



ELECTRICIDADE  
DE MOÇAMBIQUE, E.P.

ELETRICIDADE DE MOCAMBIQUE, EP  
MAPUTO GAS FIRED COMBINED CYCLE POWER PLANT

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***ENVIRONMENTAL MONITORING REPORT***

Eight Quarter  
(October, November & December)

December, 2018

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## **1. PROJECT BACKGROUND**

The Environmental Management Plan is part of an integrated and continuous effort of Electricidade de Moçambique, EP in the quest for environmental excellence, within the framework of prevention and continuous improvement of its performance at this level, with a view to sustainable development, of the Maputo Gas Fired Combined Cycle Power Plant (CCGT).

The environmental management requirements applicable to CCGT are as follows: ambient air quality (PM<sub>10</sub>), Sulfur and Nitrogen Dioxide (NO<sub>2</sub>), environmental noise, coastal water quality and waste water quality, which are essential in the operation of the power plant. The Environmental policy parameters of the CCGT are listed document that **Environmental Monitoring Plan for Commissioning and Operation (EMoP)**.

The parameters listed as well as the sampling sites are defined within the mentioned document and the results of the surveys are reported in relation to environmental standards according to the EMoP

The parameters listed as well as the sampling sites are defined in the EMoP and the results of the surveys are reported in relation to environmental standards according to the EMoP.

2. QUARTERLY SUMMARY REPORT FORM

3.1. Ambient Air Report

Maputo Gas Fired Combined Cycle Power Plant Environment Monitoring Plan - December Monthly Report										Form: 1
Subject: Ambient Air Report										Location: L4
Project phase: Commissioning and operation										Site Responsible: EDM
Executants: Electricidade de Moçambique E.P										
Item	Unit	Standards For Project	Baseline	Q8/22 <sup>th</sup> Month	23 <sup>th</sup> Month	24 <sup>th</sup> Month	Q9/26 <sup>th</sup> Month	Comments		
NO <sub>2</sub>	ug/m <sup>3</sup>	190(1-hr)	16-Nov 4.7	18-Sep N/A	18-Oct 50,6	18-Nov N/A	18-Dec 47,02	(18-Dec) Result comply with Standard		
SO <sub>2</sub>	ug/m <sup>3</sup>	20(24-hr)	1.4	N/A	2,4	N/A	5,24	Result comply with Standard		
PM <sub>10</sub>	ug/m <sup>3</sup>	50(24-hr)	57.3	N/A	26,2	N/A	Not Measured	Not Measured		
Wind Direction			Not measured	N/A	N/A	N/A	N/A	-		
Wind Velocity	m/s		Not measured	N/A	N/A	N/A	N/A	-		
Temperature	oC		Not measured	N/A	31	N/A	29	-		
Relative humidity	%		Not measured	N/A	78	N/A	76	-		
Executant Representative Sign: <i>Helio Geste Gonsalves</i>										

Maputo Gas Fired Combined Cycle Power Plant Environment Monitoring Plan – December Monthly Report										Form: 1
Subject: Ambient Air Report										Location: L5
Project phase: Commissioning and operation										
Executants: Electricidade de Moçambique E.P										Site Responsible: EDM
Item	Unit	Standards For Project	Baseline	Q8/22 <sup>th</sup> Month	23 <sup>th</sup> Month	24 <sup>th</sup> Month	Q9/26 <sup>th</sup> Month	Comments		
NO <sub>2</sub>	ug/m3	190(1-hr)	16-Nov 4.7	18-Sep N/A	18-Oct 54,3	18-Nov N/A	18-Dec 46,02	(18-Dec) Result comply with Standard		
SO <sub>2</sub>	ug/m3	20(24-hr)	1.4	N/A	3	N/A	5,3	Result comply with Standard		
PM <sub>10</sub>	ug/m3	50(24-hr)	57.3	N/A	27,8	N/A	Not Measured	Not Measured		
Wind Direction			Not measured	N/A	N/A	N/A	N/A	-		
Wind Velocity	m/s		Not measured	N/A	N/A	N/A	N/A	-		
Temperature	oC		Not measured	N/A	N/A	N/A	30	-		
Relative humidity	%		Not measured	N/A	N/A	N/A	76	-		
Executant Representative Sign:										

