68	21.61	19.05	21.15	20.41	28.09		28.79
02080F	Transp.(tube)	cm	9.0	<30.0			11.0	6.0	0.60	10.00	17.00	15.0	5.0	10.0	9.0	2.5		8.0
02043F	Conduct.(field)	mS/cm					0.05	4.72	0.08	0.07	0.09	0.00	0.00	0.00	0.00	0		0
02042F	Conduct.(field)	uS/cm	110	140	102	64												
17300F	Salinity (field)	%	0.06	0.07	0.00	0.00	0.03	3.74										
10300F	pH (field)		5.95	6.61	5.75	5.65	6.17	7.21	-	4.58	5.77	5.89	5.18	5.58	5.61	6.03		5.12
08102F	DO (field)	mg/l	2.80	1.7	1.2	5.4	7.0	0.5	1.7	5.4	6.3	2.8	3.3	1.2	1.8	3.2		-
06600L	Cyanide	mg CN/l	<0.010	<0.010	<0.010	<0.010	0.020	<0.010	<0.010	<0.010	<0.010	0.007	0.008	0.006	0.005	0.004		*
08202L	BOD (total)	mg/l	2.4	2	4	<2	3.2	1.2	2.4	4	<2.0	30	4	4	2.4	5.6		10
08205L	Dissolved BOD	mg/l	<2		4	<2												
08301L	COD (total)	mg/l	13	9.2	20	15	30	<10	20	<10	10	30	13	16	12	8		30
08303L	Dissolved COD	mg/l	-		15	10												
06534L	Phenol	mg/l	<0.001	<0.001	<0.010	<0.010	<0.010	<0.001	<0.001	0.001	0.003	0.003	0.002	0.002	0.002	0.001		<0.001
15408L	Total Phosphorus	mg P/l	0.20	0.20	0.20	0.09	0.10	0.08	0.15	0.15	0.08	0.13	0.16	0.28	0.21	0.40		*
15406L	Diss. Phosphorus	mg P/l	0.02	0.03	0.06	0.04												
15252L	Orthophoshate	mg P/l	0.02	0.02	0.04	0.03	0.03			-	0.06	0.05	0.03	0.06	0.06	0.06		1.23
	Organic Phosph	mg P/l	0.18	0.18	0.16	0.06	0.07			-	0.02	0.09	0.13	0.22	0.16	0.34		
07556L	Ammonia Nitrogen	mg N/l	0.40	0.90	0.50	0.20	0.10		0.25	0.08	0.05	0.16	0.15	0.17	0.37	0.51		5.83
07306L	Nitrate Nitrogen	mg N/l	0.20	0.15	0.05	0.50	0.50		0.22	0.35	0.20	0.594	0.615	0.140	0.073	0.211		0.05
07209L	Nitrite Nitrogen	mg N/l	0.030	0.020	0.010	0.010	0.020		0.020	0.010	0.009	0.119	0.012	0.019	0.014	0.020		0.003
07008L	Kjeldahl Nitrogen	mg N/l	1.40	1.60	2.00	0.80	1.20	0.60	1.00	3.50	0.55	1.14	0.82	1.09	1.58	1.85		*
07054L	Diss. Kjeldahl N.	mg N/l	0.45	1.40	1.10	0.55												
07407L	Organic Nitrogen	mg N/l	1.00	0.70	1.50	0.60	1.10		0.75	3.42	0.50	0.98	0.66	0.92	1.21	1.34		
07408L	Diss. Organic N.	mg N/l	0.05	0.50	0.60	0.35												
07801L	Total Nitrogen	mg N/l	1.630	1.770	2.060	1.310	1.720		1.240	3.860	0.759	1.85	1.45	1.25	1.57	2.08		
07802L	Diss. Nitrogen	mg N/l	0.680	1.570	1.160	1.060												
08402L	Total OC alcaline	mg/l	3.1	3.3	4.8	4.0	6.4	2.2	3.0	4.0	2.4	3.2	3.8	3.2	1.8	3.0		3.4
08403L	Diss. OC alcaline	mg/l	-		3.2	4.0												
08101L	DO	mg/l	2.2	4.4			7		-									
06522L	Hexan extractable	mg/l	33	<4	<4	20	11	<4	4									
10401L	Suspended Solids	mg/l	50	6	6	13	20	5	10	25	16	<2	27	23	10	97		17
08306L	TOC	mg/l	*									<5	10		<5	<5		<5
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	80		1300	8	130	-	80	300	230	230	30	50	80	130		50
36101L	Total Coli x1000	MPN/100ml	230		2400	>160	230	-	130	800	300	1300	500	160<	800	240		160
48004L	Cadmium	mg Cd/l	0.000	0.040	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002
82004L	Lead	mg Pb/l	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.08		<0.02
29005L	Copper	mg Cu/l	0.010	0.010	<0.005	0.050	0.020	<0.002	<0.005	<0.005			0.005	0.030	<0.005	0.005		<0.005
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
80013L	Mercury	ug Hg/l	<0.10	0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.10		<0.10
30003L	Zinc	mg Zn/l	0.020	0.020	0.005	0.010	0.015	0.010	<0.005	0.005	0.080	0.015	0.020	0.020	0.020	0.040		0.005
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 17 (SC-420) RIVER NAME : Rio Saracuruna 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 07	JUN 22	AUG 27	SEP 30	OCT 21	NOV 20	FEB 10	MAR 10	APR 13	MAY 26	JUN 23	JUL 21	AUG 17	OCT18		DEC06
General number of the laboratory			6383	6924	9218	10962	12047	13469	1686	2666	4945	7894	9225	11024	12509	15337		17934
CODE	PARAMETER	UNITY																
	Time	H	12.10	11.25	10.55	9.30	17.10	10.25	10.30	11.50	14.55	9.35	9.40	10.40	9.20	11.40	NO	9.20
02062F	Air temperature	C	31.00	29.50	24.00	28.00	22.00	30.00	33.00	31.50	33.00	24.00	23.00	26.00	24.00	32.00	SAMPLING	29.00
02061F	Water temperature	C	25.13	22.50	22.30	21.60	23.70	24.19	31.00	27.00	25.59	21.89	19.91	21.04	20.35	27.52		27.66
02080F	Transp. (tube)	cm	30.0	>30			9.0	18.0	0.60	14.00	22.00	20.0	7.0	13.0	14.0	5.0		9.0
02043F	Conduct. (field)	mS/cm					0.23	0.05	0.25	0.22	0.16	0.24	0.53	0.83	0.25	0.02		0.05
02042F	Conduct. (field)	uS/cm	340	270	395	88												
17300F	Salinity (field)	%	0.17	0.14	0.20	0.00	0.12	0.03										
10300F	pH (field)		5.81	5.95	4.95	6.16	6.28	5.75	-	4.98	5.63	5.76	5.49	5.96	5.65	6.08		5.29
08102F	DO (field)	mg/l	1.50	0.7	0.5	6.6	1.4	7.3	1.6	4.6	5.2	0.8	1.9	1.6	2.3	2.3		-
06600L	Cyanide	mg CN/l	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.004	0.015	0.020	0.007	0.001		*
08202L	BOD (total)	mg/l	13	5	20	2.4	20	3	7.2	10	6.4	8	46		3.2	<2		30
08205L	Dissolved BOD	mg/l	9		8	2.4												
08301L	COD (total)	mg/l	38	17.5	40	6	30	15	25	10	35	40	85	44	14	11		30
08303L	Dissolved COD	mg/l	-		40	6												
06534L	Phenol	mg/l	<0.001	<0.001	<0.010	<0.001	0.004	0.001	<0.001	0.007	0.007	0.003	0.005	0.001	0.011	0.006		0.001
15408L	Total Phosphorus	mg P/l	0.20	0.10	0.10	0.09	0.20	0.08	0.15	0.06	0.070	0.06	0.09	0.17	0.08	0.19		*
15406L	Diss. Phosphorus	mg P/l	0.02	0.03	0.08	0.03					<0.01							
15252L	Orthophoshate	mg P/l	0.01	0.02	0.06	0.01	<0.01			-		0.01	0.01	0.12	0.01	0.05		1.30
	Organic Phosph	mg P/l	0.19	0.08	0.04	0.08	0.20			-	0.07	0.05	0.08	0.05	0.07	0.14		
07556L	Ammonia Nitrogen	mg N/l	0.75	0.95	1.30	0.30	1.30		0.55	0.25	0.15	0.16	0.22	0.01	0.37	0.45		6.77
07306L	Nitrate Nitrogen	mg N/l	0.25	0.20	0.06	0.40	0.75		0.20	0.20	0.25	0.063	0.275	0.022	0.191	0.117		0.07
07209L	Nitrite Nitrogen	mg N/l	0.030	0.003	0.010	0.010	0.060		0.030	0.050	0.020	0.003	0.024	0.000	0.023	0.014		0.009
07008L	Kjeldahl Nitrogen	mg N/l	2.20	2.00	2.20	1.00	2.20	1.00	1.40	4.00	1.00	1.93	2.22	1.44	1.14	1.85		*
07054L	Diss. Kjeldahl N.	mg N/l	1.60	2.00	2.00	0.55												
07407L	Organic Nitrogen	mg N/l	1.45	1.05	0.90	0.70	0.90		0.85	3.75	0.85	1.77	2.00	1.43	0.77	1.40		
07408L	Diss. Organic N.	mg N/l	0.85	1.05	0.70	0.25												
07801L	Total Nitrogen	mg N/l	2.480	2.203	2.270	1.410	3.010		1.630	4.250	1.270	2.00	2.52	1.46	1.36	1.98		
07802L	Diss. Nitrogen	mg N/l	1.880	2.203	2.070	0.960												
08402L	Total OC alcaline	mg/l	5.5	2.7	6.6	2.6	7.0	1.0	2.2	3.0	2.6	4.8	7.4	7.2	3.2	0.8		3.2
08403L	Diss. OC alcaline	mg/l	-		5.0	2.4												
08101L	DO	mg/l	0.6	0.2			0.8		-									
06522L	Hexan extractable	mg/l	25	<4	<4	12	7	<4	4									
10401L	Suspended Solids	mg/l	14	10	5	10	35	8	9	70	15	4	30	5	7	8		16
08306L	TOC	mg/l	*									12	13		5	9		8
08307L	Dissolved TOC	mg/l	*															
35111L	Fecal Coli x1000	MPN/100ml	80		110	30	50	-	50	80	50	8	50	13	3	50		9000
36101L	Total Coli x1000	MPN/100ml	230		110	50	130	-	130	230	110	13	80	22	80	50		16000
48004L	Cadmium	mg Cd/l	0.000	0.040	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002
82004L	Lead	mg Pb/l	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.10		<0.02
29005L	Copper	mg Cu/l	0.010	<0.005	<0.005	0.050	0.020	<0.002	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005		<0.005
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10		<0.10
30003L	Zinc	mg Zn/l	0.050	0.100	0.015	0.010	0.060	0.005	<0.005	0.010	0.070	0.020	0.030	0.030	0.020	0.040		0.015
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 18 (IA-260) RIVER NAME : Rio Iguacu 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 07	JUN 19	AUG 25	SEP 28	OCT 21	NOV 24	FEB 10	MAR 10	APR 15	MAY 25	JUN 23	JUL 22	AUG 17	OCT18	DEC02	
General number of the laboratory			6381	6922	9088	10854	12045	13653	1685	2665	5304	7810	9224	11020	12503	15336	17635	
CODE	PARAMETER	UNITY																
	Time	H	10.00	12.45	10.20	10.10	15.00	16.30	10.10	11.10	15.05	12.30	9.00	10.10	8.55	11.10	10.45	NO
02062F	Air temperature	C	27.00	23.00	25.00	25.00	22.00	25.00	32.00	32.00	32.00	26.00	21.00	25.00	22.00	33.00	27.00	SAMPLING
02061F	Water temperature	C	25.03	23.50	23.10	20.02	23.78	26.87	30.00	24.10	27.45	22.85	21.82	22.93	21.58	30.87	30.84	
02080F	Transp.(tube)	cm	23.0	>30			19.0	10.0	0.45	9.00	18.00	11.0	12.0	10.0	5.0	4.5	5.0	
02043F	Conduct.(field)	mS/cm					15.04	5.78	0.86	1.63	0.75	1.28	6.81	4.22	3.30	9.13	13.26	
02042F	Conduct.(field)	uS/cm	3140	1580	7310	525												
17300F	Salinity (field)	%	1.58	0.84	4.60	0.20	8.06	2.94										
10300F	pH (field)		6.68	6.59	6.38	6.08	6.91	6.94	-	5.75	5.98	6.47	6.22	6.54	6.36	6.47	6.34	
08102F	DO (field)	mg/l	0.30	0.3	0.8	3.0	0.2	0.6	1.1	3.3	0.4	0.1	0.8	0.4	1.1	0.1	-	
06600L	Cyanide	mg CN/l	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.025	<0.010	<0.010	0.010	0.015	0.012	0.022	0.003		
08202L	BOD (total)	mg/l	8	12	20	6	10	8	5.4	8	4	20	16	16	10	6	30	
08205L	Dissolved BOD	mg/l	2		10	4												
08301L	COD (total)	mg/l	45	15	-	40	-	40	65	25	30	60	208	68	74	83	577	
08303L	Dissolved COD	mg/l	-		-	20												
06534L	Phenol	mg/l	<0.001	0.030	<0.010	<0.001	0.003	<0.001	0.003	0.010	0.002	0.012	0.002	0.013	0.004	0.010	0.002	
15408L	Total Phosphorus	mg P/l	0.50	1.50	1.40	0.60	0.75	0.35	1.00	0.40	0.45	0.80	0.65	1.01	1.31	1.29		
15406L	Diss. Phosphorus	mg P/l	0.08	0.40	0.65	0.07												
15252L	Orthophoshate	mg P/l	0.05	0.30	0.60	0.04	0.25			-	0.10	0.32	0.19	0.41	0.47	0.64	0.46	
	Organic Phosph	mg P/l	0.45	1.20	0.80	0.56	0.50			-	0.35	0.48	0.47	0.60	0.84	0.65		
07556L	Ammonia Nitrogen	mg N/l	1.40	2.80	8.00	0.95	3.50		3.30	1.00	1.10	2.43	2.03	2.51	2.99	4.92	2.65	
07306L	Nitrate Nitrogen	mg N/l	0.02	0.15	0.04	0.70	0.02		0.03	<0.01	0.08	0.068	0.008	0.032	0.025	0.042	0.047	
07209L	Nitrite Nitrogen	mg N/l	0.010	0.004	0.003	0.090	0.002		0.001	0.003	0.060	0.002	0.002	0.004	0.002	0.008	0.002	
07008L	Kjeldahl Nitrogen	mg N/l	2.40	4.00	10.00	2.60	5.00	0.45	4.00	6.00	3.00	5.98	27.42	6.28	3.01	6.09		
07054L	Diss. Kjeldahl N.	mg N/l	2.00	3.50	9.00	1.80												
07407L	Organic Nitrogen	mg N/l	1.00	1.20	2.00	1.65	1.50		0.70	5.00	1.90	3.55	25.39	3.78	0.01	1.18		
07408L	Diss. Organic N.	mg N/l	0.60	0.70	1.00	0.85												
07801L	Total Nitrogen	mg N/l	2.430	4.154	10.043	3.390	5.022		4.031	6.003	3.140	6.05	27.43	6.32	3.04	6.14		
07802L	Diss. Nitrogen	mg N/l	2.030	3.654	9.043	2.590												
08402L	Total OC alcaline	mg/l	8.1	7.7	16.0	10.6	9.0	1.8	7.2	7.0	5.6	4.0	3.4	5.2	4.6	2.8	3.6	
08403L	Diss. OC alcaline	mg/l	-		8.0	8.0												
08101L	DO	mg/l	0	0			0.6		-									
06522L	Hexan extractable	mg/l	<4	<4	5	8	5	<4	14									
10401L	Suspended Solids	mg/l	30	15	15	100	20	30	20	25	30	10	16	28	28	32	40	
08306L	TOC	mg/l	*									<5	10		17	<5	<5	
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	2300		1100	>160	1300	270	1100	2300	500	3000	500	13000	1400	2400	300	
36101L	Total Coli x1000	MPN/100ml	3000		-	>160	2300	340	2100	2300	8000	9000	1700	160000	2200	2400	500	
48004L	Cadmium	mg Cd/l	0.010	0.008	0.012	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.030	
82004L	Lead	mg Pb/l	<0.02	0.06	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.25	0.18	
29005L	Copper	mg Cu/l	0.020	0.015	0.020	0.020	0.040	<0.002	0.030	0.015			<0.005	<0.005	<0.005	<0.005	0.030	
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	
30003L	Zinc	mg Zn/l	0.030	0.030	0.030	0.040	0.020	<0.005	<0.005	0.010	0.020	0.015	0.070	0.030	0.160	0.015	0.030	
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 19 (SP-300) RIVER NAME : Rio Sarapui 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 06	JUN 19	AUG 25	SEP 28	OCT 21	NOV 24	FEB 10	MAR 10	APR 14	MAY 25	JUN 21	JUL 21	AUG 17	OCT18	DEC02	
General number of the laboratory			6286	6917	9090		12044		1684	2664	5166	7809	8973	11019	12502	15335	17634	
CODE	PARAMETER	UNITY																
	Time	H	13.15	12.10	11.45	10.35	14.30	17.00	9.35	10.50	15.45	12.00	11.40	9.40	8.35	10.35	10.15	NO
02062F	Air temperature	C	26.00	25.00	27.00	26.00	23.00	25.00	32.00	31.00	32.00	26.00	25.00	25.00	22.00	33.00	27.00	SAMPLING
02061F	Water temperature	C	25.98	24.00	22.40		27.14	26.64	30.00	28.20	28.45	23.90	21.91	23.11	21.66	29.26	29.82	
02080F	Transp.(tube)	cm	12.0	13			11.0	5.0	0.5	5.0	2.5	5.0	6.0	4.0	4.0	2.0	5.0	
02043F	Conduct.(field)	mS/cm					4.07	1.42	0.1	0.66	0.75	0.59	0.49	0.64	0.58	1.57	2.97	
02042F	Conduct.(field)	uS/cm	660	740	360	415												
17300F	Salinity (field)	%	0.31	0.37	0.20	0.20	2.16	0.67										
10300F	pH (field)		6.94	6.89	6.75	6.56	6.94	7.13	-	5.88	6.46	6.33	6.31	6.79	6.35	6.78	6.58	
08102F	DO (field)	mg/l	0.30	0.3	0.2	3.4	0.3	0.3	1.0	0.4	0.3	0.1		0.5	1.4	0.3	-	
05600L	Cyanide	mg CN/l	<0.010	<0.010	0.020	0.010	0.020	<0.010	0.025	0.030	0.030	0.022	0.090	0.028	0.048	0.018		
08202L	BOD (total)	mg/l	24	35	40	20	30	16	18	20	30	40	30	40	22	20	20	
08205L	Dissolved BOD	mg/l	20		4	4												
08301L	COD (total)	mg/l	38	40	100	75	75	60	70	20	140	80	80	96	81	225	141	
08303L	Dissolved COD	mg/l	-		40	35												
06534L	Phenol	mg/l	0.010	0.009	0.009	0.010	0.010	0.008	0.010	0.020	0.008	0.019	0.080	0.026	0.022	0.022	0.014	
15408L	Total Phosphorus	mg P/l	2.00	3.50	1.60	1.20	1.70	2.00	3.10	2.10	2.20	1.51	1.50	2.52	2.32	2.06		
15406L	Diss. Phosphorus	mg P/l	1.00	3.00	0.90	0.50												
15252L	Orthophoshate	mg P/l	0.70	2.00	0.75	0.40	0.95			-	1.20	0.94	1.00	1.86	2.14	1.89	1.50	
	Organic Phosph	mg P/l	1.30	1.50	0.85	0.80	0.75			-	1.00	0.57	0.50	0.66	0.18	0.16		
07556L	Ammonia Nitrogen	mg N/l	2.50	3.50	9.00	2.00	9.00		4.00	4.00	4.50	5.39	5.00	5.12	5.44	4.58	5.60	
07306L	Nitrate Nitrogen	mg N/l	0.15	0.03	0.10	1.20	0.01		0.07	0.03	<0.01	0.047	0.030	0.045	0.025	0.053	0.040	
07209L	Nitrite Nitrogen	mg N/l	0.010	0.003	0.080	0.200	0.002		0.008	0.020	0.006	0.003	0.004	0.006	0.004	0.003	0.003	
07008L	Kjeldahl Nitrogen	mg N/l	20.00	24.00	10.00	9.00	10.00	11.80	19.00	15.00	16.00	17.14	10.00	16.29	12.83	14.00		
07054L	Diss. Kjeldahl N.	mg N/l	19.00	14.00	10.00	7.00												
07407L	Organic Nitrogen	mg N/l	17.50	20.50	1.00	7.00	1.00		6.00	11.00	11.50	11.75	5.00	11.17	7.39	9.42		
07408L	Diss. Organic N.	mg N/l	16.50	10.50	1.00	5.00												
07801L	Total Nitrogen	mg N/l	20.160	24.033	10.180	10.400	10.012		10.078	15.050	16.006	17.19	10.03	16.34	12.86	14.05		
07802L	Diss. Nitrogen	mg N/l	19.160	14.032	10.180	8.400												
08402L	Total OC alcaline	mg/l	9.3	10.3	20.0	10.4	9.6	9.2	10.4	9.5	20.0	30.0	4.8	7.2	5.6	5.4	5.8	
08403L	Diss. OC alcaline	mg/l	-		16.0	8.8												
08101L	DO	mg/l	0	0			0		-									
06522L	Hexan extractable	mg/l	16	-	<4	5	8	4	20									
10401L	Suspended Solids	mg/l	50	20	40	50	20	30	25	35	30	15	40	69	35	82	42	
08306L	TOC	mg/l	*									30	19		25	5	20	
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	24000		17000	>160	2300	3000	1100	13000	8000	3000	14000	90000	13000	24000	8000	
36101L	Total Coli x1000	MPN/100ml	50000		-	>160	8000	8000	1700	24000	13000	5000	22000	90000	50000	24000	13000	
48004L	Cadmium	mg Cd/l	0.000	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.008	
82004L	Lead	mg Pb/l	<0.02	0.06	<0.02	0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	
29005L	Copper	mg Cu/l	0.010	0.030	0.010	0.020	0.020	0.010	<0.005	0.010			0.010	0.010	<0.005	0.010	0.020	
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	0.10	0.04	0.08	<0.01	<0.01	<0.01	0.04	<0.01	0.06	0.06	0.08	0.12	0.06	0.14	<0.01	
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	0.20	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	0.10	
30003L	Zinc	mg Zn/l	0.040	0.040	0.040	0.060	0.020	<0.005	<0.005	0.180	0.070	0.020	0.030	0.040	0.060	0.090	0.030	
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.10												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 20 (SJ-220) RIVER NAME : Rio S. J. de Meriti 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 06	JUN 19	AUG 25	SEP 28	OCT 20	NOV 20	FEB 09	MAR 10	APR 14	MAY 25	JUN 21	JUL 21	AUG 17	OCT18	DEC06	
General number of the laboratory			6285	6921	9087		12006		1671	2663	5165	7808	8972	11018	12501	15334	17633	
CODE	PARAMETER	UNITY																
	Time	H	12.20	11.15	9.50	9.40	16.30	16.00	11.40	10.05	14.50	11.15	10.55	9.00	8.00	10.10	9.40	NO
02062F	Air temperature	C	28.00	23.00	23.00	25.00	29.00	35.00	33.50	30.00	32.00	25.50	24.00	23.00	20.00	31.00	27.00	SAMPLING
02061F	Water temperature	C	25.68	23.00	21.00		28.79	27.24	32.00	29.30	27.83	24.09	21.39	22.67	21.21	28.90	29.22	
02080F	Transp. (tube)	cm	12.0	19			9.0	9.0	0.3	7.0	8.0	5.0	5.0	4.0	2.5	4.0	5.0	
02043F	Conduct. (field)	mS/cm					5.48	0.37	3.03	5.9	3.07	3.55	3.11	4.89	1.58	6.48	7.07	
02042F	Conduct. (field)	uS/cm	4500	3750	7850	968												
17300F	Salinity (field)	%	0.56	2.04	4.50	0.20	2.71	0.18										
10300F	pH (field)		6.84	6.84	6.58	6.06	7.04	7.35	-	6.37	6.54	6.59	6.58	6.56	6.48	6.67	6.38	
08102F	DO (field)	mg/l	0.40	0.3	0.2	0.3	0.0	0.2	2.2	0.6	0.2	0.1		0.7	1.2	0.2	-	
06600L	Cyanide	mg CN/l	<0.010	<0.010	<0.010	<0.010	0.020	<0.010	<0.010	0.040	0.020	0.030	0.060	0.026	0.039	0.011		
08202L	BOD (total)	mg/l	20	38	40	16	10	16	12	40	30	50	40	68	50	20	50	
08205L	Dissolved BOD	mg/l	10		10	4												
08301L	COD (total)	mg/l	-	43	430	55	220	170	60	40	140	110	210	238	181	378	326	
08303L	Dissolved COD	mg/l	-		390	25												
06534L	Phenol	mg/l	0.010	0.030	0.020	<0.001	0.030	0.020	0.020	0.030	0.020	0.035	0.060	0.093	0.051	0.029	0.024	
15408L	Total Phosphorus	mg P/l	2.00	2.00	2.00	0.80	1.20	2.00	1.70	1.90	1.45	1.43	1.30	1.54	1.89	1.58		
15406L	Diss. Phosphorus	mg P/l	1.00	2.00	1.50	0.20												
15252L	Orthophoshate	mg P/l	0.70	2.00	1.50	0.20	0.80			-	1.10	1.12	1.05	1.24	1.20	1.66	1.40	
	Organic Phosph	mg P/l	1.30	0.00	0.50	0.60	0.40			-	0.35	0.31	0.25	0.30	0.69	0.02		
07556L	Ammonia Nitrogen	mg N/l	2.60	3.00	12.00	1.30	10.00		6.00	4.00	4.00	5.23	5.00	4.35	5.77	2.71	4.84	
07306L	Nitrate Nitrogen	mg N/l	0.06	0.09	0.03	2.50	0.04		0.02	<0.01	0.01	0.062	0.060	0.048	0.017	0.059	0.046	
07209L	Nitrite Nitrogen	mg N/l	0.010	0.006	0.003	0.400	0.002		0.010	0.010	0.005	0.006	0.005	0.003	0.002	0.002	0.002	
07008L	Kjeldahl Nitrogen	mg N/l	20.00	17.00	13.00	7.00	10.00	8.50	9.00	13.00	12.00	16.25	12.00	13.62	11.24	11.98		
07054L	Diss. Kjeldahl N.	mg N/l	20.00	7.00	12.00	5.00												
07407L	Organic Nitrogen	mg N/l	17.40	14.00	1.00	5.70	0.00		3.00	9.00	8.00	11.01	7.00	9.27	5.47	9.27		
07408L	Diss. Organic N.	mg N/l	17.40	4.00	0.00	3.70												
07801L	Total Nitrogen	mg N/l	20.070	17.096	13.033	9.900	10.042		9.030	13.010	12.015	16.31	12.07	13.67	11.26	12.04		
07802L	Diss. Nitrogen	mg N/l	20.070	7.096	12.033	7.900												
08402L	Total OC alcaline	mg/l	9.1	49.5	24.0	10.0	3.2	24.0	10.2	8.4	15.0	40.0	5.2	7.0	8.0	5.6	5.2	
08403L	Diss. OC alcaline	mg/l	-		20.0	8.0												
08101L	DO	mg/l	0	0			0		-									
06522L	Hexan extractable	mg/l	10	<4	9	15	5	<4	9									
10401L	Suspended Solids	mg/l	40	20	20	110	30	36	30	25	10	30	25	28	126	31	50	
08306L	TOC	mg/l	*									32	20		32	24	5	
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	5000		50000	>160	50000	-	8000	5000	22000	13000	9000	3000	24000	130000	50000	
36101L	Total Coli x1000	MPN/100ml	13000		-	>160	80000	-	24000	8000	28000	13000	14000	5000	50000	130000	90000	
48004L	Cadmium	mg Cd/l	0.010	0.014	0.016	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.018	
82004L	Lead	mg Pb/l	0.04	0.10	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.04	0.040	<0.02	0.12	
29005L	Copper	mg Cu/l	0.030	0.030	0.030	0.020	0.020	0.010	0.005	0.015			0.010	0.010	0.020	<0.005	0.020	
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	175.00	0.20	0.35	0.15	<0.10	0.25	0.35	0.10	0.10	
30003L	Zinc	mg Zn/l	0.040	0.100	0.100	0.040	0.060	0.010	<0.005	0.200	0.060	0.100	0.060	0.060	0.100	0.030	0.070	
18001L	pp' DDT	ug/l	<0.001		<0.001	<0.001												
18022L	op' DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp' DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp' DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 21 (AC-241) RIVER NAME : Rio Acari 1992 1992

