(The th) Month/Annual Monitoring Report for the Period
from (Month Day, Year) to (Month Day, Year)
for Project "Macaé Thermal Power Plant"

(Date)

Project Company: "EL PASO RIO CLARO LTDA"

Summary
Project record: Date of investment agreement signed: (MM/DD/YYYY)
Date of construction started: (MM/DD/YYYY)
Project completion date: (MM/DD/YYYY)
Date of operation started: (MM/DD/YYYY)

Period covered by this report: From (MM/DD/YYYY) To (MM/DD/YYYY)
Project's activities during the period:

Please provide a brief description of the Project's activities, such as construction progress or operations, which is relevant to the environmental performance of the Project.

Compliance evaluation:
Compliance with host country environmental requirements: Yes ( ) No ( )
Compliance with World Bank environmental policies and guidelines: Yes ( ) No ( )
Compliance with other environmental covenants agreed with IFC: Yes ( ) No ( )
Notable performance/explanations of non-compliance:

Please summarize (i) notable environmental performance that the Project Company wishes to emphasize to IFC, or (ii) explanations of non-compliance and corrective actions taken/to be taken if the Project was not in compliance.

Accidents (spills, fires, injuries, etc) and Fatalities

Please summarize whether the Project Company had any of these.

Public Consultations

Please summarize (i) whether the Project Company received any complaints (or lawsuits filed), from local communities, NGOs, workers, media, local regulatory bodies, etc., or (ii) notable community relations activities.

Contact person of the Project Company about this report:
Name: ( ) Title: ( )
Address: ( )
Tel: ( ) Fax: ( ) E-mail: ( )

Prepared [or Verified (*)] by:
Firm: (Environmental Consulting Firm) Name: ( )
Address: ( )
Tel: ( ) Fax: ( ) E-mail: ( )
(*) Please attach a copy of the verification.

1. Environmental management

1-1. Environmental management system

Please provide:

Description of updated environmental management system of the Project Company, Environmental Supervision Unit (as referenced in the PBA, page 6-2) including the names of:

(a) Environmental Coordinaor:

(b) Health and Safety Specialist:
(c) Public Relations Specialist:

1-2. Investment and operational cost for environmental management

Please provide the following as appropriate:
-Summary of the additional investment made and operational cost incurred (with major items such as monitoring and compensation) during the reporting period for environmental management.

1-3. Improvement of environmental management

Please provide the following as appropriate:
-Summary of activities and programs implemented during the reporting period to improve Project Company's environmental management such as establishment/revision of environmental policies, environmental management manuals, corporate environmental action plans, and implementation of environmental training programs, etc.
-Summary of major environmental and social issues/challenges that Project Company recognizes important for the next year.

2.Project's activities relevant to environmental performance (including GHG emissions assessment)

Electricity Generation Technology: Simple-cycle gas turbine (LM6000, General Electric)
Fuel:Natural Gas
NOx emission control:Water Injection
Stack height: 16.7m

Table 2-1: Total, GT01-GT10

	Abbr. / Calculation	Unit	Total of GT-01 – GT20	GT-01	GT-02	GT-03	GT-04	GT-05	GT-06	GT-07	GT-08	GT-09	GT-10
Generating capacity (gross)	MW	MW	895	44.75	44.75	44.75	44.75	44.75	44.75	44.75	44.75	44.75	44.75
Electricity generated (gross)	GWhg	GWh											
Electricity generated (net)	GWhn	GWh											
Capacity factor	GWhg / (MW x 8760 / 1000)	%											
Gas Consumption	Ton	Ton											
Average heat content (HHV)	HCh	million Btu / ton											
Average heat content (LHV)	HCl	million Btu / ton											
Heat input (HHV)	HHV=Ton x HCh	million Btu											
Heat input (LHV)	LHV=Ton x HCl	million Btu											
Gross	GWhg x	%											

