Air Emissions Management plan

I. Objective

Air emissions consist of any release of solid, aerosol or gaseous substances, radiation or energy into the air, whether the sources are point (e.g. chimney of an incineration plant) or diffuse (e.g. dust from trucks).

In the frame of the project, air emissions will be mostly made of dust particles raised by the road traffic and soil works on site along with exhaust gas and fumes.

A limitation program for atmospheric emissions is therefore implemented in all areas likely to be affected by the construction of the project, in particular near the construction site. This plan allows air limiting emissions and their resulting impacts on the surrounding population and site personnel.

II. General Conditions

A. Scope of Application

Applicable to all sub-contractors.

B. Measures

Sub-contractors (SCs):

- Maintain machines, trucks and any generating sets in accordance with the following emission criteria. **Regular inspection and maintenance** of work engine and equipment (exhausts) are performed (visual observation during site visit).
- Maintain the vehicle fleet and flue gas emitting equipment according to the frequency and method specified by the manufacturer.
- Record maintenance logs of the fleet of vehicles, machinery and equipment in a register.

- The register is made available to ARISE HSE supervisor.

Emission limit criteria for light-duty vehicles

Years of application of the standards	Total distance travelled (or years of use)	Parameters				
		CO (g/km)	CO (%)	NO_x (g/km)	COV (g/km)	Particles (g/km)
Until 2003	< 80 000 km (<5 ans) > 80 000 km (> 5 ans)	2,1 2,6	2 2	0,25 0,37	0,15 0,19	0,12 0,12
2004 and subsequent years	< 80 000 km (<5 ans) > 80 000 km (> 5 ans)	1,1 1,1	1,5 1,5	0,13 0,13	0,08 0,08	0,08

(Source: Decree n°2001-110 of 4 April 2001, Article 3)

Emission limit criteria for heavy-duty vehicles

	Parameters (g/kwh)			
	CO	NO_x	COV	Particles
Until 2010	20,8	6,7	1,7	0,34
2011 and subsequent years	20,8	5,4	1,7	0,13

(Source: Decree n°2001-110 of 4 April 2001, Article 8)

Emission limit criteria for stationary sources

Type of establishment	Parameter	Emission limit criterion
Cement plants (clincker grinding and formulation)	Particles	50 g/T of clincker
Combustion plants using hydrocarbons as fuel	Particles	85 mg/Mj
	NO_x	325 ppm

(Source: Decree n°2001-110 of 4 April 2001, Article 17)

Commented [CB1]: To update according to Ivorian legislation

- Construction and transportation methods do not emit into the atmosphere pollutant loads in excess of the thresholds recommended by the following guidelines.

WHO ambient air quality guidelines

Substance	Average exposure time (measurement period)	Guideline value in µg/m³
Sulfur dioxide (SO_2)	24-hour	20
	10 minutes	500
Nitrogren dioxide (NO_2)	1-year	40
	1-hour	200
Particulate Matter PM_{10}	1-year	20
	24-hour	50
Particulate Matter $PM_{2.5}$	1-year	10
	24-hour	25
Ozone	8-hour daily maximum	100

(Source: Environmental, Health and Safety (EHS) Guidelines, IFC, 2007)

National Ambient air quality guidelines

Polluant	Duration of measurement period	Average value
Ozone (O_3)	Average over 8 hours	0.08 ppm
Carbon monoxide (CO)	Average over 1 hour	40 mg/m³
	Average over 8 hours	10 mg/m³
Sulphur Dioxide (SO2)	Average over 1 hour	1300 µg/m³
	24-hour average	200 µg/m³
	Annual average	80 µg/m³
Suspended particles (<10 microns)	24-hour average	230 µg/m³
	Annual average	50 µg/m³
Nitrogen Dioxide (NO2)	24-hour average	150 µg/m³
	Annual average	100 µg/m³
lead (Pb)	Annual average	2 µg/m³

Source: Decree n°2001-110 of 4 April 2001, Article 3

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- **Minimization of dust emissions** from construction site activities. SCs implement:
    - vehicles speed limited to 30 km/h in all inhabited areas to reduce dust suspension.
    - trucks carrying powdered materials (sand, dust or bulk materials) are covered.
- If the impact on air quality is significant (where it is judged that the level of dust emitted is likely to cause nuisance/risk to surrounding population, biodiversity, increase sediment load in surface waters or in case of multiple complaints), SCs:
    - suspend stripping or soil replacement work in case of strong winds.
    - proceed to a humidification (if required according to the type of soil) of:
        - worksite access roads when they are not paved
        - excavated land stored on the construction site in case of severe drought and high winds (if any) during the dry season when these items are located less than 200 m from a residential area.
    - other dust control measures, e.g., using windbreaks, screens or semi-permeable barriers will be implemented in case of significant impact from dust.
- **Dust monitoring**. SCs perform daily visual inspections of dust emissions from the construction area at sensitive receptors (villages) and other areas of concern (Project area, work site and base camp) during the dry season, to gauge the effectiveness of dust mitigation measures.

Monitoring indicators	Number of soil humidification recorded number of new vehicles purchased Number of complaints about dust emissions Results of air monitoring, when necessary Results of exhaust gas monitoring, when necessary Number of non-compliance observed, registered and treated

Reference documents	-
Registers	Maintenance logs for vehicles and equipment
Procedure approved by	
Emission/last revision date	