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 08	JUN 19	AUG 25	SEP 28	OCT 20	NOV 20	FEB 09	MAR 09	APR 13	MAY 25	JUN 21	JUL 19	AUG 19	NOV03		DEC06
General number of the laboratory			6418	6918			12001		1672	2573	4946	7811	8974	10784	12687	16048		18672
CODE	PARAMETER	UNITY																
	Time	H	10.25	14.15	-	-	9.30	9.30	12.30	11.30	15.45	13.35	12.30	11.20	11.00	11.45	NO	10.20
02062F	Air temperature	C	28.00	24.00	-	-	30.00	32.00	34.50	30.50	32.00	25.00	26.00	28.00	21.00	25.00	SAMPLING	38.00
02061F	Water temperature	C	25.55	24.50	-		26.18	25.69	32.50	21.30	28.85	25.03	22.99	23.02	21.64	25.65		29.42
02080F	Transp.(tube)	cm	18.0	12			9.0	18.0	0.28	7.00	6.00	6.0	7.0	5.0	2.5	2.0		3.0
02043F	Conduct.(field)	mS/cm					0.36	0.19	0.37	0.44	0.46	0.27	0.30	0.24	0.24	0.28		0.34
02042F	Conduct.(field)	uS/cm	420	420	-	-												
17300F	Salinity (field)	%	0.20	0.21	-	-	0.17	0.09										
10300F	pH (field)		6.59	6.88	-	-	7.04	6.84	-	6.30	6.56	6.63	6.64	6.63	6.65	6.91		7.02
08102F	DO (field)	mg/l	2.30	0.3	-	-	0.0	7.0	1.8	2.2	0.1	0.0		0.2	0.4			-
06600L	Cyanide	mg CN/l	0.010	0.020	-	-	<0.010	<0.010	0.020	0.025	0.040	0.020	0.080	0.029	0.041	0.020		*
08202L	BOD (total)	mg/l	40	68	-	-	40	5	16	30	50	70	30	38	48	80		44
08205L	Dissolved BOD	mg/l	30		-	-												
08301L	COD (total)	mg/l	49	84	-	-	110	50	30	50	130	160	100	62	180	92		88
08303L	Dissolved COD	mg/l	-		-	-												
06534L	Phenol	mg/l	0.000	0.020	-	-	0.005	0.002	0.020	0.020	0.020	0.020	0.030	0.009	0.018	0.007		0.015
15408L	Total Phosphorus	mg P/l	2.00	3.00	-	-	1.65	1.50	1.70	1.80	2.35	1.62	1.50	1.23	1.51	1.35		
15406L	Diss. Phosphorus	mg P/l	1.00	2.00	-	-												
15252L	Orthophoshate	mg P/l	0.85	2.00	-	-	0.90			-	1.15	1.11	1.30	0.96	1.07	1.05		0.95
	Organic Phosph	mg P/l	1.15	1.00	-	-	0.75			-	1.20	0.52	0.20	0.27	0.44	0.29		
07556L	Ammonia Nitrogen	mg N/l	8.00	3.00	-	-	9.00		6.00	4.90	3.25	5.10	4.00	3.44	3.11	4.75		1.71
07306L	Nitrate Nitrogen	mg N/l	0.02	0.20	-	-	0.04		0.02	0.03	0.01	0.059	0.040	0.057	0.013	0.029		0.11
07209L	Nitrite Nitrogen	mg N/l	0.010	0.005	-	-	0.002		0.009	0.030	0.020	0.002	0.006	0.012	0.004	0.003		0.002
07008L	Kjeldahl Nitrogen	mg N/l	9.00	18.00	-	-	11.00	8.50	10.00	8.00	10.00	17.16	10.00	12.67	7.66	13.31		
07054L	Diss. Kjeldahl N.	mg N/l	8.00	7.00	-	-												
07407L	Organic Nitrogen	mg N/l	1.00	15.00	-	-	2.00		4.00	4.00	6.75	12.06	6.00	9.23	4.55	8.56		
07408L	Diss. Organic N.	mg N/l	0.00	4.00	-	-												
07801L	Total Nitrogen	mg N/l	9.030	18.205	-	-	11.042		10.029	8.060	10.030	17.22	10.05	12.74	7.68	13.34		
07802L	Diss. Nitrogen	mg N/l	8.030	7.205	-	-												
08402L	Total CC alcaline	mg/l	9.1	21.5	-	-	11.2	1.0	10.4	7.0	19.5	26.0	4.2	5.8	5.6	4.4		7.0
08403L	Diss. CC alcaline	mg/l	-		-	-												
08101L	DO	mg/l	0.8	0			0.6		-									
06522L	Hexan extractable	mg/l	18	15	-	-	8	<4	4									
10401L	Suspended Solids	mg/l	60	60	-	-	60	28	70	20	50	65	30	55	58	80		39
08306L	TOC	mg/l	*									34	21	12	<5	32		30
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	24000		-	-	13000	-	24000	5000	17000	24000	11000	2300	30000	-		160000
36101L	Total Coli x1000	MPN/100ml	50000		-	-	23000	-	30000	G16000	30000	30000	17000	3000	30000	-		-
48004L	Cadmium	mg Cd/l	0.000	0.004	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002
82004L	Lead	mg Pb/l	<0.02	0.08	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04		<0.02
29005L	Copper	mg Cu/l	0.010	0.030	-	-	0.010	0.010	0.005	0.005			0.020	0.015	0.015	0.015		<0.005
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	-	-	<0.01											
24002L	Chromium	mg Cr/l	<0.01	0.02	-	-	<0.01	<0.01	<0.01	<0.01	0.06	0.01	0.06	<0.01	<0.01	<0.01		0.16
80013L	Mercury	ug Hg/l	<0.10	0.25	-	-	0.1	<0.10	0.45	0.20	0.70	<0.10	<0.10	0.15	0.15	0.25		0.20
30003L	Zinc	mg Zn/l	0.030	0.120	-	-	0.040	0.035	<0.005	0.060	0.140	0.040	0.080	0.080	0.080	0.090		0.100
18001L	pp'DDT	ug/l	<0.001		-	-												
18022L	op'DDE	ug/l	<0.001		-	-												
18023L	pp'DDE	ug/l	<0.001		-	-												
18013L	pp'DDD	ug/l	<0.001		-	-												
18170L	PCB's	ug/l	<0.01		-	-												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 22 (IJ-200) RIVER NAME : Rio Iraja 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 06	JUN. 19	AUG 25	SEP 28	OCT 21	NOV 24	FEB 09	MAR 09	APR 14	MAY 25	JUN 21	JUL 19	AUG 16	OCT18	DEC02	
General number of the laboratory			6284	6915	9086		12005		1670	2572	5164	7807	8971	10782	12446	15333	17632	
CODE	PARAMETER	UNITY																
	Time	H	11.45	10.45	9.30	9.25	16.00	16.45	11.15	11.00	14.20	10.45	10.30	10.40	9.30	9.40	9.20	NO
02062F	Air temperature	C	26.00	20.00	25.00	26.00	29.50	31.00	33.00	30.50	33.00	25.00	23.00	25.00	23.00	29.50	27.00	SAMPLING
02061F	Water temperature	C	27.01	25.00	21.40		29.68	27.15	32.00	31.30	29.79	25.22	23.27	23.78	22.94	26.62	27.64	
02080F	Transp.(tube)	cm	7.0	12			8.0	5.0	0.30	6.00	3.50	5.0	5.0	4.0	2.5	2.0	5.0	
02043F	Conduct.(field)	mS/cm					3.12	2.63	1.09	1.11	5.04	1.27	2.89	0.97	0.88	4.11	6.46	
02042F	Conduct.(field)	uS/cm	1860	1860	3120	806												
17300F	Salinity (field)	%	0.81	0.96	2.50	0.50	1.32	1.15										
10300F	pH (field)		6.38	6.94	6.65	6.80	6.93	7.20	-	6.50	6.45	6.63	6.73	6.91	6.79	6.69	6.42	
08102F	DO (field)	mg/l	0.30	0.3	1.1	1.1	0.0	0.2	0.9	0.6	0.2	0.2		0.2	0.5	0.2	-	
06600L	Cyanide	mg CN/l	0.030	0.010	0.010	<0.010	0.020	<0.010	<0.010	0.040	0.040	0.021	0.070	0.029	0.095	0.018		
08202L	BOD (total)	mg/l	90	65	30	20	60	64	16	40	65	80	110	140	150	20	50	
08205L	Dissolved BOD	mg/l	50		10	10												
08301L	COD (total)	mg/l	90	74	90	60	210	120	70	40	190	200	400	268	456	252	266	
08303L	Dissolved COD	mg/l	-		80	30												
06534L	Phenol	mg/l	0.020	0.010	0.007	0.002	0.020	0.030	0.030	0.040	0.045	0.021	0.060	0.025	0.022	0.012	0.012	
15408L	Total Phosphorus	mg P/l	3.00	3.00	1.20	1.00	2.15	2.00	2.20	2.30	1.80	1.80	1.60	2.11	1.94	1.07		
15406L	Diss. Phosphorus	mg P/l	2.00	2.00	0.60	0.60												
15252L	Orthophoshate	mg P/l	1.80	2.00	0.60	0.50	1.90			-	1.20	1.17	1.50	1.55	1.31	0.98	0.71	
	Organic Phosph	mg P/l	1.20	1.00	0.60	0.50	0.25			-	0.60	0.63	0.10	0.56	0.63	0.09		
07556L	Ammonia Nitrogen	mg N/l	2.50	3.40	7.00	2.30	12.00		8.00	6.00	5.00	6.96	6.00	4.96	7.67	1.67	3.01	
07306L	Nitrate Nitrogen	mg N/l	0.10	0.03	0.40	0.80	0.05		<0.01	0.06	<0.01	0.050	0.010	0.065	0.041	0.039	0.031	
07209L	Nitrite Nitrogen	mg N/l	0.010	0.010	0.060	0.200	0.002		0.009	0.060	0.006	0.003	0.006	0.004	0.002	0.004	0.001	
07008L	Kjeldahl Nitrogen	mg N/l	24.00	21.00	10.00	7.00	14.00	15.00	14.00	9.00	9.00	24.15	11.00	23.54	29.36	8.88		
07054L	Diss. Kjeldahl N.	mg N/l	20.00	4.00	8.00	6.00												
07407L	Organic Nitrogen	mg N/l	21.50	17.60	3.00	4.70	2.00		6.00	3.00	4.00	17.19	5.00	18.58	21.69	7.21		
07408L	Diss. Organic N.	mg N/l	17.50	0.60	1.00	3.70												
07801L	Total Nitrogen	mg N/l	24.110	21.040	10.460	8.000	14.052		14.009	9.120	9.006	24.20	11.02	23.61	29.40	8.92		
07802L	Diss. Nitrogen	mg N/l	20.110	4.040	8.460	7.000												
08402L	Total OC alcaline	mg/l	21.2	19.5	26.0	10.0	1.6	10.8	11.2		22.0	80.0	5.8	7.0	6.4	1.4	5.4	
08403L	Diss. OC alcaline	mg/l	-		20.0	7.4												
08101L	DO	mg/l	0	0			0	0	-									
06522L	Hexan extractable	mg/l	27	35	7	19	8	5	8									
10401L	Suspended Solids	mg/l	100	35	25	30	35	40	30	30	30	40	30	213	213	55	30	
08306L	TOC	mg/l	*									43	51	26	<5	<5	10	
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	24000		2300	>160	130000	50000	90000	G16000	5000	50000	17000	8000	13000	13000	14000	
36101L	Total Coli x1000	MPN/100ml	30000		-	>160	230000	160000	160000	G16000	9000	90000	17000	24000	24000	13000	14000	
48004L	Cadmium	mg Cd/l	0.010	0.016	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.008	0.006	<0.002	<0.002	<0.002	0.014	
82004L	Lead	mg Pb/l	0.04	0.06	0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.10	
29005L	Copper	mg Cu/l	0.030	0.015	0.015	0.015	0.020	0.010	0.005	0.005			0.015	0.015	0.020	0.030	0.015	
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.01	<0.01	<0.01	0.02	<0.01	
80013L	Mercury	ug Hg/l	0.15	0.15	<0.10	<0.10	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.15	0.35	0.50	0.10	
30003L	Zinc	mg Zn/l	0.090	0.070	0.060	0.040	0.060	0.02	<0.005	0.080	0.060	0.100	0.140	0.080	0.090	0.080	0.080	
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.001												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 23 (PN-180) RIVER NAME : Canal do Penha 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 06	JUN 19	AUG 25	SEP 28	OCT 20	NOV 24	FEB 09	MAR 09	APR 14	MAY 27	JUN 21	JUL 19	AUG 16	OCT18	DEC02	
General number of the laboratory			6283	6919	9085		12004		1669	2571	5163	7918	8970	10782	12445	15332	17631	
CODE	PARAMETER	UNITY																
	Time	H	11.10	10.15	9.15	9.10	15.30	14.45	10.55	10.40	14.05	9.10	10.00	10.15	9.15	9.20	9.10	NO
02062F	Air temperature	C	29.00	22.00	25.00	25.00	32.00	28.50	33.00	30.50	33.00	25.00	23.50	25.00	23.00	29.00	26.00	SAMPLING
02061F	Water temperature	C	26.83	24.50	21.40		27.66	27.24	31.00	30.40	28.59	24.70	22.66	23.65	22.33	27.30	28.29	
02080F	Transp. (tube)	cm	11.0	15			8.0	8.0	0.25	9.00	4.00	6.0	5.0	2.5	2.5	2.0	5.0	
02043F	Conduct. (field)	mS/cm					5.38	2.39	0.68	1.61	3.8	11.06	2.98	1.56	4.87	4.48	3.5	
02042F	Conduct. (field)	uS/cm	6320	5390	14300	622												
17300F	Salinity (field)	%	3.31	2.96	8.50	0.30	2.73	1.16										
10300F	pH (field)		6.97	6.74	6.19	6.45	7.04	7.10	-	6.70	6.40	6.52	6.68	6.81	6.57	6.64	6.44	
08102F	DO (field)	mg/l	0.30	0.4	0.3	0.3	0.3	0.2	1.1	0.6	0.2	0.3		0.3	0.6	0.3	-	
06600L	Cyanide	mg CN/l	0.020	0.010	<0.010	<0.010	0.015	0.010	0.015	0.035	0.060	0.028	0.065	0.072	0.064	0.013		
08202L	BOD (total)	mg/l	40	117	30	12	70	44	12	50	70	52	60	440	360	60	50	
08205L	Dissolved BOD	mg/l	40		25	4												
08301L	COD (total)	mg/l	54	159	-	60	320	90	20	60	210	110	270	1427	860	396	237	
08303L	Dissolved COD	mg/l	-		-	30												
06534L	Phenol	mg/l	0.010	0.020	0.003	0.002	0.030	0.020	0.010	0.030	0.030	0.013	0.030	0.022	0.017	0.029	0.027	
15408L	Total Phosphorus	mg P/l	3.00	3.00	1.30	0.80	3.45	2.00	2.40	2.70	2.00	1.38	1.60	3.87	2.52	1.78		
15406L	Diss. Phosphorus	mg P/l	2.00	2.00	0.90	0.30												
15252L	Orthophoshate	mg P/l	1.70	2.00	0.80	0.25	2.50			-	1.35	0.80	1.50	1.74	2.04	1.69	1.66	
	Organic Phosph	mg P/l	1.30	1.00	0.50	0.55	0.95			-	0.65	0.58	0.10	2.13	0.48	0.09		
07556L	Amonia Nitrogen	mg N/l	2.80	3.30	8.00	2.30	16.00		8.00	6.00	7.00	4.41	3.15	5.55	6.79	3.88	4.72	
07306L	Nitrate Nitrogen	mg N/l	0.09	0.04	0.20	1.80	0.04		<0.01	0.02	<0.01	0.046	<0.01	0.026	0.026	0.051	0.045	
07209L	Nitrite Nitrogen	mg N/l	0.010	0.004	0.020	0.800	0.002		0.010	0.020	0.010	0.002	0.006	0.014	0.003	0.003	0.002	
07008L	Kjeldahl Nitrogen	mg N/l	22.00	19.00	10.00	7.00	21.00	18.00	13.00	7.00	12.00	12.38	15.00	22.05	45.44	9.39		
07054L	Diss. Kjeldahl N.	mg N/l	21.00	10.00	9.00	6.00												
07407L	Organic Nitrogen	mg N/l	19.20	15.70	2.00	4.70	5.00		5.00	1.00	5.00	7.96	11.85	16.50	38.65	5.51		
07408L	Diss. Organic N.	mg N/l	18.20	6.70	1.00	3.70												
07801L	Total Nitrogen	mg N/l	22.100	19.044	10.220	9.600	21.042		13.010	7.040	12.010	12.42	15.01	22.09	45.47	9.45		
07802L	Diss. Nitrogen	mg N/l	21.100	10.044	9.220	8.600												
08402L	Total OC alcaline	mg/l	10.0	28.5	28.0	10.4	5.6	10.4	10.6		22.0	5.2	5.6	14.0	13.5	6.7	6.4	
08403L	Diss. OC alcaline	mg/l	-		26.0	7.8												
08101L	DO	mg/l	0	0			0	0	-									
06522L	Hexan extractable	mg/l	25	<4	7	20	9	<4	10									
10401L	Suspended Solids	mg/l	38	30	25	30	35	50	20	16	25	20	75	1126	739	103	58	
08306L	TOC	mg/l	*									21	44	44	76	40	31	
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	5000		50000	>160	230000	50000	50000	9000	24000	2300	30000	30000	24000	30000	30000	
36101L	Total Coli x1000	MPN/100ml	13000		-	>160	300000	90000	90000	G16000	9000	160000	30000	50000	24000	30000	30000	
48004L	Cadmium	mg Cd/l	0.010	0.014	0.025	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	0.008	
82004L	Lead	mg Pb/l	0.06	0.10	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.06	0.04	<0.02	0.10	
29005L	Copper	mg Cu/l	0.080	0.040	0.040	0.010	0.060	0.010	0.040	0.040			0.040	0.160	0.120	<0.005	0.020	
24101L	Chromium IV	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	0.18	0.04	0.10	0.13	<0.01	<0.01	
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	0.15	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	0.80	0.60	<0.10	0.10	
30003L	Zinc	mg Zn/l	0.080	0.070	0.120	0.020	0.080	0.020	<0.005	0.070	0.100	0.040	0.090	0.500	0.350	0.020	0.080	
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.001												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 24 (CN-100) RIVER NAME : Canal do Cunha 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 06	JUN 19	AUG 25	SEP 28	OCT 20	NOV 24	FEB 09	MAR 09	APR 14	MAY 25	JUN 21	JUL 19	AUG 16	OCT20	DEC02	
General number of the laboratory			6282	6920	9084		12003		1668	2570	5162	7806	8969	10781	12444	15525	17630	
CODE	PARAMETER	UNITY																
	Time	H	10.20	9.20	8.50	8.50	14.45	14.45	10.15	10.05	11.30	10.00	9.15	9.35	8.50	8.40	8.45	NO
02062F	Air temperature	C	31.00	22.00	23.00	24.00	29.50	28.50	33.50	30.50	32.50	25.00	21.00	23.00	23.00	26.00	27.00	SAMPLING
02061F	Water temperature	C	26.00	22.50	20.40		28.91	27.24	29.90	29.10	27.31	24.00	21.45	22.45	21.09	26.17	28.05	
02080F	Transp.(tube)	cm	13.0	19			7.0	8.0	0.30	11.00	3.00	4.0	5.0	4.0	2.5	5.0	5.0	
02043F	Conduct.(field)	mS/cm					0.92	2.39	1.79	1.1	0.84	1.17	4.78	1.36	1.19	1.47	1.09	
02042F	Conduct.(field)	uS/cm	860	1390	1620	768												
17300F	Salinity (field)	%	0.45	0.69	0.90	0.50	0.46	1.16										
10300F	pH (field)		6.68	6.80	6.45	6.52	6.94	7.10	-	6.40	6.32	6.27	6.34	6.50	6.36	6.34	6.24	
08102F	DO (field)	mg/l	0.20	0.4	0.3	2.0	0.4	0.2	1.5	0.2	0.3	0.2		0.3	1.0	0.7	-	
06600L	Cyanide	mg CN/l	0.010	<0.010	<0.010	<0.010	0.015	0.010	0.015	0.020	0.030	0.025	0.025	0.029	0.045	0.020		
08202L	BOD (total)	mg/l	50	53	25	14	80	44	20	45	120	50	25	56	56	40	44	
08205L	Dissolved BOD	mg/l	30		10	-												
08301L	COD (total)	mg/l	56	57	100	60	180	90	50	45	250	140	250	223	146	50	170	
08303L	Dissolved COD	mg/l	-		70	30												
06534L	Phenol	mg/l	0.010	0.020	0.007	0.007	0.030	0.020	0.020	0.020	0.030	0.030	0.040	0.014	0.015	0.026	0.022	
15408L	Total Phosphorus	mg P/l	3.00	2.00	1.10	0.70	2.00	2.00	2.00	1.90	1.70	1.47	1.30	1.31	1.41	1.58		
15406L	Diss. Phosphorus	mg P/l	1.50	1.00	0.35	0.10												
15252L	Orthophoshate	mg P/l	1.30	0.75	0.30	0.09	1.65			-	0.55	0.95	0.60	0.89	1.10	0.60	1.87	
	Organic Phosph	mg P/l	1.70	1.25	0.80	0.61	0.35			-	1.15	0.52	0.70	0.42	0.32	0.98		
07556L	Ammonia Nitrogen	mg N/l	2.40	3.00	6.00	2.40	15.00		8.00	3.50	4.00	4.34	3.25	2.98	3.91	3.49	3.47	
07306L	Nitrate Nitrogen	mg N/l	0.09	0.06	0.10	1.50	0.03		0.02	0.03	0.01	0.050	0.040	0.031	0.019	0.024	0.009	
07209L	Nitrite Nitrogen	mg N/l	0.010	0.004	0.400	0.300	0.003		0.020	0.030	0.040	0.009	0.003	0.008	0.001	0.002	0.004	
07008L	Kjeldahl Nitrogen	mg N/l	16.00	14.00	10.00	7.00	17.00	18.00	10.00	5.00	17.00	15.25	8.00	12.92	12.83	8.18		
07054L	Diss. Kjeldahl N.	mg N/l	16.00	5.00	7.00	6.00												
07407L	Organic Nitrogen	mg N/l	13.60	11.00	4.00	4.60	2.00		2.00	1.50	13.00	10.91	4.75	9.94	8.92	4.69		
07408L	Diss. Organic N.	mg N/l	13.60	2.00	1.00	3.60												
07801L	Total Nitrogen	mg N/l	16.100	14.064	10.500	8.800	17.033		10.040	5.060	17.014	15.31	8.04	12.96	12.85	8.21		
07802L	Diss. Nitrogen	mg N/l	16.100	5.064	7.500	7.800												
08402L	Total OC alcaline	mg/l	9.7	10.5	20.0	9.8	4.6	10.4	10.0	3.6	27.0	30.0	5.2	6.4	6.0	6.6	5.8	
08403L	Diss. OC alcaline	mg/l	-		16.0	6.8												
08101L	DO	mg/l	1	0			0	0	-									
06522L	Hexan extractable	mg/l	36	13	4	4	7	<4	5									
10401L	Suspended Solids	mg/l	60	45	25	65	35	50	14	20	110	90	50	97	100	54	52	
08306L	TOC	mg/l	*									19	18	37	28	37	32	
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	3000		160000	>160	80000	50000	11000	G16000	30000	50000	90000	5000	13000	80000	30000	
36101L	Total Coli x1000	MPN/100ml	13000		-	>160	130000	90000	30000	G16000	3000	90000	90000	8000	13000	130000	30000	
48004L	Cadmium	mg Cd/l	<0.002	0.006	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	
82004L	Lead	mg Pb/l	<0.02	0.08	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.04	0.05	
29005L	Copper	mg Cu/l	0.020	0.040	0.015	0.015	0.060	0.010	0.010	0.005			0.020	0.030	0.040	0.020	0.020	
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	
80013L	Mercury	ug Hg/l	<0.10	0.15	<0.10	<0.10	0.1	<0.10	<0.10	0.20	0.10	<0.10	<0.10	0.15	0.10	0.10	0.10	
30003L	Zinc	mg Zn/l	0.050	0.100	0.050	0.040	0.100	0.020	<0.005	0.060	0.050	0.050	0.030	0.100	0.090	0.080	0.060	
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.001												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

Table APP. 1-4 Results of River Water Quality Analysis of Regular Survey

NO. OF STATION : 25 (MN-000) RIVER NAME : Canal de Mangue 1992 1993

NO. OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DATE OF SAMPLING			MAY 06	JUN 19	AUG 25	SEP 28	OCT 19	NOV 20	FEB 09	MAR 09	APR 14	MAY 25	JUN 21	JUL 19	AUG 16	OCT18	DEC02	
General number of the laboratory			6281	6916	9083		11975		1667	2569	5161	7805	8968	10780	12443	15331	17629	
CODE	PARAMETER	UNITY																
	Time	H	9.40	8.35	8.20	8.20	16.12	17.15	9.25	9.30	11.00	9.00	8.30	8.40	8.20	8.30	8.20	NO
02062F	Air temperature	C	27.00	22.00	21.00	24.00	28.00	31.00	32.00	30.50	31.50	24.00	21.00	23.00	20.00	27.50	25.00	SAMPLING
02061F	Water temperature	C	26.13	23.50	21.50		26.27	27.58	29.70	28.30	26.97	24.16	21.95	22.47	21.87	25.58	27.25	
02080F	Transp.(tube)	cm	11.0	15			6.0	6.0	0.20	13.20	6.00	5.0	5.0	5.0	2.5	2.0	10.0	
02043F	Conduct.(field)	mS/cm					1.66	2.18	2.67	2.27	1.42	2.67	5.93	5.18	4.84	2.48	3.23	
02042F	Conduct.(field)	uS/cm	3140	3370	2320	2950												
17300F	Salinity (field)	%	1.61	1.82	1.00	1.70	0.82	1.09										
10300F	pH (field)		6.65	6.59	6.23	6.32	6.89	7.15	-	6.80	6.41	6.51	6.48	6.64	6.40	6.55	6.54	
08102F	DO (field)	mg/l	0.60	0.5	0.5	2.0	0.4	0.5	1.2	0.6	0.3	0.2		0.7	1.1	0.8	-	
06600L	Cyanide	mg CN/l	0.030	<0.010	<0.010	<0.010	0.020	<0.010	<0.010	0.009	0.025	0.045	<0.010	0.009	0.021	0.011		
08202L	BOD (total)	mg/l	70	65	20	14	30	76	30	30	65	40	40	80	110	10	20	
08205L	Dissolved BOD	mg/l	60		12	4												
08301L	COD (total)	mg/l	70	81	130	40	185	160	130	60	185	130	200	339	361	55	163	
08303L	Dissolved COD	mg/l	-		70	40												
06534L	Phenol	mg/l	0.020	0.007	0.005	0.003	0.040	0.070	0.020	0.009	0.020	0.018	0.020	0.017	0.013	0.031	0.012	
15408L	Total Phosphorus	mg P/l	3.50	2.00	1.10	0.70	2.60	2.00	2.00	1.80	1.75	1.19	1.20	1.15	1.54	1.10		
15406L	Diss. Phosphorus	mg P/l	1.50	1.00	0.40	0.25												
15252L	Orthophoshate	mg P/l	1.50	0.70	0.30	0.20	2.20			-	1.15	0.81	0.90	0.94	1.32	0.63	0.47	
	Organic Phosph	mg P/l	2.00	1.30	0.80	0.50	0.40			-	0.60	0.38	0.30	0.21	0.22	0.47		
07556L	Ammonia Nitrogen	mg N/l	1.30	3.00	6.00	2.90	10.00		10.00	5.00	6.00	4.30	3.40	3.18	5.51	1.65	2.95	
07306L	Nitrate Nitrogen	mg N/l	0.09	0.50	0.35	1.20	0.06		0.02	0.01	0.02	0.088	0.090	0.114	0.106	0.043	0.032	
07209L	Nitrite Nitrogen	mg N/l	0.000	0.007	0.060	0.150	0.001		0.010	0.010	0.007	0.004	0.002	0.031	0.048	0.021	0.003	
07008L	Kjeldahl Nitrogen	mg N/l	19.00	12.00	8.00	7.00	12.00	12.00	16.00	13.00	13.00	15.19	10.00	10.62	18.25	7.34		
07054L	Diss. Kjeldahl N.	mg N/l	17.00	8.00	8.00	5.00			6.00									
07407L	Organic Nitrogen	mg N/l	17.70	9.00	2.00	4.10	2.00		16.03	8.00	7.00	10.39	6.60	7.45	12.74	5.69		
07408L	Diss. Organic N.	mg N/l	15.70	5.00	2.00	2.10												
07801L	Total Nitrogen	mg N/l	19.090	12.507	8.410	8.350	12.061		10.400	13.020	13.027	15.29	10.09	10.77	18.40	7.40		
07802L	Diss. Nitrogen	mg N/l	17.090	8.507	8.410	6.350												
08402L	Total OC alcaline	mg/l	10.1	25.5	14.0	7.8	12.0	10.6	-	7.6	18.4	20.0	5.2	7.0	7.4	4.8	4.4	
08403L	Diss. OC alcaline	mg/l	-		10.0	5.2												
08101L	DO	mg/l	0	0			0		3									
06522L	Hexan extractable	mg/l	16	11	5	-	16	<4	30									
10401L	Suspended Solids	mg/l	50	40	20	45	30	30	30	17	30	30	43	65	99	22	15	
08306L	TOC	mg/l	*									25	20	41	43	7	10	
08307L	Dissolved TOC	mg/l	*															
36111L	Fecal Coli x1000	MPN/100ml	800		24000	>160	30000	-	13000	16000	1300	50000	17000	8000	24000	13000	30000	
36101L	Total Coli x1000	MPN/100ml	3000		-	>160	50000	-	50000	16000	1300	90000	22000	30000	24000	24000	30000	
48004L	Cadmium	mg Cd/l	0.010	0.014	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	
82004L	Lead	mg Pb/l	<0.02	0.10	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	<0.02	<0.02	0.04	0.10	
29005L	Copper	mg Cu/l	0.020	0.030	0.015	0.005	0.040	0.010	0.010	0.005			0.010	0.005	0.010	<0.005	<0.005	
24101L	Chromium IV	mg Cu/l	<0.01	<0.01	<0.01	<0.01	<0.01											
24002L	Chromium	mg Cr/l	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
80013L	Mercury	ug Hg/l	<0.10	<0.10	<0.10	<0.10	0.1	<0.10	<0.10	0.20	0.10	<0.10	<0.10	0.15	0.20	0.10	<0.10	
30003L	Zinc	mg Zn/l	0.100	0.350	0.030	0.040	0.070	0.020	<0.005	0.030	0.250	0.040	0.030	0.060	0.090	0.040	0.020	
18001L	pp'DDT	ug/l	<0.001		<0.001	<0.001												
18022L	op'DDE	ug/l	<0.001		<0.001	<0.001												
18023L	pp'DDE	ug/l	<0.001		<0.001	<0.001												
18013L	pp'DDD	ug/l	<0.001		<0.001	<0.001												
18170L	PCB's	ug/l	<0.01		<0.01	<0.01												

APPENDIX 2

RESULTS OF HOURLY CHANGE SURVEY ON THREE MODEL RIVERS
ON CLEAR DAYS

Table APP. 2-1 Runoff Load of Hourly change Survey on Four Model Rivers on Clear Days

(19-20 APR. 1993)

NAME OF THE RIVER : RIO ACARI(Urban Area)

TIME	Water Quality						Runoff Load					Estimated Value of Runoff Load					
	Discharge	BOD	CODmn	T-N	T-P	SS	BOD Load	CODmnLoad	T-N Load	T-P Load	SS Load	Discharge	BOD Load	CODmnLoad	T-N Load	T-P Load	SS Load
(Hour)	(m3/s)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(m3/s)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)
10	6.223	30	6.0	10.074	2.15	40	1.344	0.269	0.451	0.096	1.792	6.438	1.630	0.283	0.515	0.106	1.974
12	6.653	40	6.2	12.073	2.40	45	1.916	0.297	0.578	0.115	2.156	6.920	2.252	0.309	0.549	0.142	1.492
14	7.187	50	6.2	10.047	3.25	16	2.587	0.321	0.520	0.168	0.828	7.264	3.408	0.330	0.579	0.166	2.132
16	7.341	80	6.4	12.057	3.10	65	4.228	0.338	0.637	0.164	3.436	6.929	3.522	0.324	0.649	0.163	2.656
18	6.517	60	6.6	14.070	3.45	40	2.815	0.310	0.660	0.162	1.877	6.480	2.799	0.317	0.609	0.167	2.330
20	6.442	60	7.0	12.040	3.70	60	2.783	0.325	0.558	0.172	2.783	6.160	2.873	0.294	0.513	0.164	2.661
22	5.878	70	6.2	11.049	3.70	60	2.963	0.262	0.468	0.157	2.539	5.772	2.807	0.262	0.377	0.139	1.535
24	5.665	65	6.4	7.038	3.00	13	2.651	0.261	0.287	0.122	0.530	5.590	2.616	0.254	0.382	0.119	1.258
2	5.514	65	6.2	12.030	2.90	50	2.581	0.246	0.478	0.115	1.985	5.283	2.200	0.236	0.385	0.108	2.084
4	5.052	50	6.2	8.040	2.80	60	1.819	0.226	0.292	0.102	2.182	5.017	1.627	0.210	0.308	0.100	1.629
6	4.982	40	5.4	9.046	2.75	30	1.435	0.194	0.324	0.099	1.076	5.056	1.271	0.193	0.255	0.096	1.092
8	5.130	30	5.2	5.033	2.55	30	1.108	0.192	0.186	0.094	1.108	5.672	1.225	0.226	0.340	0.101	1.225
10	6.214	30	5.8	11.043	2.39	30	1.342	0.259	0.494	0.107	1.342						
											TOTAL(t/d)	72.580	28.229	3.235	5.462	1.571	22.067
												6.048					

NAME OF THE RIVER : RIO MACACU(Natural Area)

TIME	Water Quality						Runoff Load					Estimated Value of Runoff Load					
	Discharge	BOD	CODmn	T-N	T-P	SS	BOD Load	CODmnLoad	T-N Load	T-P Load	SS Load	Discharge	BOD Load	CODmnLoad	T-N Load	T-P Load	SS Load
(Hour)	(m3/s)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(m3/s)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)
10	6.851	2	1.2	1.203	0.06	16	0.099	0.059	0.059	0.003	0.789	6.969	0.100	0.045	0.050	0.003	0.650
12	7.087	2	0.6	0.804	0.06	10	0.102	0.031	0.041	0.003	0.510	7.031	0.101	0.020	0.037	0.003	0.506
14	6.974	2	0.2	0.653	0.05	10	0.100	0.010	0.033	0.003	0.502	6.998	0.101	0.030	0.037	0.003	0.630
16	7.021	2	1.0	0.803	0.05	15	0.101	0.051	0.041	0.003	0.758	6.966	0.100	0.025	0.035	0.003	0.752
18	6.911	2	0.0	0.603	0.05	15	0.100	0.000	0.030	0.002	0.746	6.656	0.096	0.074	0.030	0.003	0.719
20	6.400	2	3.2	0.654	0.06	15	0.092	0.147	0.030	0.003	0.691	6.361	0.092	0.092	0.033	0.003	0.573
22	6.321	2	0.8	0.803	0.05	10	0.091	0.036	0.037	0.002	0.455	6.309	0.091	0.036	0.034	0.002	0.454
24	6.296	2	0.8	0.703	0.05	10	0.091	0.036	0.032	0.002	0.453	6.301	0.091	0.036	0.027	0.002	0.590
2	6.305	2	0.8	0.504	0.05	16	0.091	0.036	0.023	0.002	0.726	6.520	0.094	0.038	0.026	0.002	0.848
4	6.734	2	0.8	0.604	0.05	20	0.097	0.039	0.029	0.002	0.970	6.673	0.096	0.038	0.030	0.002	0.961
6	6.611	2	0.8	0.654	0.05	20	0.095	0.038	0.031	0.002	0.952	6.466	0.093	0.028	0.030	0.003	0.704
8	6.321	2	0.4	0.653	0.06	10	0.091	0.018	0.030	0.003	0.455	6.629	0.095	0.024	0.031	0.003	0.852
10	6.936	2	0.6	0.653	0.06	25	0.100	0.030	0.033	0.003	1.248						
											TOTAL(t/d)	79.875	1.150	0.487	0.402	0.031	8.239
												6.656					

Table APP. 2-1 Runoff Load of Hourly change Survey on Four Model Rivers on Clear Days

(27TO28 OCT. 1992)

NAME OF THE RIVER : RIO ACARI(Urban Area)

TIME	Water Quality						Runoff Load					Estimated Value of Runoff Load					
	Discharge	BOD	CODmn	T-N	T-P	SS	BOD Load	CODmnLoad	T-N Load	T-P Load	SS Load	Discharge	BOD Load	CODmnLoad	T-N Load	T-P Load	SS Load
(Hour)	(m3/s)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(m3/s)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)
10	6.231	50	4.0	13.065	1.65	80	2.243	0.179	0.586	0.074	3.589	6.454	2.323	0.195	0.607	0.087	3.718
12	6.677	50	4.4	13.065	2.10	80	2.404	0.212	0.628	0.101	3.846	7.142	2.845	0.259	0.782	0.131	8.632
14	7.607	60	5.6	17.085	2.95	245	3.286	0.307	0.936	0.162	13.419	7.631	2.883	0.308	0.966	0.147	9.190
16	7.655	45	5.6	18.090	2.40	90	2.480	0.309	0.997	0.132	4.960	7.248	2.841	0.287	0.919	0.136	5.312
18	6.840	65	5.4	17.085	2.85	115	3.201	0.266	0.841	0.140	5.664	6.683	3.010	0.255	0.775	0.128	5.534
20	6.526	60	5.2	15.075	2.45	115	2.819	0.244	0.708	0.115	5.404	6.317	2.729	0.237	0.575	0.113	4.681
22	6.108	60	5.2	10.050	2.50	90	2.639	0.229	0.442	0.110	3.958	6.012	2.384	0.212	0.435	0.091	3.044
24	5.916	50	4.6	10.050	1.70	50	2.130	0.196	0.428	0.072	2.130	5.735	2.065	0.190	0.395	0.074	2.065
2	5.554	50	4.6	9.045	1.90	50	1.999	0.184	0.362	0.076	1.999	5.218	1.703	0.173	0.304	0.068	1.527
4	4.882	40	4.6	7.035	1.70	30	1.406	0.162	0.247	0.060	1.055	5.005	1.072	0.162	0.291	0.058	1.081
6	5.128	20	4.4	9.045	1.55	30	0.738	0.162	0.334	0.057	1.108	5.406	0.778	0.175	0.373	0.059	1.065
8	5.683	20	4.6	10.050	1.50	25	0.818	0.188	0.411	0.061	1.023	5.872	1.064	0.199	0.315	0.063	4.063
10	6.061	30	4.8	5.025	1.50	160	1.309	0.209	0.219	0.065	6.982						
											TOTAL(t/d)	74.722	25.697	2.653	6.738	1.157	49.850
												6.227					

NAME OF THE RIVER : RIO MACACU(Natural Area)