*Flávio Guedes Gonçalves*

3.2. Noise

Maputo Gas Fired Combined Cycle Power Plant Environment Monitoring Plan - December Monthly Report											
Subject: Noise											
Project phase: Commissioning and operation											
Executants: Electricidade de Moçambique E.P											
Item	Unit	Standards For Project	Baseline				Site Responsible: EDM				Comments
			16-Nov	18-Sep	23 <sup>th</sup> Month	24 <sup>th</sup> Month	Q9/26 <sup>th</sup> Month	20-Dec	Location: L4		
Day time Noise (7:00-22:00)	dBA	70	52.1	68	63	56.6	48.2	Result comply with Standard	(20-Dec)		
Night time Noise (22:00-7:00)	dBA	70	54	51.3	65.8	65.3	52.8	Result comply with Standard			
24h Average Noise	dBA	70	Not measured	Not measured	64.9	63.6	49.3	Result comply with Standard			
Wind Direction	-	-	Not measured	180°	180°	180°	180°	-			
Wind Velocity	m/s	-	Not measured	5.13	1.95	2.3	2.1	-			
Temperature	°C	-	Not measured	27	29	30	29	-			
Relative humidity	%	-	Not measured	65.6	69	71	70	-			
Executant Representative Sign: <i>Helio Geste Gonsalves</i>											

Maputo Gas Fired Combined Cycle Power Plant Environment Monitoring Plan - December Monthly Report										Form: 2
Subject: Noise										
Project phase: Commissioning and operation										
Executants: Electricidade de Moçambique E.P										
Responsible: EDM										
Location: L6										
Site										
Item	Unit	Standards For Project	Baseline	Q8/22th Month	23th Month	24th Month	Q9/26th Month	Comments		
Day time Noise (7:00-22:00)	dBA	70	16-Nov 52.1	18-Sep 65.2	18-Oct 61,9	18-Nov 56.6	20-Dec 54,9	(20-Dec)	Result comply with Standard	
Night time Noise (22:00-7:00)	dBA	70	54	57.8	64,6	65.3	64,8		Result comply with Standard	
24h Average Noise	dBA	70	Not measured	Not measured	62.3	63.6	61		Result comply with Standard	
Wind Direction	-	-	Not measured	180°	180°	180°	180°		-	
Wind Velocity	m/s	-	Not measured	5.13	1.94	2.5	2.6		-	
Temperature	°C	-	Not measured	27	29	30	30		-	
Relative humidity	%	-	Not measured	65.6	73	71	71		-	
Executant Representative Sign: <i>Helio Geste Gonçalves</i>										

2.3. Water quality of wastewater effluent report

Maputo Gas Fired Combined Cycle Power Plant Environment Monitoring Plan – December Monthly Report										Form: 2			
Subject: wastewater effluent										Location: L7			
Project phase: Commissioning and operation													
Executants: Electricidade de Moçambique E.P Site Responsible: EDM													
Item	Unit	Standards for Project	Baseline		Q8/22 <sup>th</sup> Month		23 <sup>th</sup> Month		24 <sup>th</sup> Month		25 <sup>th</sup> Month		Comments
			16-Nov	18-Nov	18-Sep	18-Oct	18-Nov	18-Dec	18-Dec	18-Dec			
Temperature	°C	N/A	N/A	N/A	26.4	26.4	30	29	29	31			
pH	-	6.0-9.0	N/A	N/A	7.28	7.28	7.28	7.10	7.10	7.9			Result comply with project Standard
DO	mg/l	N/A	N/A	N/A	2.0	2.0	Not measured	Not measured	Not measured	Not measured			
BOD	mg/l	N/A	N/A	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured			
COD	mg/l	N/A	N/A	19.0	19.0	19.0	19.0	19.0	19.0	21.3			
TSS	mg/l	50	N/A	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured			
Oil & grease	mg/l	10	N/A	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured			
Total residual chlorine	mg/l	0.2	N/A	0.2	0.2	0.2	0.2	0.2	0.2	0.38			Not Polluted
Chromium(Cr)	mg/l	0.5	N/A	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured			
Cooper(Cu)	mg/l	0.5	N/A	0.1	0.1	0.1	0.1	0.3	0.3	0.03			
Zinc(Zn)	mg/l	1	N/A	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured			
Lead(Pb)	mg/l	0.5	N/A	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured			
Cadmium(Cd)	mg/l	0.1	N/A	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured			
Total Iron(Fe)	mg/l	1	N/A	0.6	0.6	0.69	0.69	0.69	0.69	0.15			Result comply with project Standard
Mercury(Hg)	mg/l	0.005	N/A	Not measured	NA	NA	NA	NA	NA	NA			
Arsenic(As)	mg/l	0.5	N/A	Not measured	NA	NA	NA	NA	NA	NA			
Executants Representative Sign.													