Gross Thermal Efficiency (HHV)	GWhg x 3,412 / HHV x 100	%											
Gross Thermal Efficiency (LHV)	GWhg x 3,412 / LHV x 100	%											
Heat Rate (HHV)	HHV / GWhg	Btu/kWh											
Heat Rate (LHV)	LHV / GWhg	Btu/kWh											
CO_2 emissions (as Carbon) *	CE=(LHV / 947.8) x 15.3 x 0.995	ton-C											
CO_2 emissions (as Carbon Dioxide)	CE x 3.667	ton-CO_2											

Note*: Assumptions used include: 1 TJ = 947.8 million Btu. Carbon Emission Factor = 15.3 tC/TJ (for Natural Gas, dry, LHV basis). Fraction of Carbon Oxidised = 0.995 (Gas). These assumptions are from “Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Workbook (Volume 2)”. If the Project Company prefers to using country-specific or project-specific assumptions, please do so and add the description of those assumptions as a footnote.

Table 2-2: GT11-GT20

	Abbr. / Calculation	Unit	GT-11	GT-12	GT-13	GT-14	GT-15	GT-16	GT-17	GT-18	GT-19	GT-20
Generating capacity (gross)	MW	MW	44.75	44.75	44.75	44.75	44.75	44.75	44.75	44.75	44.75	44.75
Electricity generated (gross)	GWhg	GWh										
Electricity generated (net)	GWhn	GWh										
Capacity factor	GWhg / (MW x 8760 / 1000)	%										
Gas Consumption	Ton	Ton										
Average heat content (HHV)	HCh	million Btu / ton										
Average heat content (LHV)	HCl	million Btu / ton										
Heat input (HHV)	HHV=Ton x HCh	million Btu										
Heat input (LHV)	LHV=Ton x HCl	million Btu										
Gross Thermal	GWhg x 3,412 /	%										

DEVELOPED BY	REVIEWED BY	APPROVED BY

Gross Thermal Efficiency (HHV)	GWhg x 3,412 / HHV x 100	%										
Gross Thermal Efficiency (LHV)	GWhg x 3,412 / LHV x 100	%										
Heat Rate (HHV)	HHV / GWhg	Btu/kWh										
Heat Rate (LHV)	LHV / GWhg	Btu/kWh										

Note: Gross Thermal Efficiency (HHV) and Gross Thermal Efficiency (LHV) can be calculated as below for both Table 2-1 and Table 2-2:
Percent efficiency of equipment = perfect heat rate (3,412 Btu/kWh) x (1 / equipment heat rate (Btu/kWh)) x 100

3. Stack emissions

Items	Monitoring Results	Note
Monitored NOx emission - maximum hourly average	**mg/Nm^3 (dry, 0 Celsius, 15%O_2)** **ppm (dry, 0 Celsius, 15%O_2)**	Observed by GT No. ** at yy/mm/dd/hh
- maximum daily average	mg/Nm^3 (dry, 0 Celsius, 15%O_2) ppm (dry, 0 Celsius, 15%O_2)	Observed by GT No. ** at yy/mm/dd
- annual average	mg/Nm^3 (dry, 0 Celsius, 15%O_2) ppm (dry, 0 Celsius, 15%O_2)	Average of GT No. 01-20
- annual mass emission	ton / year	Total mass emission by GT No. 01-20
- electricity produced	GWh / year	Total electricity generation by GT No. 01-20
- annual average emission rate	g-NOx (as NO_2) / kWh	Average of GT No. 01-20
Guaranteed, etc. - manufacturer specification for LM6000 - emission rate used in the EIA	**32 ppm (dry, 0 Celsius, 15%O_2) (*1)** **12.5 g/s/GT (*2)**	*1: Supplemental EIA Report, April 2002, Executive Summary, page 8. *2: Supplemental EIA Report, April 2002, Section 8, Table 3.
Host Country Regulation	Compliance evaluated by ambient air quality impacts – Res. CONAMA 03/90	Supplemental EIA Report, April 2002, Executive