TIME	Water Quality						Runoff Load					Estimated Value of Runoff Load					
	Discharge	BOD	CODmn	T-N	T-P	SS	BOD Load	CODmnLoad	T-N Load	T-P Load	SS Load	Discharge	BOD Load	CODmnLoad	T-N Load	T-P Load	SS Load
(Hour)	(m3/s)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(m3/s)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)
10	7.925	2	1.0	0.611	0.05	15	0.114	0.057	0.035	0.003	0.856	8.019	0.115	0.058	0.029	0.002	0.866
12	8.112	2	1.0	0.407	0.03	15	0.117	0.058	0.024	0.002	0.876	8.587	0.124	0.062	0.025	0.003	0.895
14	9.062	2	1.0	0.407	0.06	14	0.130	0.065	0.027	0.004	0.913	8.958	0.129	0.071	0.048	0.004	0.967
16	8.853	2	1.2	1.086	0.06	16	0.127	0.076	0.069	0.004	1.020	8.775	0.126	0.063	0.052	0.003	0.823
18	8.697	2	0.8	0.543	0.05	10	0.125	0.050	0.034	0.003	0.626	8.515	0.123	0.055	0.029	0.003	0.523
20	8.332	2	1.0	0.407	0.05	7	0.120	0.060	0.024	0.003	0.420	8.143	0.117	0.059	0.028	0.003	0.639
22	7.953	2	1.0	0.543	0.05	15	0.115	0.057	0.031	0.003	0.859	7.954	0.115	0.052	0.035	0.003	0.687
24	7.954	2	0.8	0.679	0.04	9	0.115	0.046	0.039	0.002	0.515	7.936	0.114	0.057	0.035	0.003	0.429
2	7.918	2	1.2	0.543	0.05	6	0.114	0.068	0.031	0.003	0.342	7.863	0.113	0.102	0.038	0.003	0.565
4	7.808	2	2.4	0.814	0.05	14	0.112	0.135	0.046	0.003	0.787	7.815	0.124	0.107	0.046	0.002	0.675
6	7.822	2	1.4	0.814	0.03	10	0.135	0.079	0.046	0.002	0.563	7.855	0.147	0.085	0.061	0.002	0.708
8	7.888	3	1.6	1.357	0.05	15	0.159	0.091	0.077	0.003	0.852	7.963	0.137	0.086	0.048	0.003	0.889
10	8.038	2	1.4	0.339	0.06	16	0.116	0.081	0.020	0.003	0.926						
											TOTAL(t/d)	98.381	1.485	0.855	0.475	0.034	8.665
												8.198					

Table APP. 2-1 Runoff Load of Hourly change Survey on Four Model Rivers on Clear Days

(7to8 DEC. 1992)

NAME OF THE RIVER : RIO SAO JOAO DE MERITI(Urban Area)

TIME	Water Quality						Runoff Load					Estimated Value of Runoff Load							
	Discharge	BOD	CODmn	T-N	T-P	SS	BOD Load	CODmn Load	T-N Load	T-P Load	SS Load	Discharge	BOD Load	CODmn Load	T-N Load	T-P Load	SS Load	Waterlevel	Salinity
(Hour)	(m3/s)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(m3/s)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(m)	(%)
10	5.632	28	18.0	13.039	2.10	85	1.135	0.730	0.529	0.085	3.447	-9.728	-2.322	-1.351	-0.596	-0.138	-5.050	0.900	0.390
12	-25.088	32	19.0	9.529	2.00	75	-5.780	-3.432	-1.721	-0.361	-13.548	0.296	-0.671	0.040	0.159	-0.014	-3.075	1.300	0.730
14	25.680	24	19.0	11.033	1.80	40	4.438	3.513	2.040	0.333	7.396	15.732	2.802	2.131	1.250	0.206	5.176	1.780	6.930
16	5.784	28	18.0	11.033	1.90	71	1.166	0.750	0.459	0.079	2.957	30.019	5.270	3.695	1.327	0.391	12.220	1.850	2.520
18	54.253	24	17.0	5.617	1.80	55	9.375	6.641	2.194	0.703	21.484	62.173	9.734	7.105	3.527	0.781	11.247	1.580	0.680
20	70.092	20	15.0	9.629	1.70	2	10.093	7.570	4.859	0.858	1.009	53.616	9.325	6.325	3.771	0.670	6.655	1.100	0.640
22	37.140	32	19.0	10.030	1.80	46	8.557	5.081	2.682	0.481	12.301	5.342	1.612	0.826	0.386	0.060	2.722	0.960	0.350
24	-26.456	28	18.0	10.030	1.90	36	-5.334	-3.429	-1.911	-0.362	-6.857	-36.381	-7.334	-6.048	-2.527	-0.464	-19.265	1.240	0.560
2	-46.305	28	26.0	9.428	1.70	95	-9.335	-8.668	-3.143	-0.567	-31.673	-1.786	-1.591	-1.873	0.897	-0.068	-11.221	1.870	10.960
4	42.733	20	16.0	16.048	1.40	30	6.154	4.923	4.938	0.431	9.230	32.661	6.004	3.925	3.937	0.378	7.543	2.100	8.930
6	22.589	36	18.0	18.054	2.00	36	5.855	2.928	2.936	0.325	5.855	31.336	8.122	4.783	4.797	0.466	6.535	1.760	2.900
8	40.083	36	23.0	23.069	2.10	25	10.390	6.638	6.658	0.606	7.215	37.631	9.754	5.978	5.996	0.556	4.367	1.450	2.400
10	35.178	36	21.0	21.063	2.00	6	9.118	5.319	5.335	0.507	1.520							1.120	1.950
											TOTAL(t/d)	220.910	40.705	25.537	22.923	2.822	17.853		
												18.409							

(14to15 Oct. 1993)

NAME OF THE RIVER : RIO GAPIMIRIM

TIME	Water Quality						Runoff Load					Estimated Value of Runoff Load							
	Discharge	BOD	CODmn	T-N	T-P	SS	BOD Load	CODmn Load	T-N Load	T-P Load	SS Load	Discharge	BOD Load	CODmn Load	T-N Load	T-P Load	SS Load	Waterlevel	Salinity
(Hour)	(m3/s)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(m3/s)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(t/2hrs)	(m)	(%)
10	24.402	2	1.8	0.770	0.103	20	0.351	0.316	0.135	0.018	3.514	17.725	0.255	0.214	0.086	0.013	2.075	0.900	0.390
12	11.048	2	1.4	0.470	0.090	8	0.159	0.111	0.037	0.007	0.636	10.959	0.158	0.111	0.041	0.007	0.691	1.300	0.730
14	10.889	2	1.4	0.560	0.080	10	0.157	0.110	0.044	0.006	0.745	11.924	0.172	0.120	0.046	0.006	0.829	1.780	6.930
16	12.958	2	1.4	0.510	0.070	10	0.187	0.131	0.048	0.007	0.933	26.468	0.381	0.238	0.107	0.009	2.481	1.850	2.520
18	39.978	2	1.2	0.580	0.040	14	0.576	0.345	0.167	0.012	4.030	34.362	0.495	0.338	0.140	0.017	4.395	1.580	0.580
20	28.745	2	1.6	0.550	0.104	23	0.414	0.331	0.114	0.022	4.760	28.265	0.407	0.326	0.128	0.017	4.181	1.100	0.540
22	27.785	2	1.6	0.710	0.062	18	0.400	0.320	0.142	0.012	3.601	20.968	0.302	0.231	0.110	0.010	2.310	0.960	0.350
24	14.151	2	1.4	0.760	0.067	10	0.204	0.143	0.077	0.007	1.019	13.930	0.201	0.140	0.082	0.007	1.250	1.240	0.560
2	13.709	2	1.4	0.870	0.069	15	0.197	0.138	0.086	0.007	1.481	12.973	0.187	0.131	0.066	0.007	1.445	1.870	10.960
4	12.237	2	1.4	0.520	0.080	16	0.176	0.123	0.046	0.007	1.410	23.767	0.342	0.163	0.104	0.012	2.611	2.100	8.930
6	35.297	2	0.8	0.640	0.070	15	0.508	0.203	0.163	0.018	3.812	37.432	0.539	0.415	0.177	0.021	4.755	1.760	2.900
8	39.567	2	2.2	0.670	0.083	20	0.570	0.627	0.191	0.024	5.698	33.554	0.485	0.553	0.186	0.022	4.846	1.450	2.400
10	27.740	2	2.4	0.910	0.099	20	0.399	0.479	0.182	0.020	3.995							1.120	1.950
											TOTAL(t/d)	272.435	3.923	2.980	1.273	0.146	31.878		
												22.703							

Table APP. 2-2 Results of River Water Quality Analysis of Hourly Chnage Survey

RIO MACACU

Number of sampling			1	2	3	4	5	6	7	8	9	10	11	12	13
Date of sampling			27/9/92	27/9/92	27/9/92	27/9/92	27/9/92	27/9/92	27/9/92	28/9/92	28/9/92	28/9/92	28/9/92	28/9/92	28/9/92
General number of the laboratory			12383	12384	12385	12386	12307	12388	12389	12390	12391	12392	12393	12394	12395
CODE	PARAMETER	UNITY													
	Time	H	11.00	13.00	15.00	17.00	19.00	21.00	23.00	1.00	3.00	5.00	7.00	9.00	11.00
02062F	Air temperature	C													
02061F	Water temperature	C													
08202L	BOD (total)	mg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.4	2.8	<2.0
08301L	COD (total)	mg/l	10	10	30	15	10	<10	10	<10	<10	<10	<10	<10	10
15408L	Total Phosphorus	mg P/l	0.05	0.03	0.06	0.06	0.05	0.05	0.05	0.04	0.05	0.05	0.03	0.05	0.06
07008L	Kjeldahl Nitrogen	mg N/l	0.45	0.30	0.30	0.80	0.49	0.30	0.40	0.50	0.40	0.60	0.80	1.00	0.25
08402L	Total OC alcaline	mg/l	1.0	1.0	1.0	1.2	0.8	1.0	1.0	0.8	1.2	2.4	1.4	1.6	1.4
10401L	Suspended Solids	mg/l	15	15	14	16	10	7	15	9	6	14	10	15	16
08306L	TOC	mg/l													

Number of sampling			1	2	3	4	5	6	7	8	9	10	11	12	13
Date of sampling			19/04/93	19/04/93	19/04/93	19/04/93	19/04/93	19/04/93	19/04/93	19/04/93	20/04/93	20/04/93	20/04/93	20/04/93	20/04/93
General number of the laboratory			5654	5655	5656	5657	5658	5659	5660	5661	5662	5663	5664	5665	5666
CODE	PARAMETER	UNITY													
	Time	H	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	2.00	4.00	6.00	8.00	10.00
02062F	Air temperature	C	28.00	29.00	32.00	31.00	28.00	26.00	26.00	19.00	22.00	21.00	20.50	19.50	29.00
02061F	Water temperature	C	23.77	24.88	26.24	26.59	26.07	25.66	24.84	24.32	23.57	22.95	22.50	22.40	23.07
08202L	BOD (total)	mg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
08301L	COD (total)	mg/l	<10	<10	10	<10	20	<10	<10	<10	<10	<10	<10	<10	15
15408L	Total Phosphorus	mg P/l	0.06	0.06	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.06
07309L	Nitrate Nitrogen	mg N/l	0.2	0.2	0.15	0.2	0.1	0.2	0.2	0.2	0.15	0.2	0.2	0.2	0.2
07209L	Nitrite Nitrogen	mg N/l	0.003	0.004	0.003	0.003	0.003	0.004	0.003	0.003	0.004	0.004	0.004	0.003	0.003
07008L	Kjeldahl Nitrogen	mg N/l	1.00	0.60	0.50	0.60	0.50	0.45	0.60	0.50	0.35	0.40	0.45	0.45	0.45
07801L	Total Nitrogen	mg N/l	1.203	0.804	0.553	0.803	0.603	0.654	0.803	0.703	0.504	0.604	0.654	0.653	0.553
08402L	Total OC alcaline	mg/l	1.2	0.6	0.2	1.0	0.0	3.2	0.8	0.8	0.8	0.8	0.8	0.4	0.6
10401L	Suspended Solids	mg/l	16	10	10	15	15	15	10	10	16	20	20	10	25
08306L	TOC	mg/l													

Table APP. 2-2 Results of River Water Quality Analysis of Hourly Chnage Survey

P10 ACAR1(Urban Area)

Number of sampling		1	2	3	4	5	6	7	8	9	10	11	12	13
Date of sampling		27/9/92	27/9/92	27/9/92	27/9/92	27/9/92	27/9/92	27/9/92	28/9/92	28/9/92	28/9/92	28/9/92	28/9/92	28/9/92
General number of the laboratory		12396	12397	12398	12399	12400	12401	12402	12403	12404	12405	12406	12407	12408
CODE	PARAMETER	UNITY												
	Time	H	11.00	13.00	15.00	17.00	19.00	21.00	23.00	1.00	3.00	5.00	7.00	9.00	11.00
02062F	Air temperature	C	34.00	35.00	35.00	33.00	29.00	28.00	28.50	27.00	24.00	24.00	25.00	28.50	34.00
02061F	Water temperature	C	27.30	29.00	30.26	30.02	28.99	28.04	27.23	26.72	26.33	26.07	25.88	25.97	27.16
08202L	BOD (total)	mg/l	50	50	80	45	65	50	60	50	50	40	20	20	30
08301L	COD (total)	mg/l	150	190	280	280	220	220	225	180	180	145	50	100	100
15408L	Total Phosphorus	mg P/l	1.65	2.10	2.95	2.40	2.85	2.45	2.50	1.70	1.90	1.70	1.55	1.50	1.50
07008L	Kjeldahl Nitrogen	mg N/l	13.00	13.00	17.00	18.00	17.00	15.00	10.00	10.00	9.00	7.00	9.00	10.00	5.00
08402L	Total OC alcaline	mg/l	4.0	4.4	5.6	5.6	5.4	5.2	5.2	4.6	4.6	4.6	4.4	4.6	4.8
10401L	Suspended Solids	mg/l	80	80	245	90	115	115	90	50	50	30	30	25	160
08306L	TOC	mg/l													

Number of sampling		1	2	3	4	5	6	7	8	9	10	11	12	13
Date of sampling		19/04/93	19/04/93	19/04/93	19/04/93	19/04/93	19/04/93	19/04/93	19/04/93	20/04/93	20/04/93	20/04/93	20/04/92	20/04/93
General number of the laboratory		5589	5590	5591	5592	5593	5594	5595	5596	5597	5598	5599	5600	5601
CODE	PARAMETER	UNITY												
	Time	H	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	2.00	4.00	6.00	8.00	10.00
02062F	Air temperature	C	26.50	28.00	29.00	28.00	26.00	25.00	24.00	24.00	22.00	21.50	22.50	24.50	27.00
02061F	Water temperature	C	26.85	28.04	29.17	29.05	27.85	27.23	26.49	26.11	25.91	25.79	25.58	25.80	26.55
08202L	BOD (total)	mg/l	30	40	50	80	60	60	70	65	65	50	40	30	30
08301L	COD (total)	mg/l	50	75	90	160	150	190	175	150	100	90	55	60	50
15408L	Total Phosphorus	mg P/l	2.15	2.40	3.25	3.10	3.45	3.70	3.70	3.00	2.90	2.80	2.75	2.55	2.39
07309L	Nitrate Nitrogen	mg N/l	0.07	0.07	0.04	0.05	0.05	0.03	0.04	0.03	0.02	0.03	0.04	0.03	0.04
07209L	Nitrite Nitrogen	mg N/l	0.004	0.003	0.007	0.007	0.02	0.01	0.009	0.008	0.01	0.01	0.005	0.003	0.003
07008L	Kjeldahl Nitrogen	mg N/l	10.00	12.00	10.00	12.00	14.00	12.00	11.00	7.00	12.00	8.00	9.00	5.00	11.00
07801L	Total Nitrogen	mg N/l	10.074	12.073	10.047	12.057	14.07	12.04	11.049	7.038	12.03	8.04	9.046	5.033	11.043
08402L	Total OC alcaline	mg/l	6.0	6.2	6.2	6.4	6.6	7.0	6.2	6.4	5.2	6.2	5.4	5.2	5.8
10401L	Suspended Solids	mg/l	40	45	16	65	40	60	60	13	50	60	30	30	30
08306L	TOC	mg/l													

Table APP. 2-2 Results of River Water Quality Analysis of Hourly Chnage Survey

Rio S.J.de Meriti(1992)

Number of sampling			1	2	3	4	5	6	7	8	9	10	11	12	13
DATE OF SAMPLING		DEC.92	07/12	07/12	07/12	07/12	07/12	07/12	07/12	07/12	08/12	08/12	08/12	08/12	08/12
General number of the laboratory			14354	14355	14356	14357	14358	14359	14360	14361	14362	14363	14364	14365	14366
CODE	PARAMETER	UNITY													
	Time	H	9.00	11.00	13.00	15.00	17.00	19.00	21.00	23.00	1.00	3.00	5.00	7.00	9.00
02062F	Air temperature	C	26.00	30.00	33.00	30.00	28.50	26.00	24.00	23.50	23.00	22.00	22.00	22.50	27.50
02061F	Water temperature	C	26.61	27.45	30.54	28.76	28.22	28.12	28.64	28.39	27.44	27.18	27.87	27.45	25.98
08202L	BOD (total)	mg/l	28	32	24	28	24	20	32	28	28	20	36	36	36
08301L	COD (total)	mg/l	120	160	380	290	110	140	120	120	850	850	330	290	210
15408L	Total Phosphorus	mg P/l	2.10	2.00	1.80	1.90	1.80	1.70	1.80	1.90	1.70	1.40	2.00	2.10	2.00
07008L	Kjeldahl Nitrogen	mg N/l	13.00	9.50	11.00	11.00	5.60	9.60	10.00	10.00	9.40	10.00	13.00	12.00	13.00
08402L	Total OC alcaline	mg/l	18.0	19.0	19.0	18.0	17.0	15.0	19.0	18.0	26.0	16.0	18.0	23.0	21.0
10401L	Suspended Solids	mg/l	85	75	40	71	55	2	46	36	195	30	36	25	6
08306L	TOC	mg/l													

Rio Guapimirim (1993)

NO.OF SAMPLING			1	2	3	4	5	6	7	8	9	10	11	12	13
DATE OF SAMPLING		Oct93	10/14	10/14	10/14	10/14	10/14	10/14	10/14	10/14	10/14	10/14	10/14	10/14	10/14
General number of the laboratory			15270	15271	15272	15273	15274	15275	15276	15277	15278	15279	15280	15281	15282
CODE	PARAMETER	UNITY													
	Time	H	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	2.00	4.00	6.00	8.00	10.00
02062F	Air temperature	C	26.50	29.00	32.00	31.00	29.50	25.00	23.50	21.50	21.00	20.00	19.00	24.00	26.00
02061F	Water temperature	C	24.90	26.24	25.70	25.96	25.42	27.76	27.34	27.24	27.11	26.70	26.71	26.01	25.80
08202L	BOD (total)	mg/l	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
08301L	COD (total)	mg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
15408L	Total Phosphorus	mg P/l	0.103	0.090	0.080	0.070	0.040	0.104	0.062	0.067	0.069	0.080	0.070	0.083	0.099
07555L	Ammonia Nitrogen	mg N/l	0.010	0.005	0.000	0.002	0.002	0.007	0.007	0.006	0.002	0.013	0.005	0.003	0.004
07306L	Nitrate Nitrogen	mg N/l	0.198	0.169	0.176	0.135	0.170	0.202	0.130	0.157	0.201	0.210	0.166	0.185	0.144
07209L	Nitrite Nitrogen	mg N/l	0.025	0.006	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.005	0.004	0.005
07008L	Kjeldahl Nitrogen	mg N/l	0.57	0.30	0.38	0.37	0.41	0.35	0.57	0.59	0.66	0.30	0.47	0.48	0.77
07801L	Total Nitrogen	mg N/l	0.77	0.47	0.56	0.51	0.58	0.55	0.71	0.76	0.87	0.52	0.64	0.67	0.91
08402L	Total OC alcaline	mg/l	1.8	1.4	1.4	1.4	1.2	1.8	1.6	1.4	1.4	1.4	0.8	2.2	2.4
10401L	Suspended Solids	mg/l	20	8	9.5	10	14	23	13	10	15	16	15	20	20
08306L	TOC	mg/l	<5	7	<5	<5	7	5	7	<5	9	<5	6	8	<5

APPENDIX 3

RESULTS OF CONTINUOUS SURVEY ON TWO MODEL RIVERS
ON RAINY DAYS

Table APP. 3-1 Runoff Load of Continuous Survey on the two Model Rivers on Rainy Days

Rio Acari (16to29 Nov. 1992)

Date	Time (Hour)	Water Quality						Runoff Load				
		Discharge (m3/1)	BOD (mg/1)	CODmn (mg/1)	TN (mg/1)	TP (mg/1)	SS (mg/1)	BOD Load (t/1hrs)	CODmnLoad (t/1hrs)	TN Load (t/1hrs)	TP Load (t/1hrs)	SS Load (t/1hrs)
11/16	12	7.08										
11/17	7	18.03										
	8	12.10										
	9	11.40										
	10	7.08										
	15	8.80	44.0	11.0	10.0	1.0	65	1.89	0.35	0.32	0.03	2.06
	18	18.91	44.0	11.4	8.5	1.0	55	3.00	0.78	0.58	0.07	3.74
	21	20.73	40.0	11.4	2.8	1.0	100	2.99	0.85	0.21	0.07	7.46
11/18	0	25.65	38.0	12.8	2.6	1.0	300	3.51	1.18	0.24	0.09	27.70
	3	23.13	34.0	9.0	1.0	0.4	60	2.83	0.75	0.08	0.03	5.00
	6	8.21	30.0	9.2	1.0	0.5	30	0.89	0.27	0.03	0.01	0.89
	9	8.21	22.0	9.6	6.0	0.5	16	0.65	0.28	0.18	0.01	0.47
	12	8.80	34.0	11.2	9.5	0.5	20	1.08	0.35	0.30	0.02	0.63
	15	8.80	28.0	10.0	10.5	1.0	24	0.89	0.32	0.33	0.03	0.76
	18	8.21	30.0	9.8	9.0	1.0	36	0.89	0.29	0.27	0.03	1.06
	21	10.39	30.0	9.6	9.0	1.0	30	1.12	0.36	0.34	0.04	1.12
11/19	0	9.74	28.0	10.0	9.5	1.0	60	0.98	0.35	0.33	0.04	2.10
	3	9.11	26.0	9.2	6.5	1.5	80	0.85	0.30	0.21	0.05	2.62
	6	8.80	26.0	9.2	7.0	1.5	60	0.82	0.29	0.22	0.05	1.90
	9	7.08	24.0	8.8	7.5	1.0	16	0.61	0.22	0.19	0.03	0.41
	12	8.21	34.0	9.4	9.5	1.5	20	1.00	0.28	0.28	0.04	0.59
	15	7.92	40.0	9.2	12.0	2.0	20	1.14	0.26	0.34	0.06	0.57
	18	7.35	60.0	3.2	9.5	2.0	30	1.59	0.08	0.25	0.05	0.79
	21	7.35	64.0	12.6	10.0	2.0	14	1.69	0.33	0.26	0.05	0.37
11/20	0	7.08	34.0	10.8	7.5	2.0	22	0.87	0.28	0.19	0.05	0.56
	3	7.08	54.0	11.2	11.0	2.0	30	1.38	0.29	0.28	0.05	0.76
	6	6.81	38.0	9.4	10.0	2.0	32	0.93	0.23	0.25	0.05	0.78
	12	6.81	40.0	10.2	16.0	2.0	38	0.98	0.25	0.39	0.05	0.93
	18	7.63	52.0	18.0	11.0	2.0	50	1.43	0.49	0.30	0.05	1.37
11/21	0	7.92	60.0	10.6	9.5	2.0	30	1.71	0.30	0.27	0.06	0.86
	6	6.28	16.0	4.2	7.0	1.5	26	0.36	0.10	0.16	0.03	0.59
	12	7.35	22.0	9.6	14.0	2.0	46	0.58	0.25	0.37	0.05	1.22
	18	7.63	56.0	20.0	10.0	2.0	70	1.54	0.55	0.27	0.05	1.92
11/22	0	7.35	48.0	9.8	11.5	2.0	40	1.27	0.26	0.30	0.05	1.06
	6	6.81	22.0	9.8	7.5	1.5	22	0.54	0.24	0.18	0.04	0.54
	12	7.35	28.0	15.6	8.5	2.0	60	0.74	0.41	0.22	0.05	1.59
	18	7.63	22.0	9.4	1.9	1.5	50	0.60	0.26	0.05	0.04	1.37
11/23	0	7.92	20.0	9.0	4.3	1.5	55	0.57	0.26	0.12	0.04	1.57
	6	7.63	24.0	17.0	8.0	1.0	70	0.66	0.47	0.22	0.03	1.92
	12	7.63	60.0	10.4	13.0	2.0	85	1.65	0.29	0.36	0.05	2.34
	18	7.35	20.0	9.0	2.3	1.5	70	0.53	0.24	0.06	0.04	1.85
11/24	0	8.21	16.0	7.4	0.8	0.5	100	0.47	0.22	0.02	0.01	2.95
	6	8.80	14.0	8.0	2.6	1.5	12	0.44	0.25	0.08	0.05	0.38
	12	8.50	32.0	16.0	2.0	1.5	40	0.98	0.49	0.06	0.05	1.22
	18	7.63	24.0	60.0	4.8	1.5	25	0.66	1.65	0.13	0.04	0.69
11/25	0	7.35	12.0	26.0	6.8	1.5	26	0.32	0.69	0.16	0.04	0.69
	6	6.81	32.0	24.0	3.4	1.5	60	0.78	0.59	0.08	0.04	1.47
	18	10.06	50.0	28.0	4.0	2.0	40	1.81	1.01	0.14	0.07	1.45
11/26	6	17.60	74.0	46.0	10.5	0.5	140	4.69	2.91	0.67	0.03	8.87
	9	73.87										
	13	125.52	30.0	26.0	6.0	0.1	500	13.56	11.75	2.71	0.03	225.94
	14	117.63	30.0	30.0	1.4	0.1	750	12.70	12.70	0.59	0.04	317.59
	15	100.54	26.0	10.0	1.2	0.0	620	9.41	3.62	0.43	0.01	224.41
	16	86.69	24.0	11.6	1.8	0.1	710	7.49	3.62	0.56	0.02	221.59
	17	75.64										
	18	68.69	26.0	18.0	1.4	0.1	310	6.43	4.45	0.35	0.02	76.65
	19	67.00	20.0	32.0	1.0	0.1	230	4.82	7.72	0.24	0.02	55.48
	20	67.00	18.0	10.0	4.5	0.3	220	4.34	2.41	1.09	0.07	53.06
	21	66.17	16.0	20.0	0.2	0.2	200	3.81	4.76	0.04	0.05	47.64
	22	66.17	18.0	34.0	2.2	0.3	210	4.29	8.10	0.52	0.07	50.02
	23	64.51	10.0	8.0	1.2	0.1	130	2.32	1.86	0.28	0.02	30.19
11/27	0	62.88	14.0	14.0	1.2	0.1	160	3.17	3.17	0.27	0.02	36.22
	6	62.07	12.0	10.8	2.6	0.1	130	2.68	2.41	0.58	0.01	29.05
	9	62.07	14.0	10.2	4.0	0.2	90	3.13	2.28	0.89	0.03	20.11
	13	15.52	16.0	9.4	3.5	1.0	70	0.89	0.53	0.20	0.06	3.91
	15	12.82	16.0	12.2	9.5	1.0	65	0.74	0.56	0.44	0.05	3.00
11/28	6	9.42	4.0	2.2	1.2	0.5	20	0.14	0.07	0.04	0.02	0.68
	18	7.63	20.0	10.8	10.0	1.5	20	0.55	0.30	0.27	0.04	0.55
11/29	6	7.35	10.0	8.8	1.6	1.0	7	0.26	0.23	0.04	0.03	0.19

Table APP. 3-1 Runoff Load of Continuous Survey on the two Model Rivers on Rainy Days

Rio Macacu (17to30 Nov. 1992)

Data	Time (Hour)	Water Quality						Runoff Load				
		Discharge (m3/s)	BOD (mg/l)	CODMn (mg/l)	TN (mg/l)	TP (mg/l)	SS (mg/l)	BOD Load (t/1hrs)	CODMnLoad (t/1hrs)	TN Load (t/1hrs)	TP Load (t/1hrs)	SS Load (t/1hrs)
11/17	0	13.74	0.8	2.8	0.5	0.1	14	0.04	0.14	0.02	0.00	0.69
	8	47.49	1.6	6.2	0.8	0.3	95	0.27	1.06	0.14	0.04	16.24
	9	40.81	1.6	7.0	0.8	0.3	100	0.24	1.03	0.12	0.04	14.69
	10	37.46	0.8	6.4	0.8	0.3	55	0.11	0.86	0.11	0.03	7.42
	11	32.10	1.2	7.2	0.5	0.2	50	0.14	0.85	0.06	0.02	5.86
	12	27.91	1.2	6.6	0.4	0.2	40	0.12	0.66	0.04	0.02	4.02
	14	22.21	0.8	7.2	0.6	0.2	36	0.06	0.58	0.05	0.01	2.88
	15	21.89	1.2	6.8	0.8	0.2	34	0.09	0.54	0.05	0.01	2.68
	16	20.96	1.4	6.4	0.7	0.1	34	0.11	0.48	0.05	0.00	2.57
	17	20.35	0.6	6.0	0.5	0.1	34	0.04	0.44	0.04	0.01	2.49
	18	20.35	1.2	6.2	0.8	0.1	6	0.09	0.45	0.06	0.01	0.44
	19	25.48	0.8	8.0	0.6	0.2	55	0.07	0.73	0.06	0.02	5.05
	20	27.91	1.4	8.0	1.0	0.3	90	0.14	0.80	0.10	0.03	9.04
	21	30.07	2.0	9.6	1.0	0.5	180	0.22	1.04	0.11	0.05	19.49
	22	38.29	1.8	8.2	1.0	0.5	170	0.25	1.13	0.14	0.06	23.43
	23	38.70	1.4	8.8	0.7	0.4	150	0.20	1.23	0.10	0.06	20.90
11/18	2	39.86	0.8	8.6	0.6	0.4	120	0.09	1.24	0.09	0.05	17.26
	5	30.44	0.8	7.8	0.5	0.2	46	0.09	0.85	0.05	0.02	5.04
	8	26.85	0.6	6.0	0.5	0.2	70	0.06	0.58	0.05	0.01	6.77
	11	23.49	0.6	5.8	0.5	0.1	30	0.05	0.49	0.04	0.01	2.54
	14	21.27	0.8	2.2	0.4	0.2	38	0.06	0.17	0.03	0.01	2.91
	17	20.05	0.2	1.8	0.6	0.1	28	0.01	0.13	0.04	0.01	2.02
	20	19.46	1.0	1.6	0.3	0.1	20	0.07	0.11	0.02	0.01	1.40
	21	19.16	0.6	1.0	0.4	0.1	20	0.04	0.07	0.03	0.00	1.38
11/19	0	19.75	0.8	1.8	0.4	0.1	20	0.06	0.13	0.03	0.00	1.42
	3	20.05	0.2	1.2	0.6	0.1	20	0.01	0.09	0.04	0.00	1.44
	6	19.75	0.4	1.0	0.3	0.1	20	0.03	0.07	0.02	0.00	1.42
	9	18.87	0.2	1.2	0.4	0.1	20	0.01	0.08	0.03	0.00	1.36
	12	18.29	0.8	1.0	0.5	0.1	24	0.05	0.07	0.03	0.00	1.58
	18	16.89	0.6	0.4	0.5	0.1	10	0.04	0.02	0.03	0.01	0.61
11/20	0	16.61	1.0	0.8	0.4	0.1	5	0.06	0.05	0.02	0.00	0.30
	6	16.07	0.8	0.0	0.4	0.1	8	0.05	0.00	0.02	0.00	0.46
	12	15.80	0.4	0.0	0.4	0.1	10	0.02	0.00	0.02	0.00	0.57
	18	14.76	0.8	0.0	0.3	0.1	2	0.04	0.00	0.02	0.00	0.11
11/21	0	14.50	1.0	0.0	0.4	0.1	2	0.05	0.00	0.02	0.00	0.10
	6	14.50	0.8	0.8	0.3	0.1	8	0.04	0.04	0.02	0.00	0.47
	12	14.24	0.8	0.4	0.2	0.1	9	0.04	0.02	0.01	0.00	0.46
	17	14.50	0.8	0.8	0.4	0.1	20	0.04	0.04	0.02	0.00	1.04
	18	14.76	0.6	0.6	0.4	0.1	18	0.03	0.03	0.02	0.00	0.95
	19	22.85	1.0	1.2	0.3	0.1	150	0.08	0.10	0.02	0.01	12.34
	20	37.87	2.0	3.4	0.8	0.4	320	0.27	0.46	0.11	0.05	16.36
11/22	0	22.85	1.2	8.2	1.0	0.3	120	0.10	0.67	0.08	0.02	9.87
	4	17.16	1.0	3.2	0.4	0.1	36	0.06	0.20	0.02	0.01	2.22
	8	16.89	0.6	0.0	0.6	0.1	30	0.04	0.00	0.04	0.01	1.82
	12	15.27	0.6	0.8	0.3	0.1	20	0.03	0.04	0.02	0.00	1.10
	18	14.24	0.8	1.0	0.5	0.1	20	0.04	0.05	0.03	0.00	1.03
11/23	0	20.98	0.8	0.0	0.5	0.1	30	0.06	0.00	0.04	0.01	2.26
	6	15.27	1.0	0.0	0.3	0.1	26	0.05	0.00	0.02	0.00	1.43
	12	14.24	0.6	3.4	0.3	0.1	16	0.03	0.17	0.02	0.00	0.82
	18	13.50	1.6	0.6	0.5	0.0	16	0.08	0.03	0.02	0.00	0.78
11/24	0	13.25	0.6	0.0	0.2	0.1	16	0.03	0.00	0.01	0.00	0.76
	6	19.16	1.2	0.4	0.5	0.1	30	0.08	0.03	0.02	0.00	2.07
	7	21.58	1.4	2.0	0.6	0.2	60	0.11	0.16	0.05	0.01	4.66
	8	20.96	1.0	1.6	0.5	0.2	70	0.08	0.12	0.05	0.01	5.28
	9	20.35	0.8	1.4	0.8	0.1	40	0.06	0.10	0.06	0.01	2.93
	12	19.16	1.0	2.8	1.2	0.1	55	0.07	0.19	0.08	0.01	3.79
	16	16.34	0.8	1.2	0.4	0.1	40	0.05	0.07	0.02	0.00	2.35
11/25	0	16.34	0.6	1.0	0.4	0.1	30	0.04	0.06	0.02	0.00	1.76
	6	14.76	0.4	1.6	0.4	0.1	55	0.02	0.08	0.02	0.00	2.92
	12	14.24	0.6	1.0	0.2	0.0	16	0.02	0.05	0.01	0.00	0.82
	18	13.50	0.8	0.0	0.5	0.1	20	0.04	0.00	0.01	0.00	0.97
11/26	0	13.25	0.8	2.2	0.5	0.1	2	0.04	0.10	0.02	0.00	0.10
	16	14.76	0.7	3.2	1.0	0.2	35	0.04	0.17	0.05	0.01	1.86
	17	16.89	1.2	6.0	1.2	0.2	32	0.07	0.36	0.07	0.01	1.95
	18	45.21	0.8	11.0	1.4	0.2	560	0.13	1.79	0.23	0.02	91.14
	19	82.27	4.8	52.0	6.5	0.1	200	1.42	15.40	1.93	0.03	59.23
	20	101.52	3.2	11.0	2.0	0.1	580	1.17	4.02	0.73	0.02	211.97
	21	94.88	2.6	10.6	1.6	0.0	170	0.89	3.62	0.55	0.01	58.07
11/27	3	82.27	0.8	5.8	0.6	0.0	40	0.24	1.72	0.18	0.00	11.85
	9	32.10	1.0	7.6	0.8	0.0	55	0.12	0.89	0.09	0.00	6.47
	12	29.70	1.2	8.4	0.6	0.0	300	0.13	0.68	0.06	0.00	32.08
	18	31.56	0.8	4.8	0.4	0.2	50	0.09	0.55	0.04	0.02	5.68
	20	36.66	0.4	5.4	0.5	0.2	60	0.05	0.71	0.06	0.02	7.92
	21	40.81	0.2	6.4	0.3	0.2	70	0.03	0.94	0.04	0.03	10.29
11/28	0	36.64										
	3	35.84										
	4	32.70										
	5	30.44										
	6	30.44	0.6	6.5	0.3	0.2	53	0.07	0.71	0.03	0.02	5.81
	12	28.26										
	18	25.48	0.8	6.5	0.3	0.1	36	0.07	0.60	0.03	0.01	3.30
11/29	0	24.15	0.4	2.4	0.3	0.0	28	0.03	0.21	0.03	0.00	2.43
	6	22.21	0.8	3.0	0.3	0.1	30	0.06	0.24	0.02	0.01	2.40
	12	20.35	0.8	2.2	0.6	0.0	16	0.06	0.16	0.04	0.00	1.17
	18	19.16	0.6	2.8	0.3	0.1	20	0.04	0.19	0.02	0.00	1.38
11/30	0	18.58	0.6	2.6	0.3	0.1	40	0.04	0.17	0.02	0.01	2.68
	6	18.01	1.0	2.6	0.3	0.1	20	0.06	0.17	0.02	0.01	1.30