Zulaida Catave



## 2.4. Water quality (Ambient Coastal Water)

Maputo Gas Fired Combined Cycle Power Plant Environment Monitoring Plan - December Monthly Report												
Subject: wastewater effluent										Form: 2		
Project phase: water quality - ambient coastal water										Location: L9		
Executants: Eletricidade de Moçambique E.P Site Responsible: EDM												
Item	Unit	Standards for Project	Baseline		Q8/22 <sup>th</sup> Month		23 <sup>th</sup> Month		24 <sup>th</sup> Month		25 <sup>th</sup> Month	
			16-Nov	18-Nov	18-Sep	18-Oct	18-Nov	18-Dec	18-Nov	18-Dec	18-Nov	18-Dec
Temperature	°C	N/A	Not Measured		N/A		N/A		29		N/A	
pH	-	6.5-8.5	7.9		N/A		N/A		7.6		N/A	
DO	mg/l	6 or more	Not Measured		N/A		N/A		Not Measured		N/A	
BOD5	mg/l	5 or Less	<2		N/A		N/A		Not Measured		N/A	
COD	mg/l	20 or Less	300		N/A		N/A		5458		N/A	Result is not according with project Standard
TSS	mg/l	N/A	Not Measured		N/A		N/A		Not Measured		N/A	
Oil & grease	mg/l	0.5	3		N/A		N/A		Not Measured		N/A	
Total Cr	mg/l	0.05	0.01		N/A		N/A		0.04		N/A	
Chromium	mg/l	0.02	<0.01		N/A		N/A		2.07		N/A	
Cooper(Cu)	mg/l	0.18	<0.01		N/A		N/A		Not Measured		N/A	
Zinc(Zn)	mg/l	0.03	<0.01		N/A		N/A		Not Measured		N/A	
Lead(Pb)	mg/l	0.001	<0.001		N/A		N/A		Not Measured		N/A	
Cd (Cadmium)	mg/l	0.002	<0.0002		N/A		N/A		Not Measured		N/A	
Hg (Mercury)	mg/l	0.05	0.002		N/A		N/A		Not Measured		N/A	
As (Arsenic)	mg/l		0.002		N/A		N/A		Not Measured		N/A	
Executant Representative Sign. <i>Zébalda cakwo</i>												

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## 2.5. Human Drinking Water Quality Report

Subject: Human Drinking Water quality			
Project phase: Commissioning and operation		Location: EDM (Admin. Building)	
Executants: Eletricidade de Moçambique E.P			
		Site Responsible: EDM	
Item	Unit	Standards for Project	Comments
Ph	mg/l	6.5-8.5	Result comply with project Standard
Conductivity	us/cm	Absent	-
Turbidity	NTU	0.3-5	Result comply with project Standard
Odour	-	Odourless	Good
Taste	-	Tasteless	Good
Total dissolved solids	mg/l	1000	Result comply with project Standard
Cooper (Cu)	mg/l	1.0	Result comply with project Standard
Total Iron (Fe)	mg/l	0.3	Result comply with project Standard
Mercury (Hg)	mg/l	0.001	-
Calcium (Ca)	mg/l	50	Result comply with project Standard
Magnesium (Mg)	mg/l	50	Result comply with project Standard
Executant Representative Sign:			

*Silvia Catarina*

### **3. CONCLUSIONS**

The following points conclude this report.

**a. Noise Monitoring**

Environmental noise levels were found to be below the 24-hour standards (70 dB(A)) in all monitoring sites.

**b. Waste water Quality Monitoring**

All waste water parameters tested on holding pond sampling point are within the project guidelines, except COD

**c. Coastal Water Quality monitoring**

All coastal water parameters tested on sea pond sampling point are within the project guidelines.

**d. Human Drinking Water Quality**

All Human Drinking Water Quality parameters tested on Administrative Building point are within the project guidelines.

**Appendix 1- Sampling Locations**