Host Country Regulation	Compliance evaluated by ambient air quality impacts – Res. CONAMA 03/90	Supplemental EIA Report, April 2002, Executive Summary, page 7.
NOx emission control - Water injection - Total mount of water taken from Macae River	Was water injection on all the time when GT was generating electricity? Yes ( ) No ( ) _____ m^3 per year _____ Maximum daily average (l/s)	Water permit: 86 l/s (24h/day) DECREE No. 29204, Sep 14, 2001
World Bank Guideline (1998 PPAH)	**125 mg/Nm^3 (dry, 0 Celsius, 15%O_2, 1 atmosphere), or about 61 ppm**	**To be achieved for 95% of the time that the plant or unit is operating, to be calculated as a proportion of annual operating hours.**
Compliance - Host Country Regulation - World Bank Guideline	Yes ( ) No ( ) Yes ( ) No ( )	

12.5 g/s/GT (*2)
*1: Supplemental EIA Report, April 2002, Executive Summary, page 8.
*2: Supplemental EIA Report, April 2002, Section 8, Table 3.
Host Country RegulationCompliance evaluated by ambient air quality impacts – Res. CONAMA 03/90 Supplemental EIA Report, April 2002, Executive Summary, page 7.
NOx emission control - Water injection

-Total amount of water taken from Macae River
Was water injection on all the time when GT was generating electricity? Yes ( ) No ( )
m3 per year
Maximum daily average (l/s)

Water permit: 86 l/s (24h/day) DECREE No. 29204, Sep 14, 2001
World Bank Guideline
(1998 PPAH)125 mg/Nm3 (dry, 0 Celsius, 15%O2, 1 atmosphere), or about 61 ppm
To be achieved for 95% of the time that the plant or unit is operating, to be calculated as a proportion of annual operating hours.
Compliance
-Host Country Regulation Yes ( ) No ( )

-World Bank Guideline Yes ( ) No ( )

Please provide the following as appropriate:
-Summary of the emission monitoring data for each Gas Turbine.
-Description of current the emission monitoring system (methods, sampling point, etc.).
-Corrective actions taken/to be taken in case of non-compliance.

4. Ambient air

Table 4-1: Summary of Ambient Air Quality Compliance (Station A: Within the Macae Plant Site)

Parameter	unit	World Bank environmental guidelines	Host Country standards	Result of monitoring	Compliance (Yes / No)
NO_2 - Max 1-hour Ave. - Max 24-hour Ave. - Annual Ave.	$\mu g / m^3$	N.A. 150 100	320 N.A. 100		
Ozone - Max 1-hour Ave.	$\mu g / m^3$	N.A.	160		

Table 4-2: Summary of Ambient Air Quality Compliance (Station B: City of Macae)

Parameter	unit	World Bank environmental guidelines	Host Country standards	Result of monitoring	Compliance (Yes / No)
NO_2 - Max 1-hour Ave. - Max 24-hour Ave. - Annual Ave.	$\mu g / m^3$	N.A. 150 100	320 N.A. 100		
Ozone - Max 1-hour Ave.	$\mu g / m^3$	N.A.	160		

Please provide the following as appropriate:
-Summary of monitoring data, description of monitoring methodologies, maps indicating monitoring spots, etc.
-Description of other major air pollution sources in the same airshed and estimated Project's incremental impacts.
-Corrective actions taken/to be taken in case of non-compliance.

5. Liquid effluents and water usage

Table 5-1: Summary of Liquid Effluent Compliance (Industrial Effluents and Sanitary Effluents)