Table APP. 3-2 Results of River Water Quality Analysis of Continuous Survey

RIO MACACU

Date of sampling		NOV. 92	16/11	17/11	17/11	17/11	17/11	17/11	17/11	17/11	17/11	17/11	17/11	17/11	17/11	17/11	17/11
General number of the laboratory			13204	13205	13206	13207	13208	13209	13210	13211	13212	13213	13214	13215	13216	13217	13218
CODE	PARAMETER	UNITY															
	Time	H	16.00	8.00	9.00	10.00	11.00	12.00	14.35	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00
02062F	Air temperature	C	35.00	25.00	26.00	25.00	25.00	24.00	23.00	23.00	22.00	22.00	4.00	19.50	20.00	19.00	19.00
02061F	Water temperature	C	27.03	22.44	22.39	22.24	22.00	23.00	22.00	22.50	22.00	23.00	22.50	21.00	22.00	22.00	21.00
02080F	Transp. (tube)	cm	26.0														
02042F	Conduct. (field)	m	0.05														
17300F	Salinity (field)	%.	0.03														
10300F	pH (field)		6.94														
08102F	DO (field)	mg/l	6.1														
02041L	Conduct. (lab)	umho/cm	33	30	37	31	27	29	28	30	34	29	32	32	35	36	31
10301L	pH (lab)		7.20	6.08	6.79	6.54	6.75	6.72	6.30	7.19	7.31	7.08	7.42	7.33	6.96	7.16	7.03
08202L	BOD (total)	mg/l	0.8	1.6	1.6	0.8	1.2	1.2	0.8	1.2	1.4	0.6	1.2	0.8	1.4	2.0	1.8
08301L	COD (total)	mg/l	25	25	35	25	30	25	25	30	30	25	25	25	30	40	40
15408L	Total Phosphorus	mg P/l	0.06	0.25	0.30	0.25	0.20	0.15	0.15	0.06	0.10	0.10	0.10	0.20	0.30	0.50	0.45
07008L	Kjeldahl Nitrogen	mg N/l	0.9	0.8	0.8	0.8	0.5	0.4	0.6	0.6	0.7	0.5	0.8	0.6	1.0	1.0	1.0
08402L	Total OC alcaline	mg/l	2.8	6.2	7.0	6.4	7.2	6.6	7.2	6.8	6.4	6.0	6.2	8.0	8.0	9.6	8.2
10401L	Suspended Solids	mg/l	14	95	100	55	50	40	36	34	34	34	6	55	90	180	170
08306L	TOC	mg/l															

Date of sampling		NOV. 92	17/11	18/11	18/11	18/11	18/11	18/11	18/11	18/11	18/11	18/11	18/11	19/11	19/11	19/11	19/11
General number of the laboratory			13219	13220	13221	13222	13223	13436	13437	13438	13439	13440	13441	13442	13443	13444	13445
CODE	PARAMETER	UNITY															
	Time	H	23.00	2.00	5.00	8.00	11.00	14.00	17.00	17.30	20.30	21.00	24.00	3.00	6.00	9.00	12.00
02062F	Air temperature	C	20.00	19.50	20.00	22.00	24.50	23.00	22.00	21.00	20.00	20.00	19.50	20.00	19.00	25.00	28.00
02061F	Water temperature	C	21.50	21.00	21.00	21.00	23.00	23.00	22.00	22.00	21.00	21.00	21.00	21.00	18.00	21.00	23.00
02080F	Transp. (tube)	cm															
02042F	Conduct. (field)	m															
17300F	Salinity (field)	%.															
10300F	pH (field)																
08102F	DO (field)	mg/l															
02041L	Conduct. (lab)	umho/cm	28	29	26	27	27	30	31	28	28	29	28	27	30	31	30
10301L	pH (lab)		6.91	7.13	7.18	7.03	7.15	7.15	7.04	7.18	7.01	7.02	6.84	7.11	7.3	6.98	7.27
08202L	BOD (total)	mg/l	1.4	0.6	0.8	0.6	0.6	0.8	0.2	0.4	1.0	0.6	0.8	0.2	0.4	0.2	0.8
08301L	COD (total)	mg/l	30	35	25	20	30	15	10	10	<10	15	<10	<10	10	<10	10
15408L	Total Phosphorus	mg P/l	0.40	0.35	0.15	0.15	0.10	0.15	0.10	0.09	0.08	0.06	0.06	0.06	0.07	0.06	0.07
07008L	Kjeldahl Nitrogen	mg N/l	0.7	0.6	0.5	0.5	0.5	0.4	0.6	0.4	0.3	0.4	0.4	0.6	0.3	0.4	0.5
08402L	Total OC alcaline	mg/l	8.8	8.6	7.8	6.0	5.8	2.2	1.8	2.0	1.6	1.0	1.8	1.2	1.0	1.2	1.0
10401L	Suspended Solids	mg/l	150	120	46	70	30	38	28	20	20	20	20	20	20	20	24
08306L	TOC	mg/l															

Table APP. 3-2 Results of River Water Quality Analysis of Continuous Survey

RIO MACACU

Date of sampling		NOV. 92	19/11	19/11	20/11	20/11	20/11	20/11	21/11	21/11	21/11	21/11	21/11	21/11	21/11	22/11	22/11
General number of the laboratory			13533	13534	13535	13536	13537	13538	13539	13540	13541	13542	13543	13544	13545	13546	13547
CODE	PARAMETER	UNITY															
	Time	H	18.00	24.00	6.00	12.00	18.00	24.00	6.00	12.00	17.00	18.00	19.00	20.00	24.00	4.30	8.00
02062F	Air temperature	C	29.50	20.00	18.00	22.00	24.00	22.00	21.00	26.00	25.00	24.00	23.00	22.00	21.00	20.00	22.00
02061F	Water temperature	C	22.50	21.00	20.00	23.00	24.00	23.00	21.00	23.00	25.00	25.00	24.00	23.00	22.00	20.00	21.00
02080F	Transp. (tube)	cm															
02042F	Conduct. (field)	m															
17300F	Salinity (field)	%.															
10300F	pH (field)																
08102F	DO (field)	mg/l															
02041L	Conduct. (lab)	umho/cm	29	30	29	30	30	29	30	29	30	30	30	30	30	27	30
10301L	pH (lab)		7.33	7.22	7.19	7.27	6.82	7.26	7.32	7.18	7.60	7.56	7.81	7.52	7.52	7.43	7.47
08202L	BOD (total)	mg/l	0.6	1.0	0.8	0.4	0.8	1.0	0.8	0.8	0.8	0.6	1.0	2.0	1.2	1.0	0.6
08301L	COD (total)	mg/l	<10	<10	<10	<10	<10	15	20	15	15	20	<10	15	30	35	<10
15408L	Total Phosphorus	mg P/l	0.09	0.06	0.06	0.07	0.07	0.06	0.06	0.07	0.08	0.09	0.10	0.40	0.30	0.10	0.09
07008L	Kjeldahl Nitrogen	mg N/l	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.2	0.4	0.4	0.3	0.8	1.0	0.4	0.6
08402L	Total OC alcaline	mg/l	0.4	0.8	0.0	0.0	0.0	0.0	0.8	0.4	0.8	0.6	1.2	3.4	8.2	3.2	0.0
10401L	Suspended Solids	mg/l	10	5	8	10	2	2	9	9	20	18	150	120	120	36	30
08306L	TOC	mg/l															

Date of sampling		NOV. 92	22/11	22/11	22/11	23/11	23/11	23/11	23/11	24/11	24/11	24/11	24/11	24/11	24/11	24/11	25/11
General number of the laboratory			13548	13702	13703	13704	13705	13706	13707	13708	13709	13710	13711	13712	13713	13714	13715
CODE	PARAMETER	UNITY															
	Time	H	12.00	18.00	24.00	6.00	12.00	18.00	24.00	6.00	7.00	8.00	9.00	12.00	18.00	24.00	6.00
02062F	Air temperature	C	29.00	27.00	22.00	21.00	25.00	23.00	22.00	21.00	22.00	22.00	22.00	24.00	22.00	20.00	21.00
02061F	Water temperature	C	24.00	26.00	23.00	21.00	23.00	23.00	22.00	21.00	22.00	22.00	22.00	22.00	23.00	21.00	21.00
02080F	Transp. (tube)	cm															
02042F	Conduct. (field)	m															
17300F	Salinity (field)	%.															
10300F	pH (field)																
08102F	DO (field)	mg/l															
02041L	Conduct. (lab)	umho/cm	30	-	30	45	31	33	30	28	27	27	25	26	30	28	28
10301L	pH (lab)		7.85	6.80	5.65	5.10	6.98	5.98	6.87	6.03	5.95	5.70	5.32	5.87	6.98	6.94	6.14
08202L	BOD (total)	mg/l	0.6	0.8	0.8	1.0	0.6	1.6	0.6	1.2	1.4	1.0	0.8	1.0	0.6	0.6	0.4
08301L	COD (total)	mg/l	<10	<10	<10	10	<10	<10	<10	<10	<10	10	10	15	10	<10	<10
15408L	Total Phosphorus	mg P/l	0.08	0.06	0.07	0.06	0.06	0.04	0.05	0.07	0.15	0.15	0.10	0.10	0.08	0.05	0.06
07008L	Kjeldahl Nitrogen	mg N/l	0.3	0.5	0.5	0.3	0.3	0.5	0.2	0.3	0.6	0.5	0.8	1.2	0.4	0.4	0.4
08402L	Total OC alcaline	mg/l	0.8	1.0	0.0	0.0	3.4	0.6	0.0	0.4	2.0	1.6	1.4	2.8	1.2	1.0	1.6
10401L	Suspended Solids	mg/l	20	20	30	26	16	16	16	30	60	70	40	55	40	30	55
08306L	TOC	mg/l															

Table APP. 3-2 Results of River Water Quality Analysis of Continuous Survey

RIO MACACU

Date of sampling		NOV. 92	25/11	25/11	26/11	26/11	26/11	26/11	26/11	26/11	26/11	27/11	27/11	27/11	27/11	27/11	27/11
General number of the laboratory			13716	13717	13936	14137	13935	14139	13937	13938	13939	13940	13941	13942	14124	14125	14126
CODE	PARAMETER	UNITY															
	Time	H	12.00	18.00	6.00	16.00	17.00	18.00	19.00	20.00	21.00	3.00	9.00	12.00	18.00	20.00	21.00
02062F	Air temperature	C	26.50	25.00	23.00	22.00	21.00	21.00	21.00	22.00	22.00	21.00	21.00	21.00	20.00	20.00	20.00
02061F	Water temperaturec	C	23.00	24.50	22.00	23.00	23.00	23.00	21.00	21.00	21.00	20.00	21.00	20.00	20.50	20.00	20.00
02080F	Transp. (tube)	cm															
02042F	Conduct. (field)	m															
17300F	Salinity (field)	%.															
10300F	pH (field)																
08102F	DO (field)	mg/l															
02041L	Conduct. (lab)	umho/cm	28	31	29	30	32	31	27	24	23	24	26	25	29	25	26
10301L	pH (lab)		6.11	6.08	7.62	6.90	7.20	6.90	6.56	6.79	7.03	6.93	7.42	7.46	6.98	7.01	6.92
08202L	BOD (total)	mg/l	0.4	0.8	0.8	0.7	1.2	0.8	4.8	3.2	2.6	0.8	1.0	1.2	0.8	0.4	0.2
08301L	COD (total)	mg/l	<10	<10	<10	<10	10	20	340	70	60	15	15	15	10	<10	10
15408L	Total Phosphorus	mg P/l	0.04	0.05	0.06	0.17	0.17	0.15	0.10	0.05	0.02	0.01	0.01	0.01	0.15	0.15	0.20
07008L	Kjeldahl Nitrogen	mg N/l	0.2	0.3	0.50	1.00	1.2	1.40	6.50	2.00	1.60	0.60	0.80	0.60	0.35	0.45	0.30
08402L	Total OC alcaline	mg/l	1.0	0.0	2.2	3.2	5.0	11.0	52.0	11.0	10.6	5.8	7.6	6.4	4.8	5.4	6.4
10401L	Suspended Solids	mg/l	16	20	<2	35	32	560	200	580	170	40	55	300	50	60	70
08306L	TOC	mg/l															

Date of sampling		NOV. 92	28/11	28/11	29/11	29/11	29/11	29/11	30/11
General number of the laboratory			14127	14128	14129	14133	14130	14134	14135
CODE	PARAMETER	UNITY							
	Time	H	18.00	24.00	6.00	12.00	18.00	24.00	6.00
02062F	Air temperature	C	20.00	19.00	16.00	23.00	22.00	19.00	14.00
02061F	Water temperaturec	C	21.00	20.00	17.00	22.00	22.00	19.00	13.00
02080F	Transp. (tube)	cm							
02042F	Conduct. (field)	m							
17300F	Salinity (field)	%.							
10300F	pH (field)								
08102F	DO (field)	mg/l							
02041L	Conduct. (lab)	umho/cm	27	29	30	32	32	32	33
10301L	pH (lab)		6.88	6.78	6.71	6.90	6.87	7.02	6.93
08202L	BOD (total)	mg/l	0.8	0.4	0.8	0.8	0.6	0.6	1.0
08301L	COD (total)	mg/l	15	<10	<10	<10	<10	<10	<10
15408L	Total Phosphorus	mg P/l	0.10	0.04	0.08	0.04	0.07	0.10	0.08
07008L	Kjeldahl Nitrogen	mg N/l	0.33	0.30	0.30	0.50	0.30	0.30	0.30
08402L	Total OC alcaline	mg/l	6.5	2.4	3.0	2.2	2.8	2.6	2.6
10401L	Suspended Solids	mg/l	36	28	30	16	20	40	20
08306L	TOC	mg/l							

Table APP. 3-2 Results of River Water Quality Analysis of Continuous Survey

RIO ACARI

Date of sampling		NOV. 92	17/11	17/11	17/11	18/11	18/11	18/11	18/11	18/11	18/11	18/11	18/11	19/11	19/11	19/11	19/11
General number of the laboratory			13229	13230	13231	13232	13233	13234	13235	13236	13427	13428	13429	13430	13431	13432	13433
CODE	PARAMETER	UNITY															
	Time	H	15.00	18.00	21.00	0.00	3.00	6.00	9.00	12.00	15.00	18.00	21.00	0.00	3.00	6.00	9.00
02062F	Air temperature	C	27.00	25.00	23.00	20.00	23.00	24.00	25.00	23.00	25.00	24.00	2.00	19.00	19.00	20.00	26.00
02061F	Water temperature	C	26.06	30.02	28.30	23.04	20.02	24.02	24.00	20.03	20.05	24.05	23.00	21.00	20.00	21.36	25.03
02080F	Transp. (tube)	cm															
02042F	Conduct. (field)	m															
17300F	Salinity (field)	%.															
10300F	pH (field)																
08102F	DO (field)	mg/l															
02041L	Conduct. (lab)	umho/cm	370	370	380	270	290	320	350	400	400	380	410	430	360	340	320
10301L	pH (lab)		7.52	7.54	7.6	7.5	7.74	7.85	7.82	7.74	7.36	7.17	7.31	7.19	7.15	7.2	7.36
08202L	BOD (total)	mg/l	26	26	24	12	8	8	10	14	20	16	18	18	4	2	2
08301L	COD (total)	mg/l	30	50	35	35	25	30	20	25	70	70	60	70	50	60	35
15408L	Total Phosphorus	mg P/l	1.00	1.00	1.00	1.00	0.35	0.50	0.50	0.50	1.00	1	1	1	1.5	1.5	1
07008L	Kjeldahl Nitrogen	mg N/l	10.0	8.5	2.8	2.6	1.0	1.0	6.0	9.5	10.5	9.0	9.0	9.5	6.5	7.0	7.5
08402L	Total OC alcaline	mg/l	11.0	11.4	11.4	12.8	9.0	9.2	9.6	11.2	10.0	9.8	9.6	10.0	9.2	9.2	8.8
10401L	Suspended Solids	mg/l	65	55	100	300	60	30	16	20	24	36	30	60	80	60	16
08306L	TOC	mg/l															

Date of sampling		NOV. 92	19/11	19/11	19/11	19/11	20/11	20/11	20/11	20/11	20/11	21/11	21/11	21/11	21/11	22/11	22/11
General number of the laboratory			13434	13435	13473	13474	13475	13476	13477	13478	13479	13480	13481	13482	13483	13484	13485
CODE	PARAMETER	UNITY															
	Time	H	12.00	15.00	18.00	21.00	0.00	3.00	6.00	12.00	18.00	0.00	6.00	12.00	18.00	0.00	6.00
02062F	Air temperature	C	30.00	34.00	26.00	26.00	20.00	20.00	20.00	32.00	31.00	21.00	20.00	31.00	28.00	28.00	29.00
02061F	Water temperature	C	27.04	28.04	20.00	20.00	20.04	20.04	20.00	28.99	28.00	20.04	20.00	28.00	26.00	26.00	25.00
02080F	Transp. (tube)	cm															
02042F	Conduct. (field)	m															
17300F	Salinity (field)	%.															
10300F	pH (field)																
08102F	DO (field)	mg/l															
02041L	Conduct. (lab)	umho/cm	340	430	380	430	460	470	450	430	470	450	330	370	440	420	320
10301L	pH (lab)		7.09	7.28	7.42	7.40	7.49	7.56	7.63	7.49	7.46	7.48	7.61	7.57	7.58	7.5	7.62
08202L	BOD (total)	mg/l	20	24	36	38	20	32	22	24	52	60	16	22	56	48	22
08301L	COD (total)	mg/l	50	60	70	70	35	45	60	60	100	100	45	60	140	80	50
15408L	Total Phosphorus	mg P/l	1.5	2	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.50	2.00	2.00	2.00	1.50
07008L	Kjeldahl Nitrogen	mg N/l	9.5	12.0	9.5	10.0	7.5	11.0	10.0	16.0	11.0	9.5	7.0	14.0	10.0	11.5	7.5
08402L	Total OC alcaline	mg/l	9.4	9.2	3.2	12.6	10.8	11.2	9.4	10.2	18.0	10.6	4.2	9.6	20.0	9.8	9.8
10401L	Suspended Solids	mg/l	20	20	30	14	22	30	32	38	50	30	26	46	70	40	22
08306L	TOC	mg/l															

Table APP. 3-2 Results of River Water Quality Analysis of Continuous Survey

RIO ACARI

Date of sampling		NOV.92	22/11	22/11	23/11	23/11	23/11	23/11	24/11	24/11	24/11	24/11	25/11	25/11	25/11	26/11	26/11	26/11
General number of the laboratory			13486	13736	13737	13738	13739	13740	13741	13742	13743	13744	13745	13746	13920	13925	13921	13922
CODE	PARAMETER	UNITY																
	Time	H	12.00	18.00	0.00	6.00	12.00	18.00	0.00	6.00	12.00	18.00	0.00	6.00	18.00	6.00	13.00	14.00
02062F	Air temperature	C	31.00	30.00	29.00	28.00	28.00	27.00	26.00	19.00	27.00	26.00	26.00	21.00	27.00	21.00	27.00	1426.00
02061F	Water temperaturec	C	29.00	28.00	28.00	26.00	26.00	25.00	25.00	23.00	24.00	25.00	25.00	25.00	26.00	25.00	26.00	25.00
02080F	Transp. (tube)	cm																
02042F	Conduct. (field)	m																
17300F	Salinity (field)	%.																
10300F	pH (field)																	
08102F	DO (field)	mg/l																
02041L	Conduct. (lab)	umho/cm	360	310	300	360	390	310	190	320	360	190	360	390	400	310	170	170
10301L	pH (lab)		7.78	7.11	7.2	7.08	6.99	7.05	7.09	7.14	6.55	7.07	6.54	7.64	6.97	7.05	7.08	7.05
08202L	BOD (total)	mg/l	28	22	20	24	60	20	16	14	32	24	12	32	50	>74	30	30
08301L	COD (total)	mg/l	130	60	40	70	120	50	30	40	70	120	30	60	90	350	80	70
15408L	Total Phosphorus	mg P/l	2.00	1.50	1.50	1.00	2.00	1.50	0.50	1.50	1.50	1.50	1.50	1.50	2.00	0.50	0.06	0.10
07008L	Kjeldahl Nitrogen	mg N/l	8.5	1.9	4.3	8.0	13.0	2.3	0.8	2.6	2.0	4.8	6.8	3.4	4.0	10.5	5.0	1.4
08402L	Total OC alcaline	mg/l	15.6	9.4	9.0	17.0	10.4	9.0	7.4	8.0	16.0	60.0	26.0	24.0	28.0	46.0	26.0	30.0
10401L	Suspended Solids	mg/l	60	50	55	70	85	70	100	12	40	25	26	60	40	140	500	75
08306L	TOC	mg/l																

Date of sampling		NOV.92	26/11	26/11	26/11	26/11	26/11	26/11	26/11	26/11	27/11	27/11	27/11	27/11	27/11	28/11	28/11	29/11
General number of the laboratory			13923	13924	13928	13929	13930	13931	13926	13927	13932	13933	13934	14061	14062	14063	14064	14065
CODE	PARAMETER	UNITY																
	Time	H	15.00	16.00	18.00	19.00	20.00	21.00	22.00	23.00	0.00	6.00	9.00	13.00	15.00	6.00	18.00	6.00
02062F	Air temperature	C	1526.00	1626.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	24.00	24.00	26.00	25.00	26.00	26.00	27.00
02061F	Water temperaturec	C	25.00	25.00	26.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	24.00	25.00	25.00	25.00	24.00	25.00
02080F	Transp. (tube)	cm																
02042F	Conduct. (field)	m																
17300F	Salinity (field)	%.																
10300F	pH (field)																	
08102F	DO (field)	mg/l																
02041L	Conduct. (lab)	umho/cm	170	170	200	260	260	270	260	220	230	230	300	390	430	320	550	380
10301L	pH (lab)		7.05	7.17	7.18	7.18	7.13	7.15	7.14	7.37	7.61	7.65	7.57	7.44	7.48	7.72	7.61	7.7
08202L	BOD (total)	mg/l	26	24	26	20	18	16	18	10	14	12	14	16	16	4	20	10
08301L	COD (total)	mg/l	130	90	80	50	30	30	50	20	30	30	30	100	120	70	110	55
15408L	Total Phosphorus	mg P/l	0.04	0.06	0.10	0.09	0.30	0.20	0.30	0.08	0.08	0.05	0.15	1.00	1.00	0.50	1.50	1.00
07008L	Kjeldahl Nitrogen	mg N/l	1.2	1.8	1.4	1.0	4.5	<0.15	2.2	1.2	1.2	2.6	4.0	3.5	9.5	1.2	10.0	1.6
08402L	Total OC alcaline	mg/l	10.6	11.6	18.0	32.0	10.0	20.0	34.0	8.0	14.0	10.8	10.2	9.4	12.2	2.2	10.8	8.8
10401L	Suspended Solids	mg/l	620	710	310	230	220	200	210	130	160	130	90	70	65	20	44	7
08306L	TOC	mg/l																

Table APP. 3-3 Rating Curves of the two Model Rivers

1. RIO ACARI H-QCURVE

NO.	H	H^2	Q	√Q	H*√Q
1.000	0.940	0.884	25.197	5.020	4.718
2.000	0.750	0.563	9.060	3.010	2.257
3.000	0.700	0.490	8.504	2.916	2.041
4.000	0.680	0.462	6.661	2.581	1.755
5.000	0.620	0.384	6.367	2.523	1.564
6.000	0.680	0.462	6.937	2.634	1.791
7.000	0.670	0.449	6.868	2.621	1.756
8.000	0.660	0.436	6.231	2.496	1.647
9.000	0.650	0.423	5.989	2.447	1.591
10.000	0.630	0.397	5.554	2.357	1.485
11.000	0.620	0.384	5.283	2.298	1.425
12.000	0.600	0.360	5.128	2.265	1.359
Σ	8.200	5.694	97.779	33.168	23.390

n[H√Q]	280.683		
[H][√Q]	271.974		
n[H^2]	68.323		
[H]^2	67.240		
[H^2][√Q]	188.843		
[H][H√Q]	191.800		
a	n[H√Q]-[H][√Q] / n[H^2]-[H]^2	8.709 / 1.083	8.040
b	[H^2][√Q]-[H][H√Q] / n[H^2]-[H]^2	-2.957 / 1.083	-2.730
a^2	64.638		
b/a	-0.340		

RIO ACARI
Q=a^2(H-b/a) /a)^2= 64.638 *(H-0.340)^2

2. RIO MACACU H-QCURVE

NO.	H	H^2	Q	√Q	H*√Q
1.000	1.790	3.204	31.785	5.638	10.092
2.000	1.750	3.063	31.312	5.596	9.792
3.000	1.520	2.310	24.022	4.901	7.450
4.000	0.630	0.397	3.528	1.878	1.183
5.000	0.930	0.865	7.330	2.707	2.518
6.000	1.360	1.850	17.154	4.142	5.633
7.000	0.960	0.922	8.420	2.902	2.786
8.000	0.950	0.903	8.038	2.835	2.693
9.000	0.940	0.884	8.106	2.847	2.676
10.000	0.930	0.865	7.942	2.818	2.621
Σ	11.760	15.261	147.637	36.264	47.444

n[H√Q]	474.442		
[H][√Q]	426.468		
n[H^2]	152.610		
[H]^2	138.298		
[H^2][√Q]	553.430		
[H][H√Q]	557.944		
a	n[H√Q]-[H][√Q] / n[H^2]-[H]^2	47.974 / 14.312	3.352
b	[H^2][√Q]-[H][H√Q] / n[H^2]-[H]^2	-4.514 / 14.312	-0.315
a^2	11.235		
b/a	-0.094		

RIO MACACU
Q=a^2(H-b/a) /a)^2= 11.235 *(H-0.094)^2

APPENDIX 4

RESULTS OF DETAILED SURVEY ON MAJOR HIGHLY POLLUTED RIVERS
ON CLEAR DAYS

Table APP. 4-1 Water Quality and Runoff Load of Detailed Survey on Major Highly Polluted Rivers on Clear Days

Runoff Load (Average Value) of seven(7) Rivers (Nov. 1992 - Apr. 1993)

(Number of Data : 3)

NO	NAME	Basin Area (Km2)	NO.	Discharge (m3/s)	Water Quality BOD (mg/l)	COD(Cr) (mg/l)	COD(Mn) (mg/l)	TN (mg/l)	TP (mg/l)	Runoff Load BOD Load (t/day)	COD(Cr)Load (t/day)	COD(Mn)Load (t/day)	TN Load (t/day)	TP Load (t/day)
1 MN000	CANAL DO MANGUE	42.80	23	5.349	108.67	230.00	10.73	14.68	1.77	63.07	119.03	4.93	7.41	0.89
2 MN001	CANAL DO MANGUE			0.260	170.67	320.00	7.80	14.68	1.93	3.71	6.79	0.18	0.32	0.05
3 CM030	RIO ESTRELA			0.452	90.00	230.00	8.73	17.68	1.82	3.52	8.71	0.35	0.71	0.07
4 TR060	RIO TRAPICHEIRO			0.378	88.67	203.33	7.07	15.68	1.83	2.90	6.50	0.23	0.51	0.06
5 MR042	RIO MARACANA			0.872	69.33	203.33	9.20	16.35	2.00	4.95	15.30	0.76	1.29	0.16
6 CN100	CANAL DO CUNHA	60.50	21	13.895	31.33	126.67	14.87	14.70	1.62	26.97	150.97	17.74	18.03	2.05
7 JC120	RIO JACARI			1.054	103.67	326.67	15.67	22.67	2.92	9.66	29.79	1.30	1.99	0.25
8 FR142	RIO FARIA			0.996	68.33	201.67	10.80	27.35	2.37	6.15	18.95	1.13	2.87	0.24
9 TM840	RIO TIMBO			1.024	100.00	310.00	21.60	18.02	2.47	8.28	26.06	1.79	1.64	0.22
10 IJ200	RIO IRAJA	27.30	20	4.365	37.33	168.33	15.47	11.63	1.70	13.02	63.69	6.03	4.20	0.66
11 IJ202	RIO IRAJA			1.134	30.67	116.67	8.40	15.33	1.83	2.99	11.36	0.83	1.50	0.18
12 IJ210	RIO IRAJA			0.411	78.67	171.67	17.33	18.69	2.07	2.69	5.93	0.58	0.67	0.07
13 PN180	CANAL DO PENHA	-	20	1.125	44.67	150.00	11.93	15.36	1.97	3.58	12.81	1.04	1.49	0.21
14 SJ220	RIO S.J. E MERITI	163.50	19	30.933	24.00	150.00	5.40	11.50	1.63	60.65	402.38	12.57	30.01	4.66
15 AC241	RIO ACARI			6.406	29.33	100.00	7.20	11.35	1.57	17.11	56.23	4.02	6.42	0.88
16 PD890	RIO DAS PEDRAS			1.398	61.33	206.67	12.53	15.68	2.33	7.38	25.39	1.61	2.00	0.29
17 TG120	RIO TINGUI			0.594	60.67	240.00	6.00	12.68	1.50	2.99	11.77	0.30	0.63	0.08
18 MG010	RIO MARANGA			2.514	55.00	140.00	6.80	11.68	1.80	12.28	31.26	1.53	2.49	0.40
19 PV980	RIO PAVUNA			1.034	66.00	168.33	9.40	18.35	2.08	6.23	14.62	0.79	1.64	0.17
20 PV982	RIO PAVUNA			0.502	66.00	123.33	9.00	13.68	1.73	2.43	5.19	0.44	0.44	0.07
21 SP300	RIO SARAPUI	159.80	17-6	25.621	25.33	68.33	11.20	9.01	1.97	53.30	160.49	22.98	19.14	4.74
22 SP310	RIO SARAPUI			3.535	37.00	108.33	13.83	12.35	1.80	10.93	29.09	3.94	3.52	0.55
23 SP330	RIO SARAPUI			2.812	28.00	70.00	9.80	8.34	0.99	6.24	14.89	2.45	1.86	0.18
24 IA260	RIO IGUACU	544.20	17-1 S	43.517	5.87	100.00	7.47	2.34	0.50	18.86	433.87	28.22	8.41	1.83
25 IA270	RIO IGUACU			23.387	8.20	26.67	6.00	1.64	0.67	15.16	61.55	11.83	2.24	1.45
26 IA280	RIO IGUACU			1.806	2.47	20.00	5.00	1.85	0.25	0.37	3.12	0.85	0.37	0.04
27 BT040	RIO DA BOTA			2.392	34.00	93.33	12.80	10.51	1.57	6.40	17.33	2.57	2.11	0.32
28 BT080	RIO DA BOTA			0.700	64.00	138.33	23.30	11.48	2.50	3.66	8.13	1.43	0.65	0.15
29 PL380	RIO PILAR			1.629	21.33	45.00	7.00	2.14	1.05	3.02	6.35	0.99	0.26	0.14

Table APP. 4-1 Water Quality and Runoff Load of Detailed Survey on Major Highly Polluted Rivers on Clear Days

Water Quality of seven(7) Rivers

Name	Basin Area (Km2)	NO.	NO	NAME	BOD (mg/l) Nov. 1992 11-13	BOD (mg/l) Nov. 1992 25-27	BOD (mg/l) Apr. 1993 23-25	Mean Value	COD(Cr) (mg/l) Nov. 1992 11-13	COD(Cr) (mg/l) Nov. 1992 25-27	COD(Cr) (mg/l) Apr. 1993 23-25	Mean Value	COD(Mn) (mg/l) Nov. 1992 11-13	COD(Mn) (mg/l) Nov. 1992 25-27	COD(Mn) (mg/l) Apr. 1993 23-25	Mean Value	TN (mg/l) Nov. 1992 11-13	TN (mg/l) Nov. 1992 25-27	TN (mg/l) Apr. 1993 23-25	Mean Value	TP (mg/l) Nov. 1992 11-13	TP (mg/l) Nov. 1992 25-27	TP (mg/l) Apr. 1993 23-25	Mean Value
CANAL DO MANGUE	42.80	23	1 MN000	CANAL DO MANGUE	240.0	56.0	30.0	108.67	360.0	140.0	190.0	230.00	10.4	9.4	12.4	10.73	21.00	10.00	13.05	14.68	2.50	1.50	1.30	1.77
			2 MN001	CANAL DO MANGUE	72.0	250.0	190.0	170.67	110.0	470.0	380.0	320.00	5.2	10.4	6.8	7.80	10.00	18.00	16.04	14.68	2.00	2.50	1.30	1.93
			3 CM030	RIO ESTRELA	96.0	84.0	90.0	90.00	190.0	210.0	290.0	230.00	10.6	10.2	5.4	8.73	19.00	21.00	13.03	17.68	2.00	2.00	1.45	1.82
			4 TR060	RIO TRAPICHEIRO	92.0	84.0	90.0	88.67	130.0	180.0	300.0	203.33	4.8	10.4	6.0	7.07	14.00	21.00	12.04	15.68	1.90	2.00	1.60	1.83
			5 MR042	RIO MARACANA	48.0	80.0	80.0	69.33	190.0	220.0	200.0	203.33	11.2	11.0	5.4	9.20	14.00	23.00	12.04	16.35	2.00	2.50	1.50	2.00
CANAL DO CUNHA	60.50	21	6 CN100	CANAL DO CUNHA	16.0	28.0	50.0	31.33	130.0	120.0	130.0	126.67	18.0	10.6	16.0	14.87	12.00	19.00	13.09	14.70	1.50	2.00	1.35	1.62
			7 JC120	RIO JACARI	86.0	105.0	120.0	103.67	330.0	320.0	330.0	326.67	30.0	10.4	6.6	15.67	28.00	23.00	17.03	22.67	4.50	2.50	1.75	2.92
			8 FR142	RIO FARIA	84.0	56.0	65.0	68.33	280.0	150.0	175.0	201.67	16.0	11.2	5.2	10.80	43.00	25.00	14.04	27.35	3.50	2.00	1.60	2.37
			9 TR840	RIO TIBIRO	90.0	80.0	130.0	100.00	350.0	220.0	380.0	310.00	28.0	11.8	25.0	21.60	21.00	18.00	15.07	18.02	3.50	2.00	1.90	2.47
RIO IRAJA	27.30	20	10 IJ200	RIO IRAJA	40.0	12.0	60.0	37.33	180.0	150.0	175.0	168.33	22.0	6.8	17.6	15.47	15.00	1.80	18.08	11.63	2.00	1.50	1.60	1.70
			11 IJ202	RIO IRAJA	42.0	20.0	30.0	30.67	210.0	50.0	90.0	116.67	8.0	11.2	6.0	8.40	16.00	13.00	17.00	15.33	2.50	1.50	1.50	1.83
			12 IJ210	RIO IRAJA	100.0	56.0	80.0	78.67	190.0	140.0	185.0	171.67	18.0	11.2	22.8	17.33	20.00	19.00	17.06	18.69	2.50	2.00	1.70	2.07
CANAL DO PENHA	-	20	13 PN180	CANAL DO PENHA	36.0	28.0	70.0	44.67	140.0	160.0		150.00	10.0	10.2	15.6	11.93	18.00	11.00	17.07	15.36	2.50	2.00	1.40	1.97
RIO S.J. DO MERITI	163.50	19	14 SJ220	RIO S.J. E MERITI	22.0	20.0	30.0	24.00	160.0	130.0	160.0	150.00	2.0	8.8	5.4	5.40	12.00	8.50	14.00	11.50	2.00	1.50	1.40	1.63
			15 AC241	RIO ACARI	54.0	4.0	30.0	29.33	130.0	30.0	140.0	100.00	8.0	8.0	5.6	7.20	15.00	10.00	9.04	11.35	2.00	1.50	1.20	1.57
			16 PD890	RIO DAS PEDRAS	68.0	56.0	50.0	61.33	290.0	170.0	160.0	206.67	20.0	11.8	5.8	12.53	19.00	18.00	10.03	15.68	3.50	2.00	1.50	2.33
			17 TG120	RIO TINGUI	40.0	52.0	90.0	60.67	190.0	150.0	380.0	240.00	2.0	9.8	6.2	6.00	11.00	10.00	17.04	12.68	1.50	1.50	1.50	1.50
			18 MG010	RIO MARANGA	60.0	60.0	45.0	55.00	170.0	140.0	110.0	140.00	4.0	10.4	6.0	6.80	11.00	11.00	13.04	11.68	2.00	2.00	1.40	1.80
			19 PV980	RIO PAVUNA	56.0	72.0	70.0	66.00	180.0	160.0	165.0	168.33	12.0	10.4	5.8	9.40	18.00	18.00	19.04	18.35	2.50	2.00	1.75	2.08
			20 PV982	RIO PAVUNA	54.0	44.0	90.0	66.00	170.0	90.0	110.0	123.33	10.0	11.4	5.6	9.00	11.00	7.00	23.03	13.68	2.00	1.50	1.70	1.73
RIO SARAPUI	159.80	17-6	21 SP300	RIO SARAPUI	22.0	24.0	30.0	25.33	90.0	50.0	65.0	68.33	8.8	10.8	14.0	11.20	9.50	5.50	12.03	9.01	2.50	2.00	1.40	1.97
			22 SP310	RIO SARAPUI	30.0	36.0	45.0	37.00	90.0	70.0	165.0	108.33	13.2	10.8	17.5	13.83	11.00	10.00	16.04	12.35	1.50	2.00	1.90	1.80
			23 SP330	RIO SARAPUI	24.0	20.0	40.0	28.00	90.0	40.0	80.0	70.00	12.0	10.8	6.6	9.80	9.00	6.00	10.03	8.34	1.50	0.07	1.40	0.99
RIO IGUACU	544.20	17-1	24 IA260	RIO IGUACU	2.6	4.0	10.0	5.87	190.0	20.0	90.0	100.00	6.0	11.2	5.2	7.47	2.20	1.80	3.02	2.34	0.45	0.50	0.55	0.50
			25 IA270	RIO IGUACU	6.6	8.0	10.0	8.20	40.0	20.0	20.0	26.67	3.6	5.4	5.0	6.00	0.60	1.20	3.12	1.64	1.00	0.35	0.65	0.67
			26 IA280	RIO IGUACU	2.2	2.0	3.2	2.47	20.0	20.0	20.0	20.00	4.6	7.0	3.4	5.00	1.00	4.00	0.57	1.86	0.30	0.25	0.20	0.25
			27 BT040	RIO DA BOTA	36.0	16.0	50.0	34.00	80.0	50.0	150.0	93.33	14.0	10.0	14.4	12.80	14.00	6.50	11.04	10.51	1.50	1.50	1.70	1.57
			28 BT080	RIO DA BOTA	54.0	48.0	90.0	64.00	140.0	110.0	165.0	138.33	16.4	32.0	21.5	23.30	18.00	1.40	15.05	11.48	3.00	2.50	2.00	2.50
			29 PL380	RIO PILAR	26.0	8.0	30.0	21.33	50.0	30.0	55.0	45.00	6.4	9.2	5.4	7.00	1.60	1.20	3.63	2.14	1.00	1.00	1.15	1.05

Table APP. 4-1 Water Quality and Runoff Load of Detailed Survey on Major Highly Polluted Rivers on Clear Days

Discharge of seven(7) Rivers

Name	Basin Area (Km2)	NO.	NO	Name	Discharge (m3/s) Nov. 1992 11-13	Discharge (m3/s) Nov. 1992 25-27	Discharge (m3/s) Apr. 1993 23-25	Mean Value	BOD Load (t/day) Nov. 1992 11-13	BOD Load (t/day) Nov. 1992 25-27	BOD Load (t/day) Apr. 1993 23-25	Mean Value	COD(Cr)Load (t/day) Nov. 1992 11-13	COD(Cr)Load (t/day) Nov. 1992 25-27	COD(Cr)Load (t/day) Apr. 1993 23-25	Mean Value
CANAL DO MANGUE	42.80	23	1 MN080	CANAL DO MANGUE	7.614	4.207	4.227	5.349	157.88	20.36	10.96	63.07	236.83	50.89	69.39	119.03
			2 MN001	CANAL DO MANGUE	0.338	0.340	0.102	0.260	2.10	7.34	1.67	3.71	3.21	13.81	3.35	6.79
			3 CM030	RIO ESTRELA	0.526	0.473	0.356	0.452	4.36	3.43	2.77	3.52	8.63	8.58	8.92	8.71
			4 TR060	RIO TRAPICHEIRO	0.420	0.360	0.354	0.378	3.34	2.61	2.75	2.90	4.72	5.60	9.18	6.50
			5 MR042	RIO MARACANA	1.167	0.994	0.455	0.872	4.84	6.87	3.14	4.95	19.16	18.89	7.86	15.30
CANAL DO CUNHA	60.50	21	6 CN100	CANAL DO CUNHA	22.311	17.692	1.681	13.895	30.84	42.80	7.26	26.97	250.60	183.43	18.88	150.97
			7 JC120	RIO JACARI	0.893	0.920	1.349	1.054	6.64	8.35	13.99	9.66	25.46	25.44	38.46	29.79
			8 FR142	RIO FARIA	1.557	1.141	0.290	0.996	11.30	5.52	1.63	6.15	37.67	14.79	4.38	18.95
			9 TM840	RIO TIMBO	1.104	1.360	0.609	1.024	8.58	9.40	6.84	8.28	33.38	25.85	18.94	26.06
RIO IRAJA	27.30	20	10 IJ200	RIO IRAJA	6.057	4.431	2.608	4.365	20.93	4.59	13.52	13.02	94.20	57.43	39.43	63.69
			11 IJ202	RIO IRAJA	1.123	1.160	1.119	1.134	4.08	2.00	2.90	2.99	20.38	5.01	8.70	11.36
			12 IJ210	RIO IRAJA	0.387	0.537	0.309	0.411	3.34	2.60	2.14	2.69	6.35	6.50	4.94	5.93
CANAL DO PENHA	-	20	13 PN180	CANAL DO PENHA	1.745	1.252	0.378	1.125	5.43	3.03	2.29	3.58	21.11	17.31	0.00	12.81
RIO S.J. DO MERITI	163.50	19	14 SJ220	RIO S.J. E MERITI	48.266	29.210	15.323	30.933	91.74	50.47	39.72	60.65	667.23	328.09	211.83	402.38
			15 AC241	RIO ACARI	7.278	6.048	5.891	6.406	33.96	2.09	15.27	17.11	81.75	15.68	71.26	56.23
			16 PD890	RIO DAS PEDRAS	1.481	1.786	0.927	1.398	8.70	8.64	4.81	7.38	37.11	26.23	12.81	25.39
			17 TG120	RIO TINGUI	0.652	0.631	0.500	0.594	2.25	2.83	3.89	2.99	10.70	8.18	16.42	11.77
			18 MG010	RIO MARANGA	2.731	3.064	1.747	2.514	14.16	15.88	6.79	12.28	40.11	37.06	16.60	31.26
			19 PV980	RIO PAVUNA	0.294	1.679	1.128	1.034	1.42	10.44	6.82	6.23	4.57	28.21	16.08	14.62
			20 PV982	RIO PAVUNA	0.515	0.816	0.174	0.502	2.85	3.10	1.35	2.43	7.56	6.35	1.65	5.19
RIO SARAPUI	159.80	17-6	21 SP300	RIO SARAPUI	38.100	25.065	13.698	25.621	72.42	51.97	35.51	53.30	296.27	108.28	76.93	160.49
			22 SP310	RIO SARAPUI	3.485	5.036	2.084	3.535	9.03	15.66	8.10	10.93	27.10	30.46	29.71	29.09
			23 SP330	RIO SARAPUI	1.989	4.439	2.007	2.812	4.12	7.67	6.94	6.24	15.47	15.34	13.87	14.89
RIO IGUACU	544.20	17-1	24 IA260	RIO IGUACU	62.442	41.842	26.266	43.517	19.42	14.46	22.69	18.86	1025.05	72.30	204.24	433.87
			25 IA270	RIO IGUACU	36.694	25.267	8.200	23.387	20.92	17.46	7.08	15.16	126.81	43.66	14.17	61.55
			26 IA280	RIO IGUACU	1.478	2.619	1.320	1.806	0.28	0.45	0.36	0.37	2.55	4.53	2.28	3.12
			27 BT040	RIO DA BOTA	2.537	2.969	1.669	2.392	7.89	4.10	7.21	6.40	17.54	12.83	21.63	17.33
			28 BT080	RIO DA BOTA	0.765	0.816	0.518	0.700	3.57	3.38	4.03	3.66	9.25	7.76	7.38	8.13
			29 PL380	RIO PILAR	2.506	1.438	0.944	1.629	5.63	0.99	2.45	3.02	10.83	3.73	4.49	6.35

Table APP. 4-1 Water Quality and Runoff Load of Detailed Survey on Major Highly Polluted Rivers on Clear Days

Runoff Load of seven(7) Rivers

Name	Basin Area (Km2)	NO.	NO	NAME	COD(Mn)Load (t/day) Nov. 1992 11-13	COD(Mn)Load (t/day) Nov. 1992 25-27	COD(Mn)Load (t/day) Apr. 1993 23-25	Mean Value	TN Load (t/day) Nov. 1992 11-13	TN Load (t/day) Nov. 1992 25-27	TN Load (t/day) Apr. 1993 23-25	Mean Value	TP Load (t/day) Nov. 1992 11-13	TP Load (t/day) Nov. 1992 25-27	TP Load (t/day) Apr. 1993 23-25	Mean Value
CANAL DO MANGUE	42.80	23	1 MN000	CANAL DO MANGUE	6.84	3.42	4.53	4.93	13.81	3.63	4.77	7.41	1.64	0.55	0.47	0.89
			2 MN001	CANAL DO MANGUE	0.18	0.31	0.06	0.18	0.29	0.53	0.14	0.32	0.06	0.07	0.01	0.05
			3 CM030	RIO ESTRELA	0.48	0.42	0.17	0.35	0.86	0.86	0.40	0.71	0.09	0.08	0.04	0.07
			4 TR060	RIO TRAPICHEIRO	0.17	0.32	0.18	0.23	0.51	0.65	0.37	0.51	0.07	0.06	0.05	0.06
			5 MR042	RIO MARACANA	1.13	0.94	0.21	0.76	1.41	1.98	0.47	1.29	0.20	0.21	0.06	0.16
CANAL DO CUNHA	60.50	21	6 CN100	CANAL DO CUNHA	34.70	16.20	2.32	17.74	28.13	29.04	1.90	18.03	2.89	3.06	0.20	2.05
			7 JC120	RIO JACARI	2.31	0.83	0.77	1.30	2.16	1.83	1.98	1.99	0.35	0.20	0.20	0.25
			8 FR142	RIO FARIA	2.15	1.10	0.13	1.13	5.78	2.46	0.35	2.87	0.47	0.20	0.04	0.24
			9 TM840	RIO TIMBO	2.67	1.39	1.32	1.79	2.00	2.12	0.79	1.64	0.33	0.24	0.10	0.22
RIO IRAJA	27.30	20	10 IJ200	RIO IRAJA	11.51	2.60	3.97	6.03	7.85	0.69	4.07	4.20	1.05	0.57	0.36	0.66
			11 IJ202	RIO IRAJA	0.78	1.12	0.58	0.83	1.55	1.30	1.64	1.50	0.24	0.15	0.15	0.18
			12 IJ210	RIO IRAJA	0.60	0.52	0.61	0.58	0.67	0.88	0.46	0.67	0.08	0.09	0.05	0.07
CANAL DO PENHA	-	20	13 PN180	CANAL DO PENHA	1.51	1.10	0.51	1.04	2.71	1.19	0.56	1.49	0.38	0.22	0.05	0.21
RIO S.J. DO MERITI	163.50	19	14 SJ220	RIO S.J. E MERITI	8.34	22.21	7.15	12.57	50.04	21.45	18.54	30.01	8.34	3.79	1.85	4.66
			15 AC241	RIO ACARI	5.03	4.18	2.85	4.02	9.43	5.23	4.60	6.42	1.26	0.78	0.61	0.88
			16 PD890	RIO DAS PEDRAS	2.56	1.82	0.46	1.61	2.43	2.78	0.80	2.00	0.45	0.31	0.12	0.29
			17 TG120	RIO TINGUI	0.11	0.53	0.27	0.30	0.62	0.55	0.74	0.63	0.08	0.08	0.06	0.08
			18 MG010	RIO MARANGA	0.94	2.75	0.91	1.53	2.60	2.91	1.97	2.49	0.47	0.53	0.21	0.40
			19 PV980	RIO PAVUNA	0.30	1.51	0.57	0.79	0.46	2.61	1.86	1.64	0.06	0.29	0.17	0.17
			20 PV982	RIO PAVUNA	0.44	0.80	0.08	0.44	0.49	0.49	0.35	0.44	0.09	0.11	0.03	0.07
RIO SARAPUI	159.80	17-6	21 SP300	RIO SARAPUI	28.97	23.39	16.57	22.98	31.27	11.91	14.24	19.14	8.23	4.33	1.66	4.74
			22 SP310	RIO SARAPUI	3.97	4.70	3.15	3.94	3.31	4.35	2.89	3.52	0.45	0.87	0.34	0.55
			23 SP330	RIO SARAPUI	2.06	4.14	1.14	2.45	1.55	2.30	1.74	1.86	0.26	0.03	0.24	0.18
RIO IGUACU	544.20	17-1	24 IA260	RIO IGUACU	32.37	40.49	11.80	28.22	11.87	6.51	6.86	8.41	2.43	1.81	1.25	1.83
			25 IA270	RIO IGUACU	11.41	20.52	3.54	11.83	1.90	2.62	2.21	2.24	3.17	0.76	0.46	1.46
			26 IA280	RIO IGUACU	0.59	1.58	0.39	0.85	0.13	0.91	0.07	0.37	0.04	0.06	0.02	0.04
			27 BT040	RIO DA BOTA	3.07	2.57	2.08	2.57	3.07	1.67	1.59	2.11	0.33	0.38	0.25	0.32
			28 BT080	RIO DA BOTA	1.08	2.26	0.96	1.43	1.19	0.10	0.67	0.65	0.20	0.18	0.09	0.15
			29 PL380	RIO PILAR	1.39	1.14	0.44	0.99	0.35	0.15	0.30	0.26	0.22	0.12	0.09	0.14

Table APP. 4-1 Water Quality and Runoff Load of Detailed Survey on Major Highly Polluted Rivers on Clear Days

Runoff Load of seven(7) Rivers (11-13 Nov. 1992)

NO	NAME	Governing Basin Area (Km2)	NO.	Discharge (m3/s)	Water Quality BOD (mg/l)	COD(Cr) (mg/l)	COD(Mn) (mg/l)	TN (mg/l)	TP (mg/l)	Runoff Load BOD Load (t/day)	COD(Cr)Load (t/day)	COD(Mn)Load (t/day)	TN Load (t/day)	TP Load (t/day)
1 MN000	CANAL DO MANGUE	42.80	23	7.614	240.0	360.0	10.4	21.00	2.50	157.88	236.83	6.84	13.81	1.64
2 MN001	CANAL DO MANGUE			0.338	72.0	110.0	6.2	10.00	2.00	2.10	3.21	0.18	0.29	0.06
3 CM030	RIO ESTRELA			0.526	96.0	190.0	10.6	19.00	2.00	4.36	8.63	0.48	0.86	0.09
4 TR060	RIO TRAPICHEIRO			0.420	92.0	130.0	4.8	14.00	1.90	3.34	4.72	0.17	0.51	0.07
5 MR042	RIO MARACANA			1.167	48.0	190.0	11.2	14.00	2.00	4.84	19.16	1.13	1.41	0.20
6 CN100	CANAL DO CUNHA	60.50	21	22.311	16.0	130.0	18.0	12.00	1.50	30.84	250.60	34.70	23.13	2.89
7 JC120	RIO JACARI			0.893	86.0	330.0	30.0	28.00	4.50	6.64	25.46	2.31	2.16	0.35
8 FR142	RIO FARIA			1.557	84.0	280.0	16.0	43.00	3.50	11.30	37.67	2.15	5.78	0.47
9 TM840	RIO TIMBO			1.104	90.0	350.0	28.0	21.00	3.50	8.58	33.38	2.67	2.00	0.33
10 IJ200	RIO IRAJA	27.30	20	6.057	40.0	180.0	22.0	15.00	2.00	20.93	94.20	11.51	7.85	1.05
11 IJ202	RIO IRAJA			1.123	42.0	210.0	8.0	16.00	2.50	4.08	20.38	0.78	1.55	0.24
12 IJ210	RIO IRAJA			0.387	100.0	190.0	18.0	20.00	2.50	3.34	6.35	0.60	0.67	0.08
13 PN180	CANAL DO PENHA	-	20	1.745	36.0	140.0	10.0	18.00	2.50	5.43	21.11	1.51	2.71	0.38
14 SJ220	RIO S.J. E MERITI	165.50	19	48.266	22.0	160.0	2.0	12.00	2.00	91.74	667.23	8.34	50.04	8.34
15 AC241	RIO ACARI			7.278	54.0	130.0	8.0	15.00	2.00	33.96	81.75	5.03	9.43	1.26
16 PD890	RIO DAS PEDRAS			1.481	68.0	290.0	20.0	19.00	3.50	8.70	37.11	2.56	2.43	0.45
17 TG120	RIO TINGUI			0.652	40.0	190.0	2.0	11.00	1.50	2.25	10.70	0.11	0.62	0.08
18 MG010	RIO MARANGA			2.731	60.0	170.0	4.0	11.00	2.00	14.16	40.11	0.94	2.60	0.47
19 PV980	RIO PAVUNA			0.294	56.0	180.0	12.0	18.00	2.50	1.42	4.57	0.30	0.46	0.06
20 PV982	RIO PAVUNA			0.515	64.0	170.0	10.0	11.00	2.00	2.85	7.56	0.44	0.49	0.09
21 SP300	RIO SARAPUI	159.80	17-6	38.100	22.0	90.0	8.8	9.50	2.50	72.42	296.27	28.97	31.27	8.23
22 SP310	RIO SARAPUI			3.485	30.0	90.0	13.2	11.00	1.50	9.03	27.10	3.97	3.31	0.45
23 SP330	RIO SARAPUI			1.989	24.0	90.0	12.0	9.00	1.50	4.12	15.47	2.06	1.55	0.26
24 IA260	RIO IGUACU	544.20	17-1~5	62.442	3.6	190.0	6.0	2.20	0.45	19.42	1025.05	32.37	11.87	2.43
25 IA270	RIO IGUACU			36.694	6.6	40.0	3.6	0.60	1.00	20.92	126.81	11.41	1.90	3.17
26 IA280	RIO IGUACU			1.478	2.2	20.0	4.6	1.00	0.30	0.28	2.55	0.59	0.13	0.04
27 BT040	RIO DA BOTA			2.537	36.0	80.0	14.0	14.00	1.50	7.89	17.54	3.07	3.07	0.33
28 BT080	RIO DA BOTA			0.765	54.0	140.0	16.4	18.00	3.00	3.57	9.25	1.08	1.19	0.20
29 PL380	RIO PILAR			2.506	26.0	50.0	6.4	1.60	1.00	5.63	10.83	1.39	0.35	0.22

Table APP. 4-1 Water Quality and Runoff Load of Detailed Survey on Major Highly Polluted Rivers on Clear Days

Runoff Load of seven(7) Rivers (23-25 Nov.1992)

NO	NAME	Governing Basin Area (Km2)	NO.	Discharge (m3/s)	Water Quality BOD (mg/l)	COD(Cr) (mg/l)	COD(Mn) (mg/l)	TN (mg/l)	TP (mg/l)	Runoff Load BOD Load (t/day)	COD(Cr)Load (t/day)	COD(Mn)Load (t/day)	TN Load (t/day)	TP Load (t/day)
1 MN000	CANAL DO MANGUE	42.80	23	4.207	56.0	140.0	9.4	10.00	1.50	20.36	50.89	3.42	3.63	0.55
2 MN001	CANAL DO MANGUE			0.340	250.0	470.0	10.4	18.00	2.50	7.34	13.81	0.31	0.53	0.07
3 CM030	RIO ESTRELA			0.473	84.0	210.0	10.2	21.00	2.00	3.43	8.58	0.42	0.86	0.08
4 TR060	RIO TRAPICHEIRO			0.360	84.0	180.0	10.4	21.00	2.00	2.61	5.60	0.32	0.65	0.06
5 MR042	RIO MARACANA			0.994	80.0	220.0	11.0	23.00	2.50	6.87	18.89	0.94	1.98	0.21
6 CN100	CANAL DO CUNHA	60.50	21	17.692	28.0	120.0	10.6	19.00	2.00	42.80	183.43	16.20	29.04	3.06
7 JC120	RIO JACARI			0.920	105.0	320.0	10.4	23.00	2.50	8.35	25.44	0.83	1.83	0.20
8 FR142	RIO FARIA			1.141	56.0	150.0	11.2	25.00	2.00	5.52	14.79	1.10	2.46	0.20
9 TM840	RIO TIMBO			1.360	80.0	220.0	11.8	18.00	2.00	9.40	25.85	1.39	2.12	0.24
10 IJ200	RIO IRAJA	27.30	20	4.431	12.0	150.0	6.8	1.80	1.50	4.59	57.43	2.60	0.69	0.57
11 IJ202	RIO IRAJA			1.160	20.0	50.0	11.2	13.00	1.50	2.00	5.01	1.12	1.30	0.15
12 IJ210	RIO IRAJA			0.537	56.0	140.0	11.2	19.00	2.00	2.60	6.50	0.52	0.88	0.09
13 PN180	CANAL DO PENHA	-	20	1.252	28.0	160.0	10.2	11.00	2.00	3.03	17.31	1.10	1.19	0.22
14 SJ220	RIO S.J. E MERITI	163.50	19	29.210	20.0	130.0	8.8	8.50	1.50	50.47	328.09	22.21	21.45	3.79
15 AC241	RIO ACARI			6.048	4.0	30.0	8.0	10.00	1.50	2.09	15.68	4.18	5.23	0.78
16 PD890	RIO DAS PEDRAS			1.786	56.0	170.0	11.8	18.00	2.00	8.64	26.23	1.82	2.78	0.31
17 TG120	RIO TINGUI			0.631	52.0	150.0	9.8	10.00	1.50	2.83	8.18	0.53	0.55	0.08
18 MG010	RIO MARANGA			3.064	60.0	140.0	10.4	11.00	2.00	15.88	37.06	2.75	2.91	0.53
19 PV980	RIO PAVUNA			1.679	72.0	160.0	10.4	18.00	2.00	10.44	23.21	1.51	2.61	0.29
20 PV982	RIO PAVUNA			0.816	44.0	90.0	11.4	7.00	1.50	3.10	6.35	0.80	0.49	0.11
21 SP300	RIO SARAPUI	159.80	17-6	25.065	24.0	50.0	10.8	5.50	2.00	51.97	108.28	23.39	11.91	4.33
22 SP310	RIO SARAPUI			5.036	36.0	70.0	10.8	10.00	2.00	15.66	30.46	4.70	4.35	0.87
23 SP330	RIO SARAPUI			4.439	20.0	40.0	10.8	6.00	0.07	7.67	15.34	4.14	2.30	0.03
24 IA260	RIO IGUACU	544.20	17-15	41.842	4.0	20.0	11.2	1.80	0.50	14.46	72.30	40.49	6.51	1.81
25 IA270	RIO IGUACU			25.267	8.0	20.0	9.4	1.20	0.35	17.46	43.66	20.52	2.62	0.76
26 IA280	RIO IGUACU			2.619	2.0	20.0	7.0	4.00	0.25	0.45	4.53	1.58	0.91	0.06
27 BT040	RIO DA BOTA			2.969	16.0	50.0	10.0	6.50	1.50	4.10	12.83	2.57	1.67	0.38
28 BT080	RIO DA BOTA			0.816	48.0	110.0	32.0	1.40	2.50	3.38	7.76	2.26	0.10	0.18
29 PL380	RIO PILAR			1.438	8.0	30.0	9.2	1.20	1.00	0.99	3.73	1.14	0.15	0.12

Table APP. 4-1 Water Quality and Runoff Load of Detailed Survey on Major Highly Polluted Rivers on Clear Days

Runoff Load of seven(7) Rivers (25-27 Apr. 1993)

NO	NAME	Basin Area (Km2)	NO.	Discharge (m3/s)	Water Quality BOD (mg/l)	COD(Cr) (mg/l)	COD(Mn) (mg/l)	TN (mg/l)	TP (mg/l)	Runoff Load BOD Load (t/day)	COD(Cr)Load (t/day)	COD(Mn)Load (t/day)	TN Load (t/day)	TP Load (t/day)
1 MN000	CANAL DO MANGUE	42.80	23	4.227	30.0	190.0	12.4	13.05	1.30	10.96	69.39	4.53	4.77	0.47
2 MN001	CANAL DO MANGUE			0.102	190.0	380.0	6.8	16.04	1.30	1.67	3.35	0.06	0.14	0.01
3 CM030	RIO ESTRELA			0.356	90.0	290.0	5.4	13.03	1.45	2.77	8.92	0.17	0.40	0.04
4 TR060	RIO TRAPICHEIRO			0.354	90.0	300.0	6.0	12.04	1.60	2.75	9.18	0.18	0.37	0.05
5 MR042	RIO MARACANA			0.455	80.0	200.0	5.4	12.04	1.50	3.14	7.86	0.21	0.47	0.06
6 CN100	CANAL DO CUNHA	60.50	21	1.681	50.0	130.0	16.0	13.09	1.35	7.26	18.88	2.32	1.90	0.20
7 JC120	RIO JACARI			1.349	120.0	330.0	6.6	17.01	1.75	13.99	38.46	0.77	1.98	0.20
8 FR142	RIO FARIA			0.290	65.0	175.0	5.2	14.04	1.60	1.63	4.38	0.13	0.35	0.04
9 TM840	RIO TIMBO			0.609	130.0	360.0	25.0	15.07	1.90	6.84	18.94	1.32	0.79	0.10
10 IJ200	RIO IRAJA	27.30	20	2.608	60.0	175.0	17.6	18.08	1.60	13.52	39.43	3.97	4.07	0.36
11 IJ202	RIO IRAJA			1.119	30.0	90.0	6.0	17.00	1.50	2.90	8.70	0.58	1.64	0.15
12 IJ210	RIO IRAJA			0.309	80.0	185.0	22.8	17.06	1.70	2.14	4.94	0.61	0.46	0.05
13 PN180	CANAL DO PENHA	-	20	0.378	70.0		15.6	17.07	1.40	2.29	0.00	0.51	0.56	0.05
14 SJ220	RIO S.J. E MERITI	163.50	19	15.323	30.0	160.0	5.4	14.00	1.40	39.72	211.83	7.15	18.54	1.85
15 AC241	RIO ACARI			5.891	30.0	140.0	5.6	9.04	1.20	15.27	71.26	2.85	4.60	0.61
16 PD890	RIO DAS PEDRAS			0.927	60.0	160.0	5.8	10.08	1.50	4.81	12.81	0.46	0.80	0.12
17 TG120	RIO TINGUI			0.500	90.0	380.0	6.2	17.04	1.50	3.89	16.42	0.27	0.74	0.06
18 MG010	RIO MARANGA			1.747	45.0	110.0	6.0	13.04	1.40	6.79	16.60	0.91	1.97	0.21
19 PV980	RIO PAVUNA			1.128	70.0	165.0	5.8	19.04	1.75	6.82	16.08	0.57	1.86	0.17
20 PV982	RIO PAVUNA			0.174	90.0	110.0	5.6	23.03	1.70	1.35	1.65	0.08	0.35	0.03
21 SP300	RIO SARAPUI	159.80	17-6	13.698	30.0	65.0	14.0	12.03	1.40	35.51	76.93	16.57	14.24	1.66
22 SP310	RIO SARAPUI			2.084	45.0	165.0	17.5	16.04	1.90	8.10	29.71	3.15	2.89	0.34
23 SP330	RIO SARAPUI			2.007	40.0	80.0	6.6	10.03	1.40	6.94	13.87	1.14	1.74	0.24
24 IA260	RIO IGUACU	544.20	17-1 5	26.266	10.0	90.0	5.2	3.02	0.55	22.69	204.24	11.80	6.86	1.25
25 IA270	RIO IGUACU			8.200	10.0	20.0	5.0	3.12	0.65	7.08	14.17	3.54	2.21	0.46
26 IA280	RIO IGUACU			1.320	3.2	20.0	3.4	0.57	0.20	0.36	2.28	0.39	0.07	0.02
27 BT040	RIO DA BOTA			1.669	50.0	150.0	14.4	11.04	1.70	7.21	21.63	2.08	1.59	0.25
28 BT080	RIO DA BOTA			0.518	90.0	165.0	21.5	15.05	2.00	4.03	7.38	0.96	0.67	0.09
29 PL380	RIO PILAR			0.944	30.0	55.0	5.4	3.63	1.15	2.45	4.49	0.44	0.30	0.09