PARAMETERS	APPLICABLE LIMITS -MACAE DISCHARGE	ART.21 RES. CONAMA 20/86	FEEMA NT-202.R-10	WORLD BANK ENVIRONMENTAL GUIDELINES (NEW THERMAL POWER PLANTS)	WORLD BANK (GENERAL ENVIRONMENTAL GUIDELINES)
Temperature	<40 Celsius	<40 Celsius increase at the edge of mixing zone < 3 Celsius	<40 Celsius increase at the edge of mixing zone < 3 Celsius	Increase at the edge of mixing zone < 3 Celsius	Increase at the edge of mixing zone < 3 Celsius
pH	6-9	5-9	5-9	6-9	6-9
Oil and grease	10	20	20	10	10
Total Suspended Solids (TSS)	50	NR	NR	50	50
Total Residual Chlorine	0.2	NR	5	0.2	0.2
Dissolved Solids	500	NR	NR	NR	NR
Turbidity	NR	NR	NR	NR	NR
Settled Solids	< 1ml/l, Imhof text, 1 hour	< 1ml/l, Imhof text, 1 hour	NR	NR	NR
Dissolved Oxygen	NR	NR	NR	NR	NR
Metals (total)	10	NR	NR	NR	10
Chromium (total)	0.5	0.5	0.5	0.5	0.5
Lead	NR	NR	NR	NR	0.1
Copper	0.5	1.0	0.5	0.5	0.5
Iron	1.0	15	15	1.0	3.5
Manganese	NR	NR	NR	NR	NR
Aluminum	NR	NR	NR	NR	NR
Zinc	1.0	5.0	1.0	1.0	2.0
Conductivity	NR	NR	NR	NR	NR
Chlorides	750	NR	NR	NR	NR
Phenol (Phenolic substances C6H6OH)	0.2	0.5	0.2	NR	0.5
Phosphates (PO4)	6	NR	NR	NR	6
Sulfates	500	NR	NR	NR	
Sulfides	NR	NR	NR	NR	1.0
Nitrates	10	10	NR	NR	
Nitrogen (Ammonia)	NR	NR	NR	NR	10 (Ammonia)
Total Nitrogen	NR	NR	NR	NR	NR
Total Phosphorus	NR	NR	NR	NR	NR
Sulfides	NR	NR	NR	NR	NR
Surfactant substances	NR	NR	NR	NR	NR
COD	150	NR	150	NR	250
BOD	15	NR	>80% Reduction	NR	50
Toxic Organic Compounds – (Chlorinated Organic and Phosforic+PCB)	NR	NR	NR	NR	NR
Toxicity	NR	NR	NR	NR	NR
Coliforms	400/100 ml	NR	Controle via DBO	NR	400/100ml

NR – not regulated
Note: discharge parameters after treatment, considering the characteristics of the intake raw water and the chemical products to be used in water treatment, cooling tower and demineralization units; WB limits as per Pollution Prevention and Abatement Handbook – Guidelines for New Thermal Power Plants and General Guidelines, Art 21, Res. CONAMA 20 or Art 23, Res. CONAMA 20 – and NT.202 R.10, FEEMA, RJ.

Please provide the following as appropriate:
-Summary of monitoring data, description of monitoring methodologies, maps indicating monitoring spots, etc.
-Description of water use balance (intake, evaporation, make-up, treatment, discharge) with key water quality levels.
-Corrective actions taken/to be taken in case of non-compliance.

Table 5-2: Water Intake and Discharge

	Decree No. 29204, September 14, 2001 "Grants to El Paso Rio Claro Ltda"	**Result of continuous monitoring (maximum of the reporting year)**	**Compliance (Yes / No)**
Water intake from Macae River	86 l/s (24 hours / day)		
Water discharge to Macae River	12 l/s (24 hours / day)		

6.Ambient noise

Table 6.1: Summary of ambient noise compliance

Receptor	unit	World Bank environmental guidelines(*)	Host Country standards	Result of monitoring	Compliance (Yes / No)
Residential, institutional, educational Day Time Night Time	dBA	55 45			
Industrial, commercial Day Time Night Time		70 70	70 60		
Distance from the site boundary to the closest noise receptors	m	Residential receptor: Industrial receptor:			

Note (*): Noise levels to be measured at noise receptors located outside the Project site boundary.

Please provide the following as appropriate:
-Summary of monitoring data, description of monitoring methodologies, maps indicating monitoring spots and location of the noise receptors, etc.
-Corrective actions taken/to be taken in case of non-compliance.