Table APP. 4-2 Results of River Water Quality Analysis of Detailed Survey

11~13 NOV 1992

First sampling		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date of sampling	NOV.92	11/11	11/11	11/11	11/11	11/11	12/11	12/11	12/11	12/11	12/11	12/11	12/11	12/11	12/11
General number of the laboratory		12993	12994	12992	12990	12991	13001	13006	13007	13008	13003	13009	13005	13002	13004
Station		MN-000	MN-001	CN-030	TR-060	MR-042	CN-100	JC-120	FR-142	TM-840	IJ-200	IJ-202	IJ-210	PN-180	SJ-220
CODE PARAMETER	UNITY	Canal do Mangue	Canal do Mangue	R. Comprido	R. Trapicheiros	R. Maracana	Canal do Cunha	Rio Jacare	Rio Faria	Rio Timbo	Rio Iraja	Rio Iraja	Rio Iraja	Canal da Penha	R. S. Joao Meriti
Time	H	11.35	12.00	11.20	10.25	10.50	8.55	11.35	11.55	12.15	10.10	12.45	11.00	9.45	10.30
02062F Air temperature	C	33.00	33.00	30.00	32.00	32.00	30.50	37.00	36.00	37.00	33.00	37.00	35.00	34.50	35.00
02061F Water temperature	C	26.00	25.64	24.60	24.73	24.62	25.36	27.26	29.50	29.56	26.26	30.39	27.56	26.12	26.70
02080F Transp. (tube)	cm														
02043F Conduct. (field)	mS/cm	0.39	1.60	0.38	0.37	0.33	2.35	0.50	0.37	0.53	2.83	0.48	0.44	2.16	3.93
17300F Salinity (field)	%	0.18	0.80	0.18	0.18	0.16	1.16	0.23	0.17	0.23	1.39	0.21	0.20	1.08	2.30
10300F pH (field)		6.62	7.13	7.37	7.33	7.36	7.17	7.21	8.99	7.44	7.25	7.54	7.33	7.23	7.18
08102F DO (field)	mg/l	0.1	0.0	0.8	1.5	0.7	0.1	0.1	2.0	0.1	0.1	0.1	0.2	0.1	0.1
08202L BOD (total)	mg/l	240	72	96	92	48	16	86	84	90	40	42	100	36	22
08301L COD (total)	mg/l	360	110	190	130	190	130	330	280	350	160	210	190	140	160
15408L Total Phosphorus	mg P/l	2.50	2.00	2.00	1.90	2.00	1.50	4.50	3.50	3.50	2.00	2.50	2.50	2.50	2.00
07008L Kjeldahl Nitrogen	mg N/l	21.0	10.0	19.0	14.0	14.0	12.0	28.0	43.0	21.0	15.0	16.0	20.0	18.0	12.0
08402L Total OC alcaline	mg/l	10.4	6.2	10.6	4.8	11.2	18.0	30.0	16.0	28.0	22.0	8.0	18.0	10.0	2.0
10401L Suspended Solids	mg/l	140	42	200	100	140	90	320	370	240	24	70	100	40	35
08306L TOC	mg/l														

First sampling		15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Date of sampling	NOV.92	12/11	12/11	12/11	12/11	12/11	12/11	13/11	13/11	13/11	13/11	13/11	13/11	13/11	13/11	13/11
General number of the laboratory		13011	13010	13015	13014	13012	13013	13031	13036	13037	13032	13034	13039	13035	13038	13033
Station		AC-241	PD-890	TG-120	MG-010	PV-980	PV-982	SP-300	SP-310	SP-330	IA-260	IA-270	IA-280	BT-040	BT-080	PL-380
CODE PARAMETER	UNITY	Rio Acari	Rio das Pedras	Rio Tinguá	Rio Maranga	Rio Pavuna	Rio Pavuna	Rio Sarapui	Rio Sarapui	Rio Sarapui	R. Iguacu	R. Iguacu	R. Iguacu	Rio da Bota	Rio da Bota	Rio Pilar
Time	H	15.20	14.30	17.00	16.30	15.45	16.10	8.55	11.30	12.00	9.30	10.25	13.15	11.00	12.35	10.00
02062F Air temperature	C	34.00	37.00	35.00	34.00	35.00	35.50	32.50	34.50	37.00	32.50	31.00	35.00	34.50	35.00	30.00
02061F Water temperature	C	30.21	29.96	26.74	28.92	31.28	29.08	25.92	28.84	28.59	28.37	27.12	26.54	27.40	29.84	26.74
02080F Transp. (tube)	cm															
02043F Conduct. (field)	mS/cm	0.53	0.56	0.37	0.41	0.56	0.41	0.03	0.45	0.39	5.89	0.17	0.09	0.44	0.62	0.53
17300F Salinity (field)	%	0.23	0.25	0.17	0.18	0.25	0.18	0.02	0.20	0.18	2.97	0.08	0.05	0.20	0.27	0.24
10300F pH (field)		7.28	7.39	7.22	7.88	7.16	7.12	7.08	7.39	7.45	6.84	6.93	7.13	7.20	7.53	6.92
08102F DO (field)	mg/l	0.2	0.1	0.7	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	6.3	0.1	0.2	0.1
08202L BOD (total)	mg/l	54	58	40	60	56	64	22	30	24	3.6	6.6	2.2	36	54	25
08301L COD (total)	mg/l	130	290	190	170	180	170	90	90	90	190	40	20	80	140	50
15408L Total Phosphorus	mg P/l	2.00	3.50	1.50	2.00	2.50	2.00	2.50	1.50	1.50	0.45	1.00	0.30	1.50	3.00	1.00
07008L Kjeldahl Nitrogen	mg N/l	15.0	19.0	11.0	11.0	18.0	11.0	9.5	11.0	9.0	2.2	0.6	1.0	14.0	18.0	1.5
08402L Total OC alcaline	mg/l	8.0	20.0	2.0	4.0	12.0	10.0	8.8	13.2	12.0	6.0	3.6	4.6	14.0	16.4	6.4
10401L Suspended Solids	mg/l	60	80	60	60	40	100	30	50	75	210	16	20	55	140	22
08306L TOC	mg/l															

Table APP. 4-2 Results of River Water Quality Analysis of Detailed Survey

23~25 NOV 1992

Second sampling		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date of sampling	NOV. 92	23/11	23/11	23/11	23/11	23/11	23/11	23/11	23/11	23/11	25/11	25/11	25/11	25/11	25/11
General number of the laboratory		13584	13585	13579	13577	13578	13583	13580	13581	13582	13692	13695	13694	13691	13693
Station		MN-000	MN-001	CN-030	TR-060	MR-042	CN-100	JC-120	PR-142	TM-840	IJ-200	IJ-202	IJ-210	PN-180	SJ-220
CODE PARAMETER	UNITY	Canal do Mangue	Canal do Mangue	R. Com prido	R. Trapi-cheiros	R. Mara-cana	Canal do Cunha	Jacare	Rio Fa-ria	Rio Tim-bo	Rio Ira-ja	Rio Ira-ja	Rio Ira-ja	Canal da Penha	R. S. Joao Meriti
Time	H	17.30	17.55	10.05	9.25	9.50	14.45	10.35	10.55	11.15	9.10	10.30	10.05	8.45	9.30
02062F Air temperature	C	36.00	36.00	30.00	30.00	30.00	30.50	30.50	30.50	30.00	28.00	29.00	28.00	28.00	28.00
02061F Water temperature	C	26.50	26.57	26.09	26.50	26.15	27.24	27.18	27.50	27.12	25.49	26.41	26.09	25.67	25.34
02080F Transp. (tube)	*cm*	*5.0*	*2.5*	*4.0*	*6.0*	*5.0*	*8.0*	*5.0*	*6.0*	*4.0*	*0.5*	*0.6*	*0.5*	*0.5*	*0.6*
02043F Conduct. (field)	mS/cm	4.51	0.36	0.41	0.42	0.37	2.39	0.47	0.45	0.45	3.76	0.39	0.31	3.95	3.92
17300F Salinity (field)	%	0.75	0.17	0.19	0.20	0.18	1.16	0.22	0.22	0.21	2.03	0.15	0.14	2.09	1.95
10300F pH (field)		7.13	6.48	7.50	7.53	7.58	7.14	7.27	8.0	7.36	7.20	7.54	7.46	7.26	7.29
08102F DO (field)	mg/l	0.4	0.2	1.8	1.8	0.7	0.2	0.2	0.2	0.5	0.8	0.6	0.6	0.4	0.4
08202L BOD (total)	mg/l	56	250	84	84	80	28	105	56	80	12	20	56	28	20
08301L COD (total)	mg/l	140	470	210	180	220	120	320	150.00	220	150	50	140	160	130
15408L Total Phosphorus	mg P/l	1.50	2.50	2.00	2.00	2.50	2.00	2.50	2.00	2.00	1.50	1.50	2.00	2.00	1.50
07008L Kjeldahl Nitrogen	mg N/l	10.00	18.00	21.00	21.00	23.00	19.00	23.00	25.0	18.00	1.80	13.00	19.00	11.00	8.50
08402L Total OC alcaline	mg/l	9.4	10.4	10.2	10.4	11.0	10.6	10.4	11.2	11.8	6.8	11.2	11.2	10.2	8.8
10401L Suspended Solids	mg/l	30	130	90	80	80	20	140	80	190	16	50	90	22	60
08306L TOC	mg/l														

Second sampling		15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Date of sampling	NOV. 92	25/11	25/11	25/11	25/11	25/11	25/11	26/11	26/11	26/11	26/11	26/11	26/11	26/11	26/11	26/11
General number of the laboratory		13696	13697	13701	13700	13698	13699	13856	13861	13862	13857	13859	13864	13860	13863	13858
Station		AC-241	PD-890	TG-120	MG-010	PV-980	PV-982	SP-300	SP-310	SP-330	IA-260	IA-270	IA-280	BT-060	BT-080	PL-380
CODE PARAMETER	UNITY	Rio Aca-ri	Rio das Pedras	Rio Tin-gui	Rio Ma-ranga	Rio Pa-vuna	Rio Pa-vuna	Rio Sa-rapui	Rio Sa-rapui	Rio Sa-rapui	R. Iguacu	Rio Iguac	R. Iguacu	Rio da Bota	Rio da Bota	Rio Pi-lar
Time	H	10.55	11.40	14.55	14.35	14.00	14.20	9.20	11.15	11.40	9.35	10.30	12.40	10.50	12.05	10.00
02062F Air temperature	C	30.00	30.00	32.00	32.00	32.00	32.00	28.00	31.00	31.00	27.50	29.00	29.00	31.00	30.00	28.00
02061F Water temperature	C	25.99	26.61	27.44	27.85	27.89	26.70	26.16	26.26	25.81	25.48	24.66	24.28	26.07	27.04	25.29
02080F Transp. (tube)	cm	0.8	0.6	0.5	0.5	0.6	0.7									
02043F Conduct. (field)	mS/cm	0.36	0.45	0.36	0.36	0.45	0.31	0.5	0.34	0.3	0.89	0.09	0.06	0.42	0.55	0.36
17300F Salinity (field)	%	0.17	0.21	0.17	0.16	0.21	0.15	0.24	0.16	0.14	0.43	0.05	0.04	0.20	0.25	0.17
10300F pH (field)		7.37	7.55	7.31	7.30	7.32	7.07	7.11	7.42	7.45	6.92	6.86	7.08	7.35	7.31	6.89
08102F DO (field)	mg/l	0.5	1.1	0.9	0.3	0.4	0.6	0.4	0.4	0.3	0.3	2.4	6.1	1.3	0.5	0.3
08202L BOD (total)	mg/l	4	56	52	60	72	44	24	36	20	4	8	2	16	48	8
08301L COD (total)	mg/l	30	170	150	140	160	90	50	70	40	20	20	20	50	110	30
15408L Total Phosphorus	mg P/l	1.50	2.00	1.50	2.00	2.00	1.50	2.00	2.00	0.07	0.50	0.35	0.25	1.50	2.50	1.00
07008L Kjeldahl Nitrogen	mg N/l	10.00	18.00	10.00	11.00	18.00	7.00	5.50	10.00	6.00	1.80	1.20	4.00	6.50	1.40	1.20
08402L Total OC alcaline	mg/l	8.0	11.8	9.8	10.4	10.4	11.4	10.8	10.8	10.8	11.2	9.4	7.0	10.0	32.0	9.2
10401L Suspended Solids	mg/l	36	50	60	270	80	38	90	260	100	55	50	32	60	80	26
08306L TOC	mg/l															

Table APP. 4-2 Results of River Water Quality Analysis of Detailed Survey

25~27 APR 1993

First sampling		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date of sampling	APR. 93	25/04	25/04	25/04	25/04	25/04	25/04	25/04	25/04	25/04	25/04	25/ 04	25/04	25/04	26/04
General number of the laboratory		5892	5904	5903	5901	5902	5893	5900	5898	5899	5894	5896	5895	5897	5959
Station		MN-000	MN-001	CN-030	TR-060	MR-042	CN-100	JC-120	FR-142	TM-840	IJ-200	IJ-202	IJ-210	PN-180	SJ-220
CODE PARAMETER	UNITY	Canal do Mangue	Canal do Mangue	R. Comprido	R. Trapicheiros	R. Maracana	Canal do Cunha	Rio Jacare	Rio Faria	Rio Timbo	Rio Irajа	Rio Irajа	Rio Irajа	Canal da Penha	R. S. Joao Meriti
Time	H	9.20	15.20	15.00	14.25	14.35	10.00	12.50	12.00	12.30	10.35	11.20	10.55	11.45	10.00
02062F Air temperature	C	28.50	29.50	30.00	30.00	31.50	28.00	32.00	31.00	33.00	31.00	32.00	31.50	33.00	30.00
02061F Water temperature	C	26.77	27.67	26.80	27.47	27.42	27.14	29.18	29.75	29.53	28.07	29.67	28.56	29.30	26.69
02080F Transp. (tube)	cm	8.0	2.5	2.5	5.0	6.0	6.0	2.5	5.0	2.5	7.0	7.0	5.0	8.0	5.0
02043F Conduct. (field)	mS/cm	3.08	0.24	0.16	0.33	0.27	2.12	0.41	0.49	0.39	8.17	0.31	0.34	19.50	7.82
17300F Salinity (field)	‰	1.56	0.11	0.12	0.14	0.12	1.05	0.18	0.21	0.17	3.41	0.14	0.16	10.26	4.51
10300F pH (field)		6.67	5.91	6.55	6.51	6.55	6.54	6.47	7.63	6.49	6.65	6.80	6.56	6.59	6.51
08102F DO (field)	mg/l	0.2	1.3	1.1	4.3	0.9	0.2	0.2	0.1	0.2	0.1	0.3	0.2	0.1	0.2
08202L BOD (total)	mg/l	30	190	90	90	80	50	120	65	130	60	30	80	70	30
08301L COD (total)	mg/l	190	380	290	300	200	130	330	175	360	175	90	185		160
15408L Total Phosphorus	mg P/l	1.30	1.30	1.45	1.60	1.50	1.35	1.75	1.60	1.90	1.60	1.50	1.70	1.40	1.41
07309L Nitrate Nitrogen	mg N/l	0.05	0.40	0.03	0.03	0.03	0.08	<0.01	0.07	0.07	<0.01	0.05	0.07	<0.01	0.03
07209L Nitrite Nitrogen	mg N/l	0.003	0.004	0.004	0.006	0.005	0.009	0.007	0.003	0.005	0.002	0.008	0.004	0.002	0.005
07008L Kjeldahl Nitrogen	mg N/l	13.00	16.00	13.00	12.00	12.00	13.00	17.00	15.00	18.00	17.00	17.00	17.00	14.00	9.00
07801L Total Nitrogen	mg N/l	13.05	16.04	13.03	12.04	12.04	13.09	17.01	15.07	18.08	17.00	17.06	17.07	14.00	9.04
08402L Total OC alcaline	mg/l	12.4	6.8	5.4	6.0	5.4	16.0	6.6	5.2	25.0	17.6	6.0	22.8	15.6	5.4
10401L Suspended Solids	mg/l	60	60	50	40	40	10	50	50	132	10	20	45	30	12
08305L TOC	mg/l														

First sampling		15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Date of sampling	APR. 93	26/04	26/04	26/03	26/03	26/04	26/04	27/04	27/04	27/04	27/04	27/04	27/04	27/04	27/04	27/04
General number of the laboratory		5961	5960	5965	5964	5962	5963	6053	6058	6059	6054	6056	6061	6057	6060	6055
Station		AC-241	PD-890	TG-120	MG-010	PV-980	PV-982	SP-300	SP-310	SP-330	IA-260	IA-270	IA-280	BT-040	BT-080	PL-380
CODE PARAMETER	UNITY	Rio Acari	Rio das Pedras	Rio Tinguа	Rio Maranga	Rio Pavuna	Rio Pavuna	Rio Sarapui	Rio Sarapui	Rio Sarapui	R. Iguacu	R. Iguacu	R. Iguacu	Rio da Bota	Rio da Bota	Rio Pilar
Time	H	11.35	11.05	13.20	12.55	12.05	12.35	9.25	11.50	12.20	9.50	10.40	13.35	11.20	12.55	10.20
02062F Air temperature	C	33.00	31.50	35.00	34.50	32.00	32.00	29.00	32.00	34.00	29.00	32.00	31.00	33.00	32.00	32.00
02061F Water temperature	C	27.38	27.62	27.78	28.03	28.63	27.60	26.84	28.69	27.49	25.89	25.75	24.94	27.00	27.73	25.11
02080F Transp. (tube)	cm	6.0	6.0	5.0	7.0	5.0	5.0	2.0	5.0	5.0	12.0	7.0	11.0	7.0	1.0	5.0
02043F Conduct. (field)	mS/cm	0.47	0.34	0.28	0.22	0.42	0.42	0.58	0.36	0.27	2.23	0.06	0.00	0.31	0.45	0.34
17300F Salinity (field)	‰	0.22	0.17	0.13	0.10	0.19	0.19	0.27	0.16	0.12	1.10	0.04	0.01	0.15	0.21	0.17
10300F pH (field)		6.54	6.59	6.45	6.48	6.60	6.49	6.25	6.63	6.61	6.02	5.63	6.05	6.03	6.42	6.00
08102F DO (field)	mg/l	0.3	0.2	0.8	0.3	0.3	0.4	0.2	0.2	0.2	1.0	0.1	6.3	0.1	0.3	0.1
08202L BOD (total)	mg/l	30	60	90	45	70	90	30	45	40	10	10	3.2	50	90	30
08301L COD (total)	mg/l	140	160	380	110	165	110	65	165	80	90	20	20	150	165	55
15408L Total Phosphorus	mg P/l	1.20	1.50	1.50	1.40	1.75	1.70	1.40	1.90	1.40	0.55	0.65	0.20	1.70	2.00	1.15
07309L Nitrate Nitrogen	mg N/l	0.03	0.03	0.02	0.04	0.03	0.02	0.02	0.04	0.03	0.02	0.10	0.30	0.04	0.05	0.03
07209L Nitrite Nitrogen	mg N/l	0.002	0.010	0.020	0.004	0.010	0.010	0.008	0.002	0.002	0.001	0.020	0.02	0.003	<0.001	0.004
07008L Kjeldahl Nitrogen	mg N/l	10.00	17.00	14.00	13.00	19.00	23.00	12.00	16.00	10.00	3.00	3.00	0.25	11.00	15.00	3.60
07801L Total Nitrogen	mg N/l	10.03	17.04	14.04	13.04	19.04	23.03	12.03	16.04	10.03	3.02	3.12	0.57	11.04	15.05	3.63
08402L Total OC alcaline	mg/l	5.6	5.8	6.2	6.0	5.8	5.6	14.0	17.5	6.6	5.2	5.0	3.4	14.4	21.5	5.4
10401L Suspended Solids	mg/l	20	50	50	50	60	40	30	60	45	20	15	10	70	160	10
08306L TOC	mg/l															

APPENDIX 5

RESULTS OF RAIN WATER QUALITY ANALYSIS

Table APP. 5-1 Results of Rain Water Quality Analysis

Sampling date	Observation Station	PH	BOD mg/l	COD(Cr) mg/l	TN mg/l	Kj-N mg/l	TP mg/l	COD(Mn) mg/l	SS mg/l	Observation Term	Total Precipatation
08/12/92	UFF(NITEROI)	-	<2.0	<10		0.6	0.0	1.0	<2		
	UFRJ(FUNDAO)										
	PETROBRAS(CAXIAS)										
18/12/92	UFF(NITEROI)	-	<2.0	<10		<0.15	0.0	1.0	32		
	UFRJ(FUNDAO)										
	PETROBRAS(CAXIAS)										
14/01/93	UFF(NITEROI)										
	UFRJ(FUNDAO)	5.9	<2.0	<10		0.4	0.0	0.6	<2		
	PETROBRAS(CAXIAS)	4.7	<2.0	<10		0.3	0.0	0.3	<2		
05/21/93	UFF(NITEROI)										
	UFRJ(FUNDAO)	7.1		20	4.02	3.50	0.050	-	35		
	PETROBRAS(CAXIAS)										
06/01/93	UFF(NITEROI)	59.0		<10	0.62	0.40	0.024	0.4	<2		
	UFRJ(FUNDAO)										
	PETROBRAS(CAXIAS)	6.0		28	2.11	1.64	0.053	1.2	14		
06/08/93	UFF(NITEROI)	5.8		15	0.86	0.62	0.021	0.0	<2		
	UFRJ(FUNDAO)										
	PETROBRAS(CAXIAS)	5.0		22	1.29	0.95	0.027	1.0	4		
07/23/93	UFF(NITEROI)										
	UFRJ(FUNDAO)										
	PETROBRAS(CAXIAS)	6.2		57	12.08	10.53	0.372	4.8	29		
07/28/93	UFF(NITEROI)	5.8		13	2.28	1.51	0.063	2.2	2.8		
	UFRJ(FUNDAO)										
	PETROBRAS(CAXIAS)										
08/17/93	UFF(NITEROI)										
	UFRJ(FUNDAO)										
	PETROBRAS(CAXIAS)	4.5		48	8.62	6.07	0.115	4.8	29		
09/14/93	UFF(NITEROI)	8.1		77	2.42	1.60	0.276	5.4	69		
	UFRJ(FUNDAO)										
	PETROBRAS(CAXIAS)	5.3		40	2.82	2.21	0.092	3.0	17		

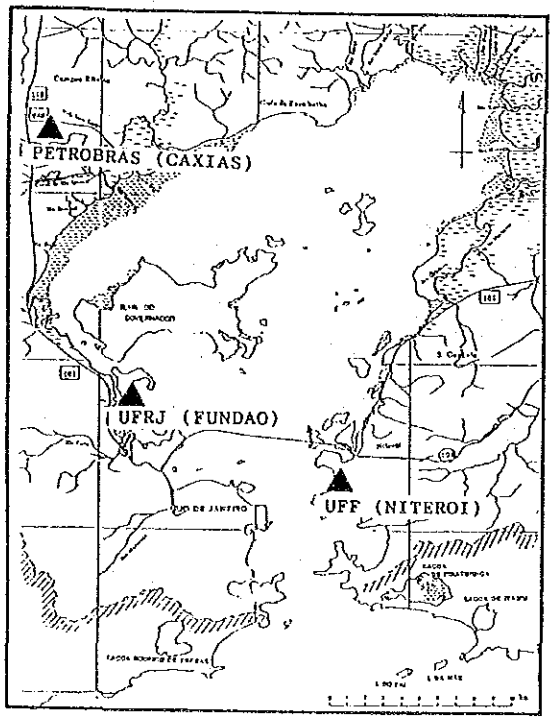

Fig. APP. 5-1 Sampling Station of Rainwater

APPENDIX 6

RESULTS OF SURVEY OF THE DRAINAGE CANALS
DISCHARGING WATER INTO JURUJUBA BAY

Table APP. 6-1 Inflowing Load into Jurujuba Bay

(MAY. 1993)

NO	Basin Area (Km2)	Discharge (m3/s)	Water Quality BOD (mg/l)	COD(Cr) (mg/l)	COD(Mn) (mg/l)	T-N (mg/l)	T-P (mg/l)	Runoff Load BOD LOAD (kg/day)	CODcrLOAD (kg/day)	CODmnLOAD (kg/day)	T-N LOAD (kg/day)	T-P LOAD (kg/day)
1 J-1		0.0027	5.20	80.00	2.20	6.70	0.35	1.21	18.66	0.51	1.56	0.08
2 J-2		0.0024	2.80	60.00	1.80	10.26	0.15	0.58	12.44	0.37	2.13	0.03
3 J-3		0.0120	180.00	640.00	2.40	39.31	3.10	186.62	663.55	2.49	40.75	3.21
4 J-4												
5 J-5		0.7050	42.00	240.00	16.10	22.75	1.55	2558.30	14618.88	980.68	1385.44	94.41
6 J-6A												
7 J-6		0.0066	600.00	2400.00	7.80	80.20	4.50	342.14	1368.58	4.45	45.73	2.57
8 J-7		0.0009	32.00	280.00	0.80	36.20	2.00	2.49	21.77	0.06	2.81	0.16
9 J-8		0.0011	120.00	640.00	3.40	45.20	2.00	11.40	60.83	0.32	4.30	0.19
10 J-8A		0.0029	5600.00	5600.00	30.00	172.20	5.70	1403.14	1403.14	7.52	43.15	1.43
11 J-9												
12 J-10		0.0021	450.00	1200.00	7.80	52.15	3.10	81.65	217.73	1.42	9.46	0.56
13 J-11		0.0003	200.00	720.00	6.60	46.10	1.45	5.18	18.66	0.17	1.19	0.04
14 J-12		0.0007	275.00	960.00	7.90	54.16	3.38	16.63	58.06	0.48	3.28	0.20
TOTAL	0.00	0.7367						4609.36	18462.30	998.47	1539.81	102.88
*(1)J-5		0.6500	40.00	-	2.20	16.38	1.15					
(2)J-5		0.7600	44.00	240.00	30.00	29.11	1.95					
*(1)J-12		0.0007	350.00	1200.00	7.20	59.10	3.45					
(2)J-12		0.0007	200.00	720.00	8.60	49.21	3.30					

(JUN. 1993)

NO	Basin Area (Km2)	Discharge (m3/s)	Water Quality BOD (mg/l)	COD(Cr) (mg/l)	COD(Mn) (mg/l)	T-N (mg/l)	T-P (mg/l)	Runoff Load BOD LOAD (kg/day)	CODcrLOAD (kg/day)	CODmnLOAD (kg/day)	T-N LOAD (kg/day)	T-P LOAD (kg/day)
1 J-1		0.0069	60.00	180.00	5.20	25.12	2.96	35.77	107.31	3.10	14.98	1.76
2 J-2		0.0046	2.00	50.00	1.60	24.82	0.14	0.79	19.87	0.64	9.86	0.06
3 J-3		0.0165	40.00	110.00	5.60	9.76	0.13	57.02	156.82	7.98	13.91	0.19
4 J-4		0.0029	20.00	40.00	4.00	14.90	1.96	5.01	10.02	1.00	3.73	0.49
5 J-5		0.8500	32.00	110.00	5.40	22.72	2.16	2350.08	8078.40	396.58	1668.56	158.63
6 J-6A		0.2270	300.00	1200.00	14.00	66.40	9.77	5883.84	23535.36	274.58	1302.29	191.62
7 J-6		0.0048	60.00	470.00	5.20	23.36	3.04	24.88	194.92	2.16	9.69	1.26
8 J-7		0.0011	90.00	230.00	10.80	34.05	4.45	8.55	21.86	1.03	3.24	0.42
9 J-8		0.0011	500.00	2600.00	7.00	84.85	7.74	47.52	247.10	0.67	8.06	0.74
10 J-8A		0.0029	2800.00	5400.00	15.60	170.69	28.66	701.57	1353.02	3.91	42.77	7.18
11 J-9												
12 J-10												
13 J-11		0.0002	300.00	630.00	6.40	52.30	6.36	5.18	10.89	0.11	0.90	0.11
14 J-12		0.0010	560.00	1100.00	12.40	74.52	11.00	48.38	95.04	1.07	6.44	0.95
TOTAL	0.00	1.1190						9168.61	33830.61	692.82	3084.43	363.40

Table APP. 6-2 Results of Water Quality Analysis of Inflowing Load Survey into Jurujuba Bay

Date of sampling MAY. 20(1993)

General number of the laboratory			7513	7514	7515	7516	7525	7517	7518	7529	7524	7520	7521	7522	7523
Station			J-1	J-2	J-3	J-5	J-5	J-6	J-7	J-8	J-8A	J-10	J-11	J-12(1)	J-12(2)
CODE	PARAMETER	UNITY													
	Time	H	8.45	8.55	9.10	9.30	15.45	9.45	10.05	10.10	15.20	10.20	10.30	10.35	14.45
02062F	Air temperature	C	19.50	19.50	19.50	21.00	20.00	21.00	21.00	21.00	20.00	23.00	23.00	23.00	23.00
02061F	Water temperature	C	22.00	22.00	22.00	22.00	22.00	22.00	21.00	25.00	24.00	22.00	22.00	23.50	23.00
08202L	BOD (total)	mg/l	5.2	2.8	180	40	44	600	32	120	5600	450	200	350	200
08301L	COD (total)	mg/l	80	60	540	-	240	2400	280	540	5600	1200	720	1200	720
15408L	Total Phosphorus	mg P/l	0.35	0.15	3.10	1.15	1.95	4.50	2.00	2.00	5.70	3.10	1.45	3.45	3.30
07306L	Nitrate Nitrogen	mg N/l	4.35	10.00	0.30	0.35	0.10	0.20	0.20	0.20	0.20	0.15	0.10	0.10	0.20
07309L	Nitrite Nitrogen	mg N/l	0.150	0.060	0.007	0.030	0.009	0.001	0.002	0.001	0.004	0.002	0.001	0.001	0.010
07008L	Kjeldahl Nitrogen	mg N/l	2.20	0.20	39.00	15.00	29.00	80.00	36.00	45.00	172.00	52.00	46.00	59.00	49.00
07801L	Total Nitrogen	mg N/l	6.70	10.26	39.31	15.38	29.11	80.20	36.20	45.20	172.20	52.15	46.10	59.10	49.21
08402L	Total OC alcaline	mg/l	2.2	1.8	2.4	2.2	30.0	7.8	0.8	3.4	30.0	7.8	6.6	7.2	8.6
10401L	Suspended Solids	mg/l	2	3	170	50	50	1300	9	180	1300	330	180	160	160
08306L	TOC	mg/l	37	16	130	45	56	560	50	202	940	152	185	121	207
	Dischage	l/s	2.7	2.4	12.0	650.0	760.0	6.6	0.9	1.1	2.9	2.1	0.3	0.7	0.7

Date of sampling JUNE. 7(1993)

General number of the laboratory			9306.00	8307	9308	9309	8310	8311	8312	8313	8314	8315	8316	8317
Station			J-1	J-2	J-3	J-4	J-5	J-6A	J-6	J-7	J-8	J-8A	J-11	J-12
CODE	PARAMETER	UNITY												
	Time	H	9.20	9.25	9.30	9.35	9.45	10.45	10.35	10.40	10.45	10.50	11.05	11.15
02052F	Air temperature	C	21.00	22.00	22.00	22.00	24.00	24.00	24.50	24.00	24.50	25.00	26.00	26.00
02061F	Water temperature	C	22.50	22.00	21.00	21.00	21.50	21.50	21.50	24.00	24.00	22.00	23.00	22.00
08202L	BOD (total)	mg/l	60	2	40	20	32	300	60	90	500	2800	300	560
08301L	COD (total)	mg/l	180	50	110	40	110	1200	470	230	2600	5400	630	1100
15408L	Total Phosphorus	mg P/l	2.96	0.14	0.13	1.96	2.16	9.77	3.04	4.45	7.74	28.66	6.36	11.00
07306L	Nitrate Nitrogen	mg N/l	1.21	23.69	1.14	0.50	0.48	0.58	0.67	0.71	0.53	0.82	0.34	1.19
07309L	Nitrite Nitrogen	mg N/l	*	*	*	*	*	*	*	*	*	*	*	*
07008L	Kjeldahl Nitrogen	mg N/l	23.91	1.12	8.63	14.40	22.24	65.83	22.68	33.34	84.32	169.88	51.96	73.33
07801L	Total Nitrogen	mg N/l	25.12	24.82	9.78	14.90	22.72	66.40	23.36	34.05	84.85	170.69	52.30	74.52
08402L	Total OC alcaline	mg/l	5.2	1.6	5.6	4.0	5.4	14.0	5.2	10.8	7.0	15.6	6.4	12.4
10401L	Suspended Solids	mg/l	67	6	87	11	83	377	53	44	272	1232	11	250
08306L	TOC	mg/l												
	Dischage	l/s	6.9	4.6	16.5	2.9	850	227	4.8	1.1	1.1	2.9	0.2	1.0

APPENDIX 7

PRECIPITATION DATA AT DUQUE DE CAXIAS (1989-1993)

Table APP. 7-1 Monthly Precipitation at Duque de Caxias (1988-1993)

Unit:mm

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977													
1978													
1979													
1980													
1981													
1982													
1983													
1984													
1985													
1986													
1987													
1988				161.6	56.9		48.3		59.8	177.2			
1989				46.0	54.0	164.9	26.0						
1990			147.5	6.3	20.6		92.1	79.1	169.6	123.3	125.4	167.9	
1991	352.8	341.1	390.6	143.1	185.6	89.8	17.7	0.0	292.0	193.3	33.7	280.5	2,320.2
1992	284.4	130.6	82.9	125.7	53.6	1.5	44.5	9.0	106.6	206.8	368.9	114.2	1,528.7
1993	226.4	371.4	66.6	43.0	185.1	129.7							

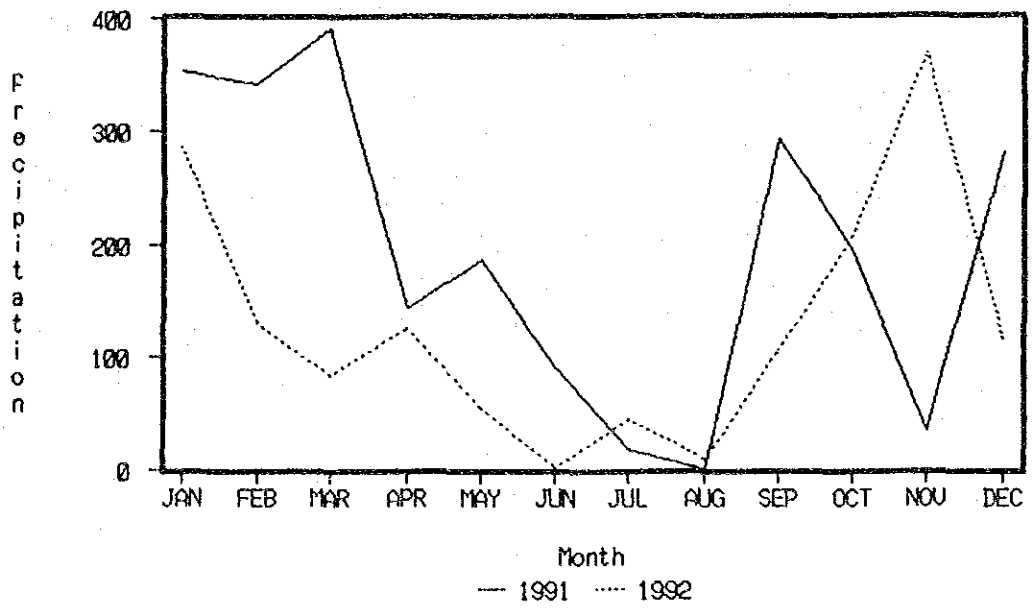

Fig. APP. 7-1 Monthly Change of Precipitation at Duque de Caxias (1991 and 1992)

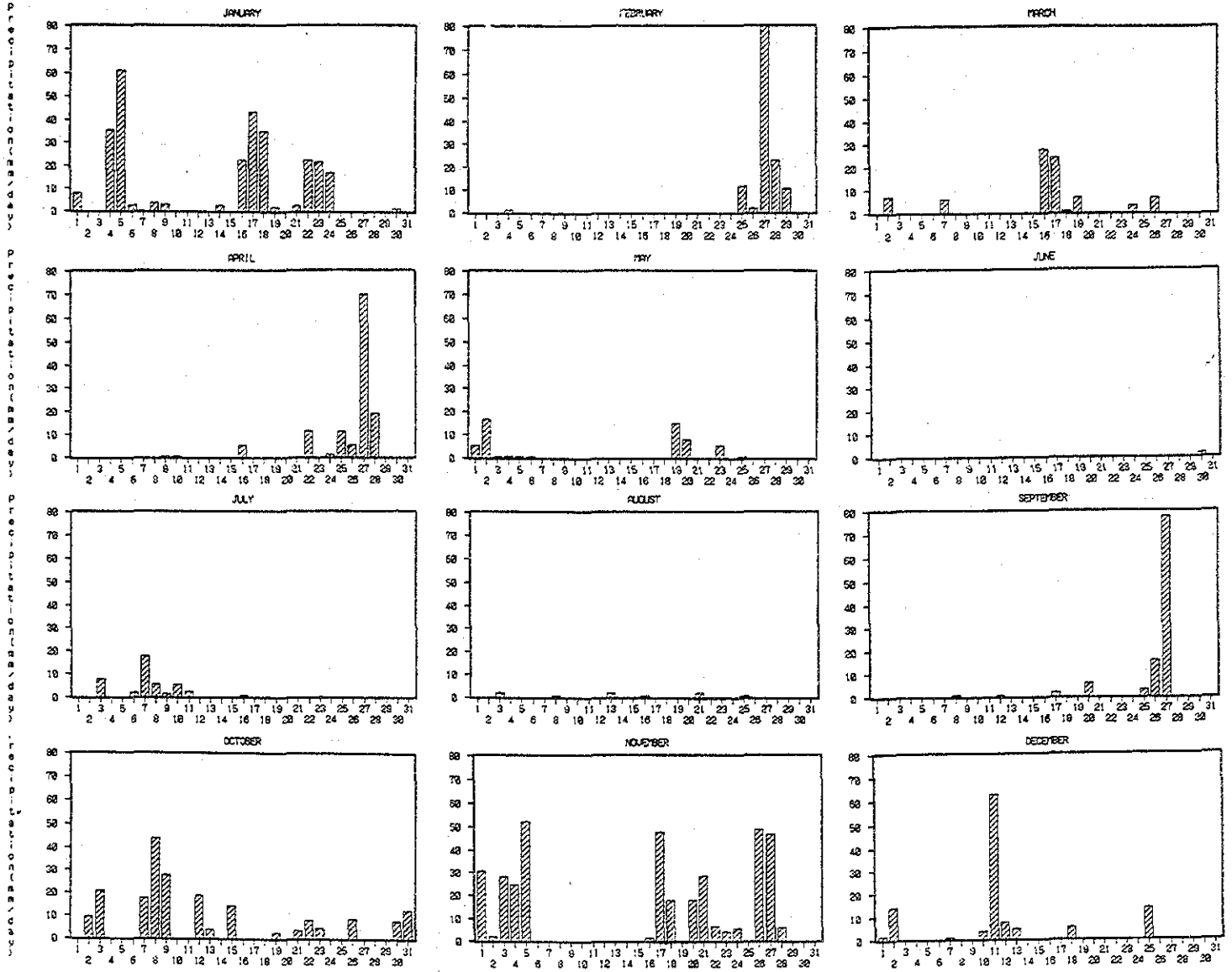

Fig. APP. 7-2 Daily Precipitation at Duque de Caxias (1992)

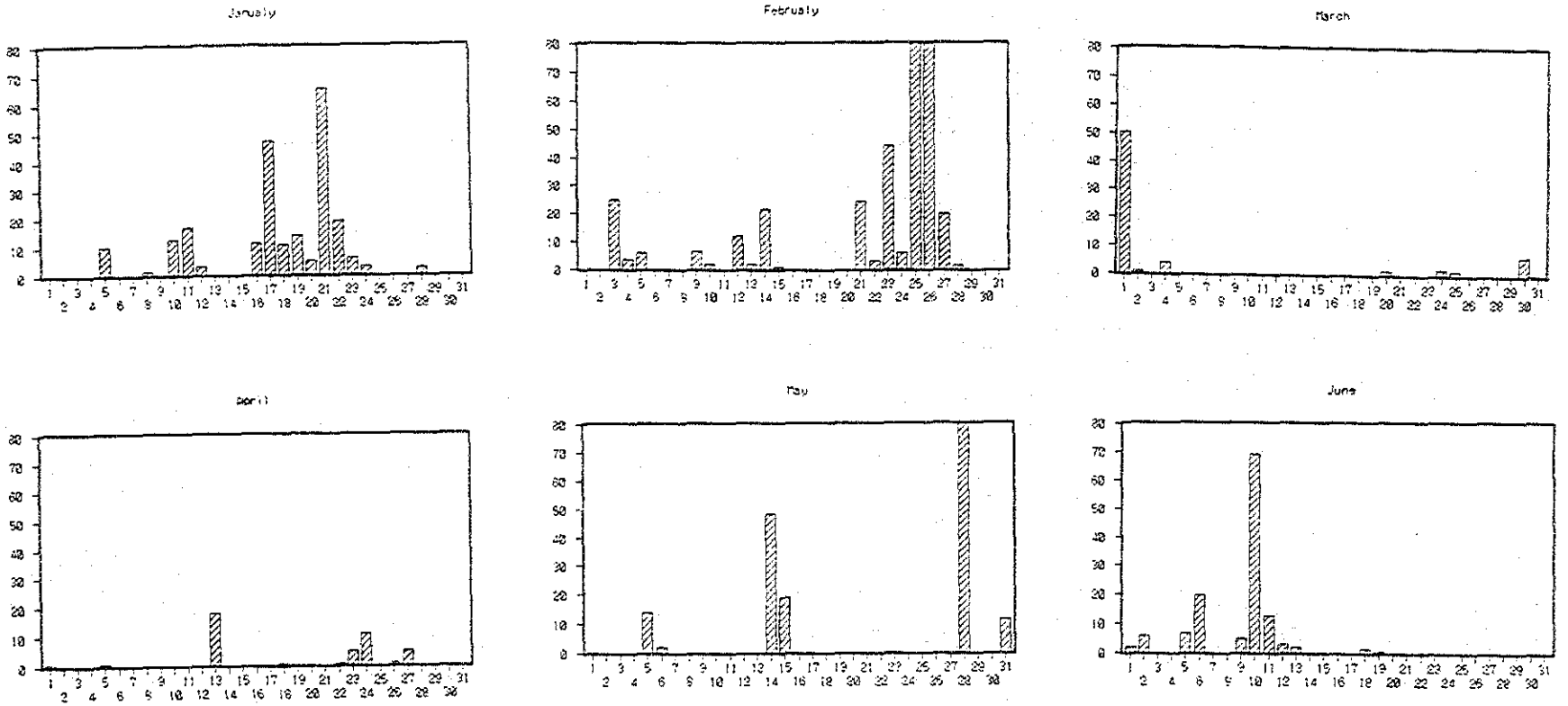

Fig. APP. 7-2 Daily Precipitation at Duque de Caxias (1993)

Table APP. 7-2 Daily Precipitation at Duque de Caxias (1988-1993)

St.Name : Duque de Caxias (1988) unit:mm/day

Date	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				7.0	0.0		1.2		0.0	0.0		
2				11.0	0.0		0		0.0	0.0		
3				0.8	0.0		0.0		5.1	0.0		
4				0.0	0.0		0.0		6.0	2.4		
5				6.0	3.4		0.0		0.0	0.4		
6				0.0	3.5		0.0		0.0	12.3		
7				0.0	0.0		0.2		0.0	0.0		
8				3.7	0.0		5.8		0.0	0.0		
9				7.0	0.0		2.7		0.0	0.0		
10				0.0	0.0		1.7		0.0	0.3		
11				0.0	0.0		2.5		0.0	0.4		
12				0.0	0.0		8.0		0.0	34.5		
13				16.5	0.0		17.4		0.0	0.1		
14				0.0	8.4		1.4		3.2	0.0		
15				0.0	0.0		0.0		6.9	0.0		
16				0.0	0.0		0.0		5.3	0.0		
17				2.3	0.7		0.0		4.3	50.1		
18				0.0	0.0		0.0		13.3	0.0		
19				0.0	0.0		0.0		0.2	4.0		
20				0.1	0.0		0.0		0.0	4.4		
21				0.0	0.0		0.0		0.0	1.9		
22				0.1	3.0		0.0		0.0	0.0		
23				3.9	0.0		0.0		0.0	13.3		
24				0.3	10.4		1.4		0.0	0.0		
25				0.0	1.7		2.0		0.0	10.0		
26				0.0	7.4		2.9		0.0	14.8		
27				0.0	0.0		1.1		0.2	26.3		
28				80.5	0.0		0.0		8.1	2.0		
29				12.7	0.0		0.0		5.4	0.0		
30				9.7	18.4		0.0		1.8	0.0		
31					0.0		0.0			0.0		
Total	0.0	0.0	0.0	161.6	56.9	0.0	48.3	0.0	59.8	177.2	0.0	0.0

Daily Precipitation

St.Name : Duque de Caxias (1989) unit:mm/day

Date	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1					0.0	0.0						
2					0.0	0.0						
3					0.0	0.0						
4					0.0	0.0						
5					6.6	0.0						
6					3.7	0.0						
7					27.1	0.0						
8					0.0	0.0						
9					0.0	0.0						
10				0.0	0.0	6.7						
11				5.1	0.0	145.5						
12				2.8	3.3	12.7	0.0					
13				10.0	0.0	0.0	0.0					
14				1.0	0.0	0.0	0.0					
15				1.1	0.0	0.0	0.0					
16				0.8	0.0	0.0	0.0					
17				0.0	3.3	0.0						
18				0.0	0.0	0.0						
19				16.7	0.0	0.0	0.0					
20				7.5	0.0	0.0	0.0					
21				0.0	0.0	0.0	0.0					
22				0.0	0.0	0.0	0.0					
23				0.0	0.0	0.0	0.0					
24				0.0	0.0		0.0					
25				1.0	3.8		0.0					
26				0.0	6.2		0.0					
27				0.0	0.0		5.5					
28				0.0	0.0		13.4					
29				0.0	0.0		0.0					
30				0.0	0.0		7.1					
31					0.0		0.0					
Total	0.0	0.0	0.0	46.0	54.0	164.9	26.0	0.0	0.0	0.0	0.0	0.0

Table APP. 7-2 Daily Precipitation at Duque de Caxias (1988-1993)

St.Name : Duque de Caxias (1989) unit:mm/day

Date	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1					0.0	0.0						
2					0.0	0.0						
3					0.0	0.0						
4					0.0	0.0						
5					6.6	0.0						
6					3.7	0.0						
7					27.1	0.0						
8					0.0	0.0						
9					0.0	0.0						
10				0.0	0.0	6.7						
11				5.1	0.0	145.5						
12				2.8	3.3	12.7	0.0					
13				10.0	0.0	0.0	0.0					
14				1.0	0.0	0.0	0.0					
15				1.1	0.0	0.0	0.0					
16				0.8	0.0	0.0	0.0					
17				0.0	3.3	0.0						
18				0.0	0.0	0.0						
19				16.7	0.0	0.0	0.0					
20				7.5	0.0	0.0	0.0					
21				0.0	0.0	0.0	0.0					
22				0.0	0.0	0.0	0.0					
23				0.0	0.0	0.0	0.0					
24				0.0	0.0		0.0					
25				1.0	3.8		0.0					
26				0.0	6.2		0.0					
27				0.0	0.0		5.5					
28				0.0	0.0		13.4					
29				0.0	0.0		0.0					
30				0.0	0.0		7.1					
31					0.0		0.0					
Total	0.0	0.0	0.0	46.0	54.0	164.9	26.0	0.0	0.0	0.0	0.0	0.0

Daily Precipitation

St.Name : Duque de Caxias (1990) unit:mm/day

Date	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			0.0	0.0	0.0			0.0	1.7	0.0	0.0	0.0
2			0.0	0.8	0.0			0.0	0.3	11.1	0.0	0.0
3			0.0	0.1	0.0		0.0	0.0	0.0	0.0	0.0	0.0
4			0.0	0.6	0.9		0.0	1.1	2.2	1.6	4.0	0.0
5			0.0	0.5	0.0		10.3	0.0	4.5	0.0	9.4	0.0
6			0.0	0.0	0.0		0.0	2.7	0.0	0.0	11.2	0.0
7			0.0	1.1	0.0		0.0	0.0	0.0	0.0	0.0	0.0
8			4.3		0.0		0.0	0.0	0.0	0.0	0.0	53.2
9			0.0	0.7	0.0		0.0	0.0	0.0	0.0	0.0	0.0
10			0.0	0.3	0.0		5.5	0.0	0.0	0.0	0.0	0.0
11			0.0	0.0	2.6		40.2	0.0	0.2	0.0	0.0	0.0
12			0.0	1.5	11.8		24.4	0.0	65.8	13.2	0.0	14.0
13			0.0		0.0		0.0	0.0	1.1	1.2	0.0	0.0
14			0.0	0.7	0.0		0.0	0.0	0.0	0.0	0.0	22.0
15			0.0	0.0	0.0		0.0	0.0	0.0	3.4	0.0	5.4
16			0.0	0.0	1.9		0.1	0.0	0.0	12.7	0.0	2.6
17			0.0		0.2		0.0	5.5	0.0	3.7	0.0	23.9
18					2.3		0.0	17.7	0.0	0.0	3.5	0.0
19			40.0		0.0		2.1	0.0	0.5	7.9	0.0	0.0
20			17.5		0.0		0.0	13.2	0.0	6.7	0.0	0.0
21			20.0		0.0		0.0	0.4	12.1	0.0	0.0	0.0
22			3.0		0.6		0.0	9.6	56.9	0.6	0.0	0.0
23			10.1		0.0		0.0	17.4	2.3	0.0	41.3	0.0
24			13.9		0.0		0.0	0.4	17.1	25.5	49.3	1.0
25			29.8		0.0		2.1	0.0	3.7	34.8	0.0	31.2
26			5.3		0.0		0.0	0.0	0.2	0.9	0.0	0.0
27			0.0		0.0		0.2	0.0	0.0	0.0	6.7	3.0
28			0.0		0.1		6.4	2.3	0.0	0.0	0.0	0.0
29			3.6		0.2		0.0	8.8	0.0	0.0	0.0	11.5
30			0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.1
31			0.0		0.0		0.8	0.0	1.0	0.0		
Total	0.0	0.0	147.5	6.3	20.6	0.0	92.1	79.1	169.6	123.3	125.4	167.9

Table APP. 7-2 Daily Precipitation at Duque de Caxias (1988-1993)

St.Name : Duque de Caxias (1991) unit:mm/day

Date	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	8.6	0.3	5.5	0.0	0.0	0.0	0.0		24.0	50.1		3.1
2	0.0	0.4	8.5	10.3	0.0		0.0		10.3	56.5		3.4
3	35.0	5.5	0.8	0.0	0.0	0.0	0.0		0.0	12.8		0.0
4	0.0	0.0	36.0	0.0	0.0		2.4		0.0	0.0		0.0
5	0.3		5.4	21.1	0.0		0.0		0.0	0.0		0.0
6	0.0	3.0	1.2	0.2	96.0		0.0		0.0	25.5		0.0
7	3.5	78.0	1.1	0.0	45.0		0.0		0.0	30.3		0.0
8	0.0	13.9	1.8	0.0	4.2		0.0		0.0	4.2		16.1
9	0.0		1.0	4.0			0.0		0.0	2.0		0.0
10	46.6			0.0		0.2	0.0		0.0	0.7		0.3
11	29.5			0.0		0.0	0.0		0.0	0.0		0.0
12	0.0			0.0		0.0	0.0		0.0	1.4		13.9
13	5.5			0.0	0.0	0.0	0.8	0.0	0.0	0.0		9.0
14	6.5	0.4	10.2	0.0	0.0	0.0	12.9	0.0	0.0	0.0		0.0
15	11.9	10.7	0.0	1.4	0.0	0.2	0.0	0.0	0.0	0.0		0.0
16	79.0	152.3	0.0	0.0	30.6	0.0	0.0	0.0	27.7	0.0		8.0
17	18.1	1.2	0.0	0.0	0.0	0.2	1.5	0.0	0.0	0.0		18.4
18	0.0	56.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		7.6
19	0.0	1.5	0.0	8.3	0.0	0.0	0.0	0.0	31.8	0.9		33.8
20	1.0	0.0	0.0	33.4	6.8	0.0	0.0	0.0	16.7	8.9		17.7
21	0.0	0.0	22.4	0.0	3.0	0.0	0.0	0.0	0.0	0.0		2.0
22	1.9	0.3	27.0	0.0		0.0	0.1	0.0	0.0	0.0		0.2
23	6.4	6.4	17.3	0.0		0.0		0.0	0.0	0.0		0.0
24	9.3	6.8	17.2	0.0		10.6		0.0	7.9	0.0		0.0
25	23.5	1.1	77.5	2.3		0.0		0.0	50.4			4.3
26	1.1	1.2	38.7	51.3		0.0		0.0	11.4			0.8
27	43.1	0.8	48.5	4.8		0.0		0.0	2.1			129.4
28	6.6	0.9	4.6	0.0		0.0		0.0	43.2		0.0	10.0
29	15.2		62.6	1.9		39.6		0.0	62.0		0.0	2.5
30	0.2		1.3	4.1	0.0	39.0		0.0	4.5		33.7	0.0
31	0.0		2.0		0.0			0.0				0.0
Total	352.8	341.1	390.6	143.1	185.6	89.8	17.7	0.0	292.0	193.3	33.7	280.5

Daily Precipitation

St.Name : Duque de Caxias (1992) unit:mm/day

Date	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	8.1	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0	30.6	1.4
2	0.0	0.0	7.1	0.0	16.7	0.0	0.0	0.0	0.0	9.8	2.0	14.2
3	0.0	0.0	0.0	0.0	0.7	0.0	7.6	2.0	0.0	21.1	28.3	0.0
4	35.5	1.3	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	24.8	0.0
5	61.2	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	52.3	0.0
6	2.7	0.0	0.0	0.0	0.6	0.0	2.2	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	6.0	0.0	0.0	0.0	17.8	0.0	0.0	17.7	0.0	1.0
8	3.5	0.0	0.0	0.0	0.0	0.0	5.6	1.0	1.0	43.9	0.0	0.0
9	2.9	0.0	0.0	0.7	0.0	0.0	1.4	0.0	0.0	27.9	0.0	0.0
10	0.0	0.0	0.0	0.6	0.0	0.0	5.2	0.0	0.0	0.0	0.0	3.4
11	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	62.6
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	19.0	0.0	7.6
13	0.0	0.0	0.0	0.3	0.0	0.0	0.0	2.0	0.0	4.0	0.0	4.6
14	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	0.0	0.0
16	22.7	0.0	27.7	5.4	0.0	0.0	0.8	1.0	0.0	0.0	1.4	0.0
17	43.4	0.0	24.2	0.0	0.0	0.0	0.4	0.0	2.0	0.0	47.6	0.0
18	34.7	0.0	1.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	18.0	5.4
19	1.9	0.0	6.8	0.0	15.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0
20	0.0	0.0	0.0	0.0	7.9	0.0	0.0	0.0	6.0	0	18.1	0.0
21	2.6	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	3.7	28.5	0.0
22	22.7	0.0	0.0	11.6	0.1	0.0	0.0	0.0	0.0	8.2	6.5	0.0
23	21.7	0.0	0.0	0.0	5.3	0.0	0.2	0.0	0.0	4.6	4.0	0.0
24	17.1	0.0	3.2	1.3	0.0	0.0	0.2	0.0	0.0	0.0	5.5	0.0
25	0.0	11.9	0.2	11.3	0.5	0.1	0.3	1.0	3.1	0.0	0.0	14.0
26	0.0	2.1	6.7	5.4	0.0	0.0	0.2	0.0	16.0	9.0	48.7	0.0
27	0.0	81.6	0.0	69.8	0.1	0.0	0.0	0.0	77.5	0.0	46.6	0.0
28	0.0	23.1	0.0	19.3	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0
29	0.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	1.1	-	0.0	0.0	0.0	1.4	0.0	0.0	0.0	8.0	0.0	0.0
31	0.0	-	0.0	-	0.0	-	0.0	-	0.0	12.7	-	0.0
Total	284.4	130.6	82.9	125.7	53.6	1.5	44.5	9.0	106.6	206.8	368.9	114.2

Table APP. 7-2 Daily Precipitation at Duque de Caxias (1988-1993)

St.Name : Duque de Caxias (1993) unit:mm/day

Date	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	0.0	50.2	0.6	0.0	2.0						
2	0.0	0.0	1.0	0.0	0.0	5.9						
3	0.0	24.9	0.0	0.0	0.0	0.0						
4	0.0	3.6	3.8	0.0	0.0	0.0						
5	10.1	6.0		0.6	14.0	6.8						
6	0.0	0.0		0.0	2.0	19.7						
7	0.0	0.0		0.0	0.0	0.0						
8	1.2	0.0		0.0	0.0	0.0						
9	0.0	6.4		0.0	0.0	5.0						
10	12.3	1.7		0.0	0.0	69.2						
11	16.9	0.0		0.0	0.0	12.8						
12	3.0	12.0		0.0	0.0	2.9						
13	0.0	1.9		18.0	0.0	2.2						
14	0.0	21.6		0.0	48.0	0.4						
15	0.0	1.0		0.0	19.0	0.2						
16	11.3	0.0		0.0	0.0	0.0						
17	46.8	0.0	0.0	0.2	0.0	0.0						
18	10.5	0.0	0.0	0.6	0.0	1.4						
19	14.0	0.0	0.0	0.0	0.1	0.7						
20	4.9	0.0	1.4	0.2	0.0	0.0						
21	65.0	24.3	0.0	0.1	0.0	0.0						
22	18.9	3.0	0.0	0.5	0.0	0.3						
23	6.0	44.0	0.0	5.1	0.4	0.1						
24	3.0	6.0	2.0	10.8	0.0	0.0						
25	0.0	82.9	1.4	0.2	0.0	0.0						
26	0.0	110.7	0.0	1.0	0.0	0.0						
27	0.0	19.9	0.0	5.1	0.0	0.1						
28	2.5	1.5	0.0	0.0	90.0	0.0						
29	0.0		0.0	0.0	0.0	0.0						
30	0.0		6.6	0.0	0.0	0.0						
31	0.0		0.2		11.6							
Total	226.4	371.4	66.6	43.0	185.1	129.7	0.0	0.0	0.0	0.0	0.0	0.0

APPENDIX 8

RESULTS OF RIVER WATER ANALYSIS BY FEEMA (1980-1991)

Table APP. 8-1 Annual Change of River Water Quality

(BOD) (1980-1993)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population (persons)	Population Density (p/km2)	Land use Type	80 - 86 (27~44)	87 - 89 (4~11)	90 - 91 (4~ 7)	92 - 93 (9)
1 CI780	CANAL CANTO DO RIO	7.40	2	7.40	41,745	5.64	Urb/S.T	32.0	20.0	24.6	26.0
2 BM760	RIO BOMBA	3.40	5	26.20	183,099	6.99	Urban	170.0	105.0	93.8	74.8
3 IB810	RIO IMBOASSU	11.60	6	30.80	138,636	4.50	Urban				8.8
4 AN740	RIO ALCANTARA	58.50	8	144.60	470,420	3.25	Urban	760.0	50.0	149.0	613.8
5 MT820	RIO MUTONDO	5.50	8			3.25	Urban				58.3
6 GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	6.0	10.0	11.0	11.6
7 CC622	RIO CACEREBU	758.40	9	846.70	336,193	0.40	N/A	5.4	7.2	8.2	8.9
8 GP600	RIO GUAPIMIRIM	1283.70	10	1253.10	69,853	0.06	N/A	2.4	3.2	2.3	2.8
*9 MC967	RIO MACACU	256.00	10-3	256.00	18,577	0.07	N/A	2.0	2.0	2.0	1.8
*10 SB998	RIO SOBERBO	45.20	10-6	132.40	17,911	0.14	N/A	8.6	36.0	44.0	55.2
11 MG580	CANAL DE MAGE	4.60	11	18.30	8,458	0.46	N/A	8.0	6.0	34.5	28.0
12 RN560	RIO RONCADOR	107.00	12	111.40	36,370	0.33	N/A	4.0	3.2	2.6	2.3
13 IR540	RIO IRIRI	8.40	13	27.80	10,684	0.38	N/A				6.2
14 SR500	RIO SURUI	53.20	14	68.80	12,910	0.19	N/A				3.5
15 ES400	RIO ESTRELA	342.50	16	342.50	302,495	0.88	N/A	9.0	10.0	8.9	15.1
*16 IN460	RIO INHOMIRIM	139.00	16-2	139.00	84,106	0.61	N/A	4.0	2.4	3.9	2.6
*17 SC420	RIO SARACURUNA	186.00	16-3	186.00	194,173	1.04	N/A	4.0	4.0	6.8	9.7
18 IA260	RIO IGUACU	544.20	17-1~5	562.80	758,010	1.35	N/A	10.0	10.0	15.0	9.2
19 SP300	RIO SARAPUI	159.80	17-6	165.50	1,012,275	6.12	Urban	26.0	24.0	36.0	25.9
20 SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1,492,458	9.07	Urban	38.0	40.0	35.0	24.7
*21 AC241	RIO ACARI	57.90	19-2	57.90	438,076	7.57	Urban				35.7
22 IJ200	RIO IRAJA	27.30	20	35.70	500,276	14.01	Urban	34.0	20.0	42.0	50.0
23 PN180	CANAL DO PENHA	-	20	-				50.0	34.0	35.0	49.4
24 CN100	CANAL DO CUNHA	60.50	21	63.60	815,389	12.82	Urban	60.0	30.0	68.0	50.1
25 MN000	CANAL DO MANGUE	42.80	23	42.80	500,876	11.70	Urb/S.T	80.0	48.0	56.0	44.4
TOTAL		3604.10		3912.50	6,690,147						

*( ) : Number of Data

Table APP. 8-1 Annual Change of River Water Quality

(COD(Cr)) (1980-1993)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population (persons)	Population Density (p/km2)	Land use Type	80 - 86	87 - 89	90 - 91 (3 ~ 6)	92 - 93 (9)
1 CI780	CANAL CANTO DO RIO	7.40	2	7.40	41.745	5.64	Urb/S.T			76.0	74.3
2 BM760	RIO BOMBA	3.40	5	26.20	183.099	6.99	Urban			188.3	191.0
3 IB810	RIO IMBOASSU	11.60	6	30.80	138.636	4.50	Urban				1440.0
4 AN740	RIO ALCANTARA	58.50	8	144.60	470.420	3.25	Urban			460.0	337.8
5 MT820	RIO MUTONDO	5.50	8			3.25	Urban				125.9
6 GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban			37.5	44.0
7 CC622	RIO CACEREBU	758.40	9	846.70	336.193	0.40	N/A			34.2	35.2
8 GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69.853	0.06	N/A			13.3	20.4
*9 MC967	RIO MACACU	256.00	10-3	256.00	18.577	0.07	N/A			10.8	10.0
*10 SB998	RIO SOBERBO	45.20	10-6	132.40	17.911	0.14	N/A			140.0	114.4
11 MG580	CANAL DE MAGE	4.60	11	18.30	8.458	0.46	N/A			145.0	83.2
12 RN560	RIO RONCADOR	107.00	12	111.40	36.370	0.33	N/A			11.7	14.5
13 IR540	RIO IRIRI	8.40	13	27.80	10.684	0.38	N/A				45.5
14 SR500	RIO SURUI	53.20	14	68.80	12.910	0.19	N/A				23.2
15 ES400	RIO ESTRELA	342.50	16	342.50	302.495	0.88	N/A			26.7	33.6
*16 IN460	RIO INHOMIRIM	139.00	16-2	139.00	84.106	0.61	N/A			13.3	15.2
*17 SC420	RIO SARACURUNA	186.00	16-3	186.00	194.173	1.04	N/A			36.7	24.1
18 IA260	RIO IGUACU	544.20	17-1~5	562.80	758.010	1.35	N/A			75.0	37.1
19 SP300	RIO SARAPUI	159.80	17-6	165.50	1.012.275	6.12	Urban			98.0	68.7
20 SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1.492.458	9.07	Urban			135.0	144.8
*21 AC241	RIO ACARI	57.90	19-2	57.90	438.076	7.57	Urban				71.9
22 IJ200	RIO IRAJA	27.30	20	35.70	500.276	14.01	Urban			160.0	104.9
23 PN180	CANAL DO PENHA	-	20	-						180.0	121.6
24 CN100	CANAL DO CUNHA	60.50	21	63.60	815.389	12.82	Urban			160.0	98.7
25 MN000	CANAL DO MANGUE	42.80	23	42.80	500.876	11.70	Urb/S.T			130.0	115.7
TOTAL		3604.10		3912.50	6.690.147						

*( ) : Number of Data

Table APP. 8-1 Annual Change of River Water Quality

(K-N) (1980-1993)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population (persons)	Population Density (p/km2)	Land use Type	80 - 86	87 - 89 (2 ~ 9)	90 - 91 (4 ~ 7)	92 - 93 (9)
1 CI780	CANAL CANTO DO RIO	7.40	2	7.40	41,745	5.64	Urb/S.T		21.00	17.90	14.00
2 BM760	RIO BOMBA	3.40	5	26.20	183,099	6.99	Urban		34.00	28.25	23.22
3 IB810	RIO IMBOASSU	11.60	6	30.80	138,636	4.50	Urban				3.49
4 AN740	RIO ALCANTARA	58.50	8	144.60	470,420	3.25	Urban		30.00	20.50	26.17
5 MT820	RIO MUTONDO	5.50	8			3.25	Urban				19.56
6 GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban		3.00	11.20	8.30
7 CC622	RIO CACEREBU	758.40	9	846.70	336,193	0.40	N/A		1.00	1.97	1.31
8 GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69,853	0.06	N/A		0.50	0.80	0.65
*9 MC967	RIO MACACU	256.00	10-3	256.00	18,577	0.07	N/A		0.80	1.29	0.46
*10 SB998	RIO SOBERBO	45.20	10-6	132.40	17,911	0.14	N/A		1.40	1.75	0.96
11 MG580	CANAL DE MAGE	4.60	11	18.30	8,458	0.46	N/A		2.60	15.88	10.00
12 RN560	RIO RONCADOR	107.00	12	111.40	36,370	0.33	N/A		0.80	0.76	0.50
13 IR540	RIO IRIRI	8.40	13	27.80	10,684	0.38	N/A				1.34
14 SR500	RIO SURUI	53.20	14	68.80	12,910	0.19	N/A				0.66
15 ES400	RIO ESTRELA	342.50	16	342.50	302,495	0.88	N/A		3.00	3.50	2.23
*16 IN460	RIO INHOMIRIM	139.00	16-2	139.00	84,106	0.61	N/A		0.80	1.20	1.41
*17 SC420	RIO SARACURUNA	186.00	16-3	186.00	194,173	1.04	N/A		2.40	1.38	1.89
18 IA260	RIO IGUACU	544.20	17-1~5	562.80	758,010	1.35	N/A		6.50	8.40	4.16
19 SP300	RIO SARAPUI	159.80	17-6	165.50	1,012,275	6.12	Urban		15.00	16.60	13.98
20 SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1,492,458	9.07	Urban		16.00	15.25	12.17
*21 AC241	RIO ACARI	57.90	19-2	57.90	438,076	7.57	Urban				10.64
22 IJ200	RIO IRAJA	27.30	20	35.70	500,276	14.01	Urban		17.00	14.60	13.67
23 PN180	CANAL DO PENHA	-	20	-					18.00	26.50	14.33
24 CN100	CANAL DO CUNHA	60.50	21	63.60	815,389	12.82	Urban		23.00	13.80	12.67
25 MN000	CANAL DO MANGUE	42.80	23	42.80	500,876	11.70	Urb/S.T		19.00	17.40	12.44
TOTAL		3604.10		3912.50	6,690,147						