7. Solid and liquid (non-effluent) waste

Table 7.1 – Summary of solid and liquid waste

	World Bank environmental guidelines	**Host Country regulation**	**Project Company's operation (describe actual procedures)**	**Compliance**
Recycling of materials	Recycle where possible. If recycling is not practical, wastes must be disposed of in an environmentally acceptable manner and in compliance with local laws and regulations.	Res. CONAMA 06/86		
Disposal of hazardous materials, solvents, oils, etc.	All hazardous materials, process residues, solvents, oils, and sludges from raw water, process wastewater and domestic sewage treatment systems must be disposed of in a manner to prevent the contamination of soil, groundwater and surface waters.	Res. CONAMA 06/86		

Please provide the following as appropriate:
-Corrective actions taken/to be taken in case of non-compliance.

8. Other general environmental and health and safety requirements

	World Bank environmental guidelines	Host Country regulation	Project Company's operation	Compliance
Formulations containing chromates	Should be avoided in water treatment processes.			
PCBs	Transformers or equipment containing PCBs should not be installed.	NA	NA (*)	NA
CFCs	Processes, equipment and central cooling systems involving the use or potential release to the environment of CFCs (including Halon) should not be installed.			
Spill prevention	Storage and liquid impoundment areas for fuels, raw and in-process materials, solvents, wastes and finished products should be designed with secondary containment (e.g. dikes, berms) to prevent spills and the contamination of soil, groundwater and surface waters.			
Workplace noise	Personnel must use hearing protection when exposed to noise levels above 85 dBA			

NA – not applicable

Please provide the following as appropriate:

-Corrective actions taken/to be taken in case of non-compliance.

9. Accidents (spills, fires, injuries, etc) and fatalities

Please provide the following as appropriate:
-Detailed statistics of any accidents, incidents or fatalities that occurred over the reporting period, analysis of accumulated statistics in comparison with national and international industry practice.
- Details of corective actions taken/to be taken in case accidents and fatalities occurred.

10. Land use

	Unit	Areas already used for power plant itself	Tree-planted areas	Unused areas (for future expansion, buffer zone, etc.)	Total
Areas owned by or leased to Project Company	m^2				

Please provide the following as appropriate:
-Updated land use figures of the Project for both within the site boundary (in the table above) and its surrounding areas (e.g. development of other major industrial facilities, such as Norte Fluminense project, or residential areas in the vicinity).

11. Public consultations / Socio-economic impacts

11-1. Complaints/objections

Please provide the following as appropriate:

-Summary of any complaints, objections or lawsuits, by local communities, NGOs, workers, media, local regulatory bodies, etc, and of actions taken/to be taken.

11-2. Community relations

Please provide the following as appropriate:
-Summary of community relations activities implemented by Project Company over the reporting period.

11-3. Ongoing public consultation

Please provide the status of the following activities that were described in the Public Consultation and Disclosure Plan, April 2002, Page 12.
-Status of the public disclosure of the environmental monitoring reports
-Status of creating a toll free line that can be used by the public to call and clarify any questions or concerns regarding the Macae plant

11-4. Local employment and other economic/social impacts

Please provide the following as appropriate:
-Updated local employment statistics by the Project Company and other local economic/social impacts of the Project realized during the reporting period.

12. Monitoring Parameters for Macaé Resettlement Plan: Vida Nova Agricultural Settlement.

Annual implementation progress reports are to be provided over the 5 year life of this resettlement and income restoration activity.

Annual Reports should provide:

• Review of community participation activities.

•Progress of construction of housing, community infrastructure, and development of plots for agriculture; in subsequent years report on status of infrastructure (including areas under cultivation).

• Implementation date and status of agricultural production program.

•Economic status of households and sustainability / profitability of agricultural development activities (income growth / economic rehabilitation).

• Any significant developments within the community.

• Status of the environmental protection area.

Any remedial or new activities undertaken by Project Company to assure success or to ameliorate the Resettlement Plan.