*( ) : Number of Data

Table APP. 8-1 Annual Change of River Water Quality

(NH4-N) (1980-1993)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population (persons)	Population Density (p/km2)	Land use Type	80 - 86 (26~43)	87 - 89 (4 ~ 11)	90 - 91 (4 ~ 7)	92 - 93 (9)
1	CI780	CANAL CANTO DO RIO	7.40	2	7.40	41.745	5.64	Urb/S.T	15.00	13.00	11.90	7.13
2	BM760	RIO BOMBA	3.40	5	26.20	183.099	6.99	Urban	23.00	19.00	17.40	9.40
3	IB810	RIO IMBOASSU	11.60	6	30.80	138.636	4.50	Urban				1.49
4	AN740	RIO ALCANTARA	58.50	8	144.60	470.420	3.25	Urban	4.20	3.00	7.17	5.13
5	MT820	RIO MUTONDO	5.50	8			3.25	Urban				8.61
6	GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	1.40	1.30	8.08	4.94
7	CC622	RIO CACEREBU	758.40	9	846.70	336.193	0.40	N/A	0.45	0.40	0.55	0.32
8	GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69.853	0.06	N/A	0.07	0.08	0.07	0.06
*9	MC967	RIO MACACU	256.00	10-3	256.00	18.577	0.07	N/A	0.60	0.04	0.56	0.07
*10	SB998	RIO SOBERBO	45.20	10-6	132.40	17.911	0.14	N/A	0.30	0.04	0.22	0.11
11	MG580	CANAL DE MAGE	4.60	11	18.30	8.458	0.46	N/A	1.00	1.60	9.60	12.60
12	RN560	RIO RONCADOR	107.00	12	111.40	36.370	0.33	N/A	0.25	0.20	0.19	0.09
13	IR540	RIO IRIRI	8.40	13	27.80	10.684	0.38	N/A				0.69
14	SR500	RIO SURUI	53.20	14	68.80	12.910	0.19	N/A				0.16
15	ES400	RIO ESTRELA	342.50	16	342.50	302.495	0.88	N/A	1.10	1.20	2.03	1.28
*16	IN460	RIO INHOMIRIM	139.00	16-2	139.00	84.106	0.61	N/A	0.10	0.20	0.28	0.31
*17	SC420	RIO SARACURUNA	186.00	16-3	186.00	194.173	1.04	N/A	0.35	0.50	0.51	0.69
18	IA260	RIO IGUACU	544.20	17-1~5	562.80	758.010	1.35	N/A	3.00	3.00	5.82	2.76
19	SP300	RIO SARAPUI	159.80	17-6	165.50	1.012.275	6.12	Urban	11.00	8.00	13.60	4.81
20	SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1.492.458	9.07	Urban	10.00	9.00	12.25	5.36
*21	AC241	RIO ACARI	57.90	19-2	57.90	438.076	7.57	Urban				5.54
22	IJ200	RIO IRAJA	27.30	20	35.70	500.276	14.01	Urban	9.00	8.00	9.60	5.78
23	PN180	CANAL DO PENHA	-	20	-				8.00	8.00	17.00	6.68
24	CN100	CANAL DO CUNHA	60.50	21	63.60	815.389	12.82	Urban	11.00	7.00	10.10	5.54
25	MN000	CANAL DO MANGUE	42.80	23	42.80	500.876	11.70	Urb/S.T	11.00	8.00	10.60	5.53
TOTAL		3604.10		3912.50	6.690.147						

* ( ) : Number of Data

Table APP. 8-i Annual Change of River Water Quality

/(TP) (1980-1993)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population (persons)	Population Density (p/km2)	Land use Type	80 - 86 (27 ~ 44)	87 - 89 (4 ~ 11)	90 - 91 (4 ~ 7)	92 - 93 (9)
1 CI780	CANAL CANTO DO RIO	7.40	2	7.40	41.745	5.64	Urb/S.T	1.50	1.50	1.10	1.17
2 BM760	RIO BOMBA	3.40	5	26.20	183.099	6.99	Urban	5.50	2.10	3.47	3.39
3 IB810	RIO IMBOASSU	11.60	6	30.80	138.636	4.50	Urban				0.61
4 AN740	RIO ALCANTARA	58.50	8	144.60	470.420	3.25	Urban	7.50	2.30	6.72	16.39
5 MT820	RIO MUTONDO	5.50	8			3.25	Urban				3.10
6 GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	0.54	0.50	1.01	1.56
7 CC622	RIO CACEREBU	758.40	9	846.70	336.193	0.40	N/A	0.15		0.22	0.28
8 GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69.853	0.06	N/A	0.10	0.09	0.09	0.08
*9 MC967	RIO MACACU	256.00	10-3	256.00	18.577	0.07	N/A	0.09	0.06	0.08	0.09
*10 SB998	RIO SOBERBO	45.20	10-6	132.40	17.911	0.14	N/A	0.10	0.20	0.34	0.19
11 MG580	CANAL DE MAGE	4.60	11	18.30	8.458	0.46	N/A	0.20	0.15	2.06	1.63
12 RN560	RIO RONCADOR	107.00	12	111.40	36.370	0.33	N/A	0.15	0.10	0.10	0.11
13 IR540	RIO IRIRI	8.40	13	27.80	10.684	0.38	N/A				0.28
14 SR500	RIO SURUI	53.20	14	68.80	12.910	0.19	N/A				0.16
15 ES400	RIO ESTRELA	342.50	16	342.50	302.495	0.88	N/A	0.35	0.25	0.30	0.43
*16 IN460	RIO INHOMIRIM	139.00	16-2	139.00	84.106	0.61	N/A	0.20	0.10	0.21	0.14
*17 SC420	RIO SARACURUNA	186.00	16-3	186.00	194.173	1.04	N/A	0.15	0.20	0.07	0.12
18 IA260	RIO IGUACU	544.20	17-1~5	562.80	758.010	1.35	N/A	0.50	0.50	0.82	0.77
19 SP300	RIO SARAPUI	159.80	17-6	165.50	1.012.275	6.12	Urban	2.00	2.00	3.08	2.16
20 SJ220	RIO S. J. DE MERITI	163.50	19	164.50	1.492.458	9.07	Urban	2.00	1.50	2.13	1.67
*21 AC241	RIO ACARI	57.90	19-2	57.90	438.076	7.57	Urban				2.00
22 IJ200	RIO IRAJA	27.30	20	35.70	500.276	14.01	Urban	1.50	1.50	1.78	2.07
23 PN180	CANAL DO PENHA	-	20	-				1.50	1.00	2.50	2.29
24 CN100	CANAL DO CUNHA	60.50	21	63.60	815.389	12.82	Urban	2.50	1.00	1.76	1.82
25 MN000	CANAL DO MANGUE	42.80	23	42.80	500.876	11.70	Urb/S.T	2.00	1.00	1.52	1.94
TOTAL		3604.10		3912.50	6.690.147						

* ( ) : Number of Data

Table APP. 8-1 Annual Change of River Water Quality

(DO) (1980-1993)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population (persons)	Population Density (p/km2)	Land use Type	80 - 86 (27 ~ 44)	87 - 89 (4 ~ 11)	90 - 91 (4 ~ 7)	92 - 93 (9)
1 CI780	CANAL CANTO DO RIO	7.40	2	7.40	41.745	5.64	Urb/S.T	4.0	2.7	3.1	2.8
2 BM760	RIO BOMBA	3.40	5	26.20	183.099	6.99	Urban	<0.1	<0.1	2.1	1.7
3 IB810	RIO IMBOASSU	11.60	6	30.80	138.636	4.50	Urban				2.5
4 AN740	RIO ALCANTARA	58.50	8	144.60	470.420	3.25	Urban	2.8	2.5	3.9	3.9
5 MT820	RIO MUTONDO	5.50	8			3.25	Urban				1.2
6 GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	1.8	1.5	1.6	1.3
7 CC622	RIO CACEREBU	758.40	9	846.70	336.193	0.40	N/A	2.8	2.4	2.5	1.8
8 GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69.853	0.06	N/A	5.8	4.8	5.3	3.8
*9 MC967	RIO MACACU	256.00	10-3	256.00	18.577	0.07	N/A	8.4	8.3	8.4	6.9
*10 SB998	RIO SOBERBO	45.20	10-6	132.40	17.911	0.14	N/A	7.0	1.4	4.8	4.3
11 MG580	CANAL DE MAGE	4.60	11	18.30	8.458	0.46	N/A	2.8	3.0	0.5	1.1
12 RN560	RIO RONCADOR	107.00	12	111.40	36.370	0.33	N/A	6.6	6.8	6.7	6.1
13 IR540	RIO IRIRI	8.40	13	27.80	10.684	0.38	N/A				1.3
14 SR500	RIO SURUI	53.20	14	68.80	12.910	0.19	N/A				4.4
15 ES400	RIO ESTRELA	342.50	16	342.50	302.495	0.88	N/A	2.0	2.1	2.3	1.0
*16 IN460	RIO INHOMIRIM	139.00	16-2	139.00	84.106	0.61	N/A	6.8	5.6	4.2	3.6
*17 SC420	RIO SARACURUNA	186.00	16-3	186.00	194.173	1.04	N/A	6.6	5.6	4.4	3.3
18 IA260	RIO IGUACU	544.20	17-1~5	562.80	758.010	1.35	N/A	1.0	1.2	1.0	1.1
19 SP300	RIO SARAPUI	159.80	17-6	165.50	1.012.275	6.12	Urban	<0.1	<0.1	0.2	0.7
20 SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1.492.458	9.07	Urban	<0.1	<0.1	0.1	0.5
*21 AC241	RIO ACARI	57.90	19-2	57.90	438.076	7.57	Urban				2.0
22 IJ200	RIO IRAJA	27.30	20	35.70	500.276	14.01	Urban	<0.1	<0.1	0.1	0.9
23 PN180	CANAL DO PENHA	-	20	-				<0.1	<0.1	0.5	0.4
24 CN100	CANAL DO CUNHA	60.50	21	63.60	815.389	12.82	Urban	<0.1	0.8	0.3	0.6
25 MN000	CANAL DO MANGUE	42.80	23	42.80	500.876	11.70	Urb/S.T	<0.1	<0.1	0.1	0.7
TOTAL		3604.10		3912.50	6.690.147						

* ( ) : Number of Data

Table APP. 8-2 Mean Water Quality (1990-1991) by FEEMA's Data

(BOD) · (1990 - 1991)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population Number	Population Density (p/km2)	Land use Type	1	2	3	4	5	6	7	Mean Value	Class
								1990			1991					
								MAR	JUL	AUG	APR	JUL	AUG	OCT		
1	CI780	CANAL CANTO DO RIO	7.40	2	7.40	41.745	5.64	Urb/S.T	22.00		17.00	28.00	40.00		16.00	24.60	④
2	BM760	RIO BOMBA	3.40	5	26.20	183.099	6.99	Urban	120.00		22.50	210.00	90.00	90.00	30.00	93.75	④
3	IB810	RIO IMBOASSU	11.60	6	30.80	138.636	4.50	Urban									
4	AN740	RIO ALCANTARA	58.50	8	144.60	470.420	3.25	Urban	100.00		45.000	500.00	20.00	80.00	-	149.00	④
5	MT820	RIO MUTONDO	5.50	8			3.25	Urban									
6	GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	20.00		6.00	4.00	20.00	10.00	6.00	11.00	④
7	CC622	RIO CACEREBU	758.40	9	846.70	336.193	0.40	N/A	8.00		9.00	10.00	4.00	10.00	8.00	8.17	⑤
8	GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69.853	0.06	N/A	<2.0		2.20	2.40		2.40		2.25	①
*9	MC967	RIO MACACU	256.00	10-3	256.00	18.577	0.07	N/A	4.00	<2.0	<2.0	<2.0	<2.0	2.20	<2.0	2.03	①
*10	SB998	RIO SOBERBO	45.20	10-6	132.40	17.911	0.14	N/A	10.00		20.00	16.00		130.00		44.00	④
11	MG580	CANAL DE MAGE	4.60	11	18.30	8.458	0.46	N/A	20.00		40.00	8.00		70.00		34.50	④
12	RN560	RIO RONCADOR	107.00	12	111.40	36.370	0.33	N/A	4.00		2.40	<2.0		<2.0		2.60	①
13	IR540	RIO IRIRI	8.40	13	27.80	10.684	0.38	N/A									
14	SR500	RIO SURUI	53.20	14	68.80	12.910	0.19	N/A									
15	ES400	RIO ESTRELA	342.50	16	342.50	302.495	0.88	N/A	12.00		8.00	5.60		10.00		8.90	③
*16	IN460	RIO INHOMIRIM	139.00	16-2	139.00	84.106	0.61	N/A	4.00		7.60	2.00		<2.0		3.90	②
*17	SC420	RIO SARACURUNA	186.00	16-3	186.00	194.173	1.04	N/A	4.00		6.60	2.40		14.00		6.75	③
18	IA260	RIO IGUACU	544.20	17-1~5	562.80	758.010	1.35	N/A	14.00	16.00			8.00	25.00	12.00	15.00	④
19	SP300	RIO SARAPUI	159.80	17-6	165.50	1.012.275	6.12	Urban	40.00	40.00			20.00	40.00	40.00	36.00	④
20	SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1.492.458	9.07	Urban		10.00			30.00	50.00	50.00	35.00	④
*21	AC241	RIO ACARI	57.90	19-2	57.90	438.076	7.57	Urban									
22	IJ200	RIO IRAJA	27.30	20	35.70	500.276	14.01	Urban	30.00	10.00			20.00	110.00	40.00	42.00	④
23	PN180	CANAL DO PENHA	-	20	-				30.00	40.00						35.00	
24	CN100	CANAL DO CUNHA	60.50	21	63.60	815.389	12.82	Urban	50.00	60.00			70.00	100.00	60.00	68.00	④
25	MN000	CANAL DO MANGUE	42.80	23	42.80	500.876	11.70	Urb/S.T	90.00	40.00			40.00	50.00	60.00	56.00	④
	TOTAL		3604.10		3912.50												

Class 1: 3mg/l or less
2: 5mg/l or less
3: 10mg/l or less
4: 10mg/l more

Table APP. 8-2 Mean Water Quality (1990-1991) by FEEMA's Data

(COD(Cr)) . (1990 - 1991)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population Number	Population Density (p/km2)	Land use Type	1	2	3	4	5	6	7	Mean Value
								1990			1991				
								MAR	JUL	AUG	APR	JUL	AUG	OCT	
1	CI780	CANAL CANTO DO RIO	7.40	2	7.40	41.745	5.64	Urb/S.T	70.00		35.00	55.00	130.00		90.00	76.00
2	BM760	RIO BOMBA	3.40	5	26.20	183.099	6.99	Urban	220.00		50.00	290.00	240.00	250.00	80.00	188.33
3	IB810	RIO IMBOASSU	11.60	6	30.80	138.636	4.50	Urban								
4	AN740	RIO ALCANTARA	58.50	8	144.60	470.420	3.25	Urban	560.00		60.000	740.00	560.00	400.00	440.00	460.00
5	MT820	RIO MUTONDO	5.50	8			3.25	Urban								
6	GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	40.00		35.00	30.00	40.00	40.00	40.00	37.50
7	CC622	RIO CACEREBU	758.40	9	846.70	336.193	0.40	N/A	80.00		25.00	30.00	20.00	20.00	30.00	34.17
8	GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69.853	0.06	N/A			10.00	20.00		10.00		13.33
*9	MC967	RIO MACACU	256.00	10-3	256.00	18.577	0.07	N/A		<10	<10	<10	<10	<10	15.00	10.83
*10	SB998	RIO SOBERBO	45.20	10-6	132.40	17.911	0.14	N/A			70.00	30.00		320.00		140.00
11	MG580	CANAL DE MAGE	4.60	11	18.30	8.458	0.46	N/A				50.00		240.00		145.00
12	RN560	RIO RONCADOR	107.00	12	111.40	36.370	0.33	N/A			15.00	<10		10.00		11.67
13	IR540	RIO IRIRI	8.40	13	27.80	10.684	0.38	N/A								
14	SR500	RIO SURUI	53.20	14	68.80	12.910	0.19	N/A								
15	ES400	RIO ESTRELA	342.50	16	342.50	302.495	0.88	N/A			30.00	20.00		30.00		26.67
*16	IN460	RIO INHOMIRIM	139.00	16-2	139.00	84.106	0.61	N/A			20.00	10.00		10.00		13.33
*17	SC420	RIO SARACURUNA	186.00	16-3	186.00	194.173	1.04	N/A			15.000	80.00		15.00		36.67
18	IA260	RIO IGUACU	544.20	17-1~5	562.80	758.010	1.35	N/A	110.00	40.00			30.00		120.00	75.00
19	SP300	RIO SARAPUI	159.80	17-6	165.50	1.012.275	6.12	Urban	100.00	80.00			70.00	130.00	110.00	98.00
20	SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1.492.458	9.07	Urban		120.00			115.00		170.00	135.00
*21	AC241	RIO ACARI	57.90	19-2	57.90	438.076	7.57	Urban								
22	IJ200	RIO IRAJA	27.30	20	35.70	500.276	14.01	Urban		110.00			75.00	255.00	200.00	160.00
23	PN180	CANAL DO PENHA	-	20	-					180.00						180.00
24	CN100	CANAL DO CUNHA	60.50	21	63.60	815.389	12.82	Urban		170.00			180.00	140.00	150.00	160.00
25	MN000	CANAL DO MANGUE	42.80	23	42.80	500.876	11.70	Urb/S.T		120.00			120.00		150.00	130.00
TOTAL			3604.10		3912.50											

Table APP. 8-2 Mean Water Quality (1990-1991) by FEEMA's Data

(TN) (1990 - 1991)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population Number	Population Density (p/km2)	Land use Type	1	2	3	4	5	6	7	Mean Value
								1990			1991				
								MAR	JUL	AUG	APR	JUL	AUG	OCT	
1	C1780	CANAL CANTO DO RIO	7.40	2	7.40	41.745	5.64	Urb/S.T	17.20		13.47	16.05	24.10		20.50	18.26
2	BM760	RIO BOMBA	3.40	5	26.20	183.099	6.99	Urban	40.30		18.71	27.02	29.02	30.09	25.80	28.49
3	IB810	RIO IMBOASSU	11.60	6	30.80	138.636	4.50	Urban								
4	AN740	RIO ALCANTARA	58.50	8	144.60	470.420	3.25	Urban	30.20		13.46	25.06	21.03	29.00	22.00	23.46
5	MT820	RIO MUTONDO	5.50	8			3.25	Urban								
6	GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	10.20		13.25	1.50	15.05	20.02	9.50	11.59
7	CC622	RIO CACEREBU	758.40	9	846.70	336.193	0.40	N/A	4.20		3.05	1.04	3.60	2.30	1.40	2.60
8	GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69.853	0.06	N/A	0.40		1.45	1.20		1.00		1.01
*9	MC967	RIO MACACU	256.00	10-3	256.00	18.577	0.07	N/A	1.20	0.60	1.20	4.20	1.23	1.20	0.90	1.50
*10	SB998	RIO SOBERBO	45.20	10-6	132.40	17.911	0.14	N/A	1.20		2.00	2.20		2.50		1.98
11	MG580	CANAL DE MAGE	4.60	11	18.30	8.458	0.46	N/A	14.00		29.52	9.02		20.00		18.13
12	RN560	RIO RONCADOR	107.00	12	111.40	36.370	0.33	N/A	0.25		1.80	1.30		1.20		1.14
13	IR540	RIO IRIRI	8.40	13	27.80	10.684	0.38	N/A								
14	SR500	RIO SURUI	53.20	14	68.80	12.910	0.19	N/A								
15	ES400	RIO ESTRELA	342.50	16	342.50	302.495	0.88	N/A	5.00		3.10	2.80		3.90		3.70
*16	IN460	RIO INHOMIRIM	139.00	16-2	139.00	84.106	0.61	N/A	1.60		1.60	1.70		1.50		1.60
*17	SC420	RIO SARACURUNA	186.00	16-3	186.00	194.173	1.04	N/A	1.00		2.00	1.50		2.40		1.73
18	IA260	RIO IGUACU	544.20	17-1~5	562.80	758.010	1.35	N/A	14.54	9.01			3.60	10.02	5.51	8.54
19	SP300	RIO SARAPUI	159.80	17-6	165.50	1.012.275	6.12	Urban	19.02	16.01			10.02	21.02	17.00	16.61
20	SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1.492.458	9.07	Urban		15.02			14.02	15.03	17.00	15.27
*21	AC241	RIO ACARI	57.90	19-2	57.90	438.076	7.57	Urban								
22	IJ200	RIO IRAJA	27.30	20	35.70	500.276	14.01	Urban	11.00	15.10			10.05	18.04	19.02	14.64
23	PN180	CANAL DO PENHA	-	20	-				22.00	31.01						26.51
24	CN100	CANAL DO CUNHA	60.50	21	63.60	815.389	12.82	Urban	11.00	17.00			16.02	14.02	13.00	14.21
25	MN000	CANAL DO MANGUE	42.80	23	42.80	500.876	11.70	Urb/S.T	17.00	28.04			12.03	13.03	17.00	17.42
	TOTAL		3604.10		3912.50											

*:Total Nitrogen = Total kjedahl Nitrogen + Nitrate Nitrogen

Table APP. 8-2 Mean Water Quality (1990-1991) by FEEMA's Data

(K-N) (1990 - 1991)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population Number	Population Density (p/km2)	Land use Type	1	2	3	4	5	6	7	Mean Value
								1990			1991				
								MAR	JUL	AUG	APR	JUL	AUG	OCT	
1	C1780	CANAL CANTO DO RIO	7.40	2	7.40	41.745	5.64	Urb/S.T	17.00		12.50	16.00	24.00		20.00	17.90
2	BM760	RIO BOMBA	3.40	5	26.20	183.099	6.99	Urban	40.00		18.50	27.00	29.00	30.00	25.00	28.25
3	IB810	RIO IMBOASSU	11.60	6	30.80	138.636	4.50	Urban								
4	AN740	RIO ALCANTARA	58.50	8	144.60	470.420	3.25	Urban	30.00		13.000	25.00	21.00	20.00	14.00	20.50
5	MT820	RIO MUTONDO	5.50	8			3.25	Urban								
6	GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	10.00		13.00	1.20	15.00	20.00	8.00	11.20
7	CC622	RIO CACEREBU	758.40	9	846.70	336.193	0.40	N/A	4.00		1.60	1.00	3.00	1.20	1.00	1.97
8	GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69.853	0.06	N/A	0.20		1.20	1.00		0.80		0.80
*9	MC967	RIO MACACU	256.00	10-3	256.00	18.577	0.07	N/A	1.00	0.40	1.00	4.00	1.00	1.00	0.60	1.29
*10	SB998	RIO SOBERBO	45.20	10-6	132.40	17.911	0.14	N/A	1.00		1.60	2.00		2.40		1.75
11	MG580	CANAL DE MAGE	4.60	11	18.30	8.458	0.46	N/A	14.00		20.50	9.00		20.00		15.88
12	RN560	RIO RONCADOR	107.00	12	111.40	36.370	0.33	N/A	0.25		1.00	1.00		0.80		0.76
13	IR540	RIO IRIRI	8.40	13	27.80	10.684	0.38	N/A								
14	SR500	RIO SURUI	53.20	14	68.80	12.910	0.19	N/A								
15	ES400	RIO ESTRELA	342.50	16	342.50	302.495	0.88	N/A	5.00		3.00	2.40		3.60		3.50
*16	IN460	RIO INHOMIRIM	139.00	16-2	139.00	84.106	0.61	N/A	1.60		1.20	1.00		1.00		1.20
*17	SC420	RIO SARACURUNA	186.00	16-3	186.00	194.173	1.04	N/A	1.00		1.700	1.00		1.80		1.38
18	IA260	RIO IGUACU	544.20	17-1~5	562.80	758.010	1.35	N/A	14.50	9.00			3.00	10.00	5.50	8.40
19	SP300	RIO SARAPUI	159.80	17-6	165.50	1.012.275	6.12	Urban	19.00	16.00			10.00	21.00	17.00	16.60
20	SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1.492.458	9.07	Urban		15.00			14.00	15.00	17.00	15.25
*21	AC241	RIO ACARI	57.90	19-2	57.90	438.076	7.57	Urban								
22	IJ200	RIO IRAJA	27.30	20	35.70	500.276	14.01	Urban	11.00	15.00			10.00	18.00	19.00	14.60
23	PN180	CANAL DO PENHA	-	20	-				22.00	31.00						26.50
24	CN100	CANAL DO CUNHA	60.50	21	63.60	815.389	12.82	Urban	11.00	15.00			16.00	14.00	13.00	13.80
25	MN000	CANAL DO MANGUE	42.80	23	42.80	500.876	11.70	Urb/S.T	17.00	28.00			12.00	13.00	17.00	17.40
	TOTAL		3604.10		3912.50											

Table APP. 8-2 Mean Water Quality (1990-1991) by FEEMA's Data

(NH4-N) (1990 - 1991)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population Number	Population Density (p/km2)	Land use Type	1	2	3	4	5	6	7	Mean Value
								1990			1991				
								MAR	JUL	AUG	APR	JUL	AUG	OCT	
1	CI780	CANAL CANTO DO RIO	7.40	2	7.40	41,745	5.64	Urb/S.T	11.00		11.50	4.00	15.00		18.00	11.90
2	BM760	RIO BOMBA	3.40	5	26.20	183,099	6.99	Urban	30.00		11.00	3.40	20.00	17.00	23.00	17.40
3	IB810	RIO IMBOASSU	11.60	6	30.80	138,636	4.50	Urban								
4	AN740	RIO ALCANTARA	58.50	8	144.60	470,420	3.25	Urban	13.00		5.000	1.00	10.00	6.00	8.00	7.17
5	MT820	RIO MUTONDO	5.50	8			3.25	Urban								
6	GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	9.00		10.50	1.00	10.00	10.00	8.00	8.08
7	CC622	RIO CACEREBU	758.40	9	846.70	336,193	0.40	N/A	2.00		0.45	0.45	0.20	0.15	0.07	0.55
8	GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69,853	0.06	N/A	0.04		0.10	0.08		0.06		0.07
*9	MC967	RIO MACACU	256.00	10-3	256.00	18,577	0.07	N/A	0.07	0.08	0.11	3.00	0.15	0.40	0.09	0.56
*10	SB998	RIO SOBERBO	45.20	10-6	132.40	17,911	0.14	N/A	<.01		0.24	0.20		0.45		0.22
11	MG580	CANAL DE MAGE	4.60	11	18.30	8,458	0.46	N/A	11.00		16.00	3.40		8.00		9.60
12	RN560	RIO RONCADOR	107.00	12	111.40	36,370	0.33	N/A	0.10		0.35	0.10		0.20		0.19
13	IR540	RIO IRIRI	8.40	13	27.80	10,684	0.38	N/A								
14	SR500	RIO SURUI	53.20	14	68.80	12,910	0.19	N/A								
15	ES400	RIO ESTRELA	342.50	16	342.50	302,495	0.88	N/A	5.00		0.70	0.40		2.00		2.03
*16	IN460	RIO INHOMIRIM	139.00	16-2	139.00	84,106	0.61	N/A	0.40		0.25	0.05		0.40		0.28
*17	SC420	RIO SARACURUNA	186.00	16-3	186.00	194,173	1.04	N/A	0.50		0.850	0.10		0.60		0.51
18	IA260	RIO IGUACU	544.20	17-1~5	562.80	758,010	1.35	N/A	8.50	8.00			2.00	6.00	4.60	5.82
19	SP300	RIO SARAPUI	159.80	17-6	165.50	1,012,275	6.12	Urban	16.00	13.00			10.00	15.00	14.00	13.60
20	SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1,492,458	9.07	Urban		11.00			13.00	10.00	15.00	12.25
*21	AC241	RIO ACARI	57.90	19-2	57.90	438,076	7.57	Urban								
22	IJ200	RIO IRAJA	27.30	20	35.70	500,276	14.01	Urban	8.00	12.00			9.00	9.00	10.00	9.60
23	PN180	CANAL DO PENHA	-	20	-				16.00	18.00						17.00
24	CN100	CANAL DO CUNHA	60.50	21	63.60	815,389	12.82	Urban	7.50	9.00			13.00	9.00	12.00	10.10
25	MN000	CANAL DO MANGUE	42.80	23	42.80	500,876	11.70	Urb/S.T	13.00	14.00			11.00	8.00	7.00	10.60
TOTAL			3604.10		3912.50											

Table APP. 8-2 Mean Water Quality (1990-1991) by FEEMA's Data

(TP) (1990 - 1991)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population Number	Population Density (p/km2)	Land use Type	1	2	3	4	5	6	7	Mean Value
								1990			1991				
								MAR	JUL	AUG	APR	JUL	AUG	OCT	
1	CI780	CANAL CANTO DO RIO	7.40	2	7.40	41.745	5.64	Urb/S.T	1.00		0.85	1.00	2.00		0.65	1.10
2	BM760	RIO BOMBA	3.40	5	26.20	183.099	6.99	Urban	4.00		3.40	5.00	3.40	4.00	1.00	3.47
3	IB810	RIO IMBOASSU	11.60	6	30.80	138.636	4.50	Urban								
4	AN740	RIO ALCANTARA	58.50	8	144.60	470.420	3.25	Urban	6.00		4.00	20.00	3.20	6.00	1.10	6.72
5	MT820	RIO MUTONDO	5.50	8			3.25	Urban								
6	GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	1.00		0.75	0.50	0.70	2.40	0.70	1.01
7	CC622	RIO CACEREBU	758.40	9	846.70	336.193	0.40	N/A	0.35		0.15	0.20	0.20	0.15	0.25	0.22
8	GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69.853	0.06	N/A	0.10		0.09	0.10		0.06		0.09
*9	MC967	RIO MACACU	256.00	10-3	256.00	18.577	0.07	N/A	0.06	0.06	0.08	0.06	0.09	0.10	0.10	0.08
*10	SB998	RIO SOBERBO	45.20	10-6	132.40	17.911	0.14	N/A	0.70		0.18	0.20		0.30		0.34
11	MG580	CANAL DE MAGE	4.60	11	18.30	8.458	0.46	N/A	1.00		3.50	0.75		3.00		2.06
12	RN560	RIO RONCADOR	107.00	12	111.40	36.370	0.33	N/A	0.10		0.15	0.06		0.08		0.10
13	IR540	RIO IRIRI	8.40	13	27.80	10.684	0.38	N/A								
14	SR500	RIO SURUI	53.20	14	68.80	12.910	0.19	N/A								
15	ES400	RIO ESTRELA	342.50	16	342.50	302.495	0.88	N/A	0.50		0.30	0.10		0.30		0.30
*16	IN460	RIO INHOMIRIM	139.00	16-2	139.00	84.106	0.61	N/A	0.50		0.15	0.10		0.10		0.21
*17	SC420	RIO SARACURUNA	186.00	16-3	186.00	194.173	1.04	N/A	0.05		0.10	0.10		0.05		0.07
18	IA260	RIO IGUACU	544.20	17-1~5	562.80	758.010	1.35	N/A	0.50	0.90			0.40	1.70	0.60	0.82
19	SP300	RIO SARAPUI	159.80	17-6	165.50	1.012.275	6.12	Urban	4.00	3.00			2.00	3.40	3.00	3.08
20	SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1.492.458	9.07	Urban		2.00			2.00	2.70	1.80	2.13
*21	AC241	RIO ACARI	57.90	19-2	57.90	438.076	7.57	Urban								
22	IJ200	RIO IRAJA	27.30	20	35.70	500.276	14.01	Urban	1.00	2.00			1.50	3.50	0.90	1.78
23	PN180	CANAL DO PENHA	-	20	-				1.00	4.00						2.50
24	CN100	CANAL DO CUNHA	60.50	21	63.60	815.389	12.82	Urban	0.80	2.00			2.50	2.50	1.00	1.76
25	MN000	CANAL DO MANGUE	42.80	23	42.80	500.876	11.70	Urb/S.T	1.00	2.00			2.00	1.70	0.90	1.52
TOTAL		3604.10		3912.50											

Table APP. 8-2 Mean Water Quality (1990-1991) by FEEMA's Data

(DO) (1990 - 1991)

unit:mg/l

No	Name	Covered Basin Area (Km2)	NO.	Basin Area (Km2)	Population Number	Population Density (p/km2)	Land use Type	1	2	3	4	5	6	7	Mean Value
								1990			1991				
								MAR	JUL	AUG	APR	JUL	AUG	OCT	
1	CI780	CANAL CANTO DO RIO	7.40	2	7.40	41,745	5.64	Urb/S.T	2.00		4.40	2.40	3.20		3.40	3.08
2	BM760	RIO BOMBA	3.40	5	26.20	183,099	6.99	Urban	<.1		5.40	<.1	1.20	2.20	3.80	2.13
3	IB810	RIO IMBOASSU	11.60	6	30.80	138,636	4.50	Urban								
4	AN740	RIO ALCANTARA	58.50	8	144.60	470,420	3.25	Urban	2.20		3.400	2.80	5.40	5.20	4.40	3.90
5	MT820	RIO MUTONDO	5.50	8			3.25	Urban								
6	GX720	RIO GUAXINDIBA	11.80	8			3.25	Urban	<.1		2.70	2.40	1.00	1.00	2.60	1.63
7	CC622	RIO CACEREBU	758.40	9	846.70	336,193	0.40	N/A	1.80		3.80	1.20	3.00	2.60	2.80	2.53
8	GP600	RIO GUAPIMIRIM	1233.70	10	1253.10	69,853	0.06	N/A	5.60		5.50	5.00		5.20		5.33
*9	MC967	RIO MACACU	256.00	10-3	256.00	18,577	0.07	N/A	7.20	8.80	9.10	8.00	8.60	9.00	8.40	8.44
*10	SB998	RIO SOBERBO	45.20	10-6	132.40	17,911	0.14	N/A	6.80		2.60	6.80		2.80		4.75
11	MG580	CANAL DE MAGE	4.60	11	18.30	8,458	0.46	N/A	<.1		0.65	0.40		1.00		0.54
12	RN560	RIO RONCADOR	107.00	12	111.40	36,370	0.33	N/A	6.00		6.10	7.40		7.40		6.73
13	IR540	RIO IRIRI	8.40	13	27.80	10,684	0.38	N/A								
14	SR500	RIO SURUI	53.20	14	68.80	12,910	0.19	N/A								
15	ES400	RIO ESTRELA	342.50	16	342.50	302,495	0.88	N/A	0.60		2.00	4.20		2.20		2.25
*16	IN460	RIO INHOMIRIM	139.00	16-2	139.00	84,106	0.61	N/A	2.00		3.50	7.00		4.20		4.18
*17	SC420	RIO SARACURUNA	186.00	16-3	186.00	194,173	1.04	N/A	3.00		4.300	7.60		2.80		4.43
18	IA260	RIO IGUACU	544.20	17-1~5	562.80	758,010	1.35	N/A	0.10	1.00			3.80	<.1	<.1	1.02
19	SP300	RIO SARAPUI	159.80	17-6	165.50	1,012,275	6.12	Urban	<.01	0.80			<.01	<.01	<.01	0.19
20	SJ220	RIO S.J.DE MERITI	163.50	19	164.50	1,492,458	9.07	Urban		<.1			<.1	<.1	<.1	0.10
*21	AC241	RIO ACARI	57.90	19-2	57.90	438,076	7.57	Urban								
22	IJ200	RIO IRAJA	27.30	20	35.70	500,276	14.01	Urban	<.1	<.1			<.1	<.1	<.1	0.10
23	PN180	CANAL DO PENHA	-	20	-				<.1	0.80						0.45
24	CN100	CANAL DO CUNHA	60.50	21	63.60	815,389	12.82	Urban	<.1	1.00			<.1	<.1	<.1	0.28
25	MN000	CANAL DO MANGUE	42.80	23	42.80	500,876	11.70	Urb/S.T	<.1	<.1			<.1	<.1	<.1	0.10
TOTAL		3604.10		3912.50											