13. Environmental Compensation Program (Brazilian Federal Law no. 9985, July 18, 2000)

Table 13-1: Implementation Status of Environmental Compensation Program

Project	Project Description (Supplemental EIA Report, April 2002)	Project Budget, Implementation Period	Implementation Status	
			Actual budget disbursed (R$)	Status
Desengano State Park	The goal is to improve the physical infrastructure of the park (e.g. trails, buildings, etc.) and create a management plan to better supervise park operations (e.g. planning, forest fire prevention and environmental education programs, etc.).	R$ 5,000,000 (36 months)		
Macae Canal	A structure will be built along the bank of a Macae River canal branch to promote the environmental recovery and protect a preserved mangrove from urban settlement.	R$ 1,500,000 (12 months)		
Macae River Reforestation	Reforestation of native species along the banks of the Macae River basin.	R$ 1,250,000 (18 months)		
Water Availability Assessment in Macae River Basin	Studies to identify existing users, evaluate future demands, and analyze water quality and quantity resources.	R$ 270,000 (12 months)		

Underground River Resources	Studies to identify the potential availability of underground water in the basin of the Macae River.	R$ 180,000 (12 months)		
Environmental Protection Area Plan	Preparation of a master plan to make the mangroves located along the Macae River estuary an environmentally protected area.	R$ 200,000 (12 months)		
Total		R$ 8,400,000		

Table 13-2: Implementation Status of Environmental Education Program (Project Company's Voluntary Program)

Project	Project Description (Supplemental EIA Report, April 2002)	Project Budget, Implementation Period	Implementation Status	
			Actual budget disbursed (R$)	Status
Environmental Education Program	To raise the level of community awareness of the importance of general conservation (e.g. waste disposal and recycling) and the preservation of nearby mangroves.	R$ 250,000 (12 months)		

14. Environmental Management and Monitoring Program (EMMP)

Please summarize the implementation status of the EMMP as appropriate.

15. Associated Facilities (Transmission Line, Gas Pipeline, etc.)

Please summarize the development status of the associated facilities such as transmission line, gas pipeline, major nearby industrial development projects (e.g. Norte Fluminense), etc. Please also describe the understanding of El Paso Rio Claro Ltda about the environmental / social performance of the CEG's connecting gas pipeline to the Macae Thermal Power Plant.

16. References

15-1. Applicable World Bank Group environmental and social policies and guidelines

•IFC Policy on Environmental Assessment (OP 4.01), dated October 1998;
•IFC Policy on Natural Habitats (OP 4.04), dated November 1998;
•IFC Policy on Pest Management (OP 4.09), dated November 1998;
•World Bank Policy on Cultural Property (OPN 11.03), Dated September 1986;
•World Bank Policy on Involuntary Resettlement (OD 4.30), dated June 1, 1990;
•IFC Policy Statement on Forced Labor and Harmful Child Labor, dated March 1998;
•Thermal Power: Guidelines for New Plants, A chapter in Pollution Prevention and Abatement Handbook, World Bank Group, dated July 1998;
•IFC General Health and Safety Guidelines, dated July 1, 1998;
•IFC Environmental, Health and Safety Guidelines for Polychlorinated Biphenyls (PCBs), dated July 1, 1998;
•IFC Environmental, Health and Safety Guidelines for Electric Power Transmission and Distribution, dated July 1, 1998;
•Oil and Gas Development (Onshore), A chapter in Pollution Prevention and Abatement Handbook, World Bank Group, dated July 1998;

15-2. Relevant EIA documents, etc.

•Macae Merchant Thermal Power Plant, Supplemental Environmental Impact Assessment Report, April 2002;
•Resettlement Plan (Section 2, Part 2)

•Public Consultation and Disclosure Plan (Section 3)
• Macae Merchant Thermal Power Plant, Modification of the Original Project, December 2002;
•Macae Merchant TPP, Environmental Impact Study EIS Volume 1 & 2, October 2000;
•Macae Merchant TPP, Basic Environmental Program (PBA) Volume 1 & 2, March 2001;
•Environmental mitigation, monitoring and management measures (compiled in Chapter 6 “Environmental Management of the Project”)
•Macae Merchant TPP, Environmental Management and Monitoring Plan (EMMP), dated September 2002 (to be updated as appropriate)

15-3.Relevant environmental regulatory authorities

Please list the updated names of national and local environmental regulatory authorities, which are in charge of supervising the Project.