

6.0 ENVIRONMENT MONITORING PROGRAMME

6.1 Preamble

Environmental monitoring and audits will be carried out during & after the construction & development phase and during operation phase to check that the environmental management measures are being satisfactorily implemented and that they are delivering the appropriate level of environmental performance.

6.2 Audit

The audit program will include pre-commissioning audits of the facilities focusing on the compliance of equipment and procedures to deliver the specified level of performance to ensure that all environmental requirements are met. Regular operational audits will check:

- Integrity and function of physical systems;
- Compliance with operating procedures and standards;
- Compliance with prescribed relevant environment standards;
- Testing and review of emergency procedures;
- Compliance with maintenance of procedures and records; and
- Competence and training of operatives and field management staff.

Audit results will be reported to management and field staff responsible for the process or equipment in question, where audits reveal non-compliance with requirements, corrective actions will be implemented. These will be prioritized according to the significance of the environmental risks arising. It is recommended that External environment consulting organization as third party should be engaged for audit on quarterly basis.

6.3 Performance Monitoring

Safety features, ambient working environment and Occupational Health and Safety (OHS)-indicators are subjected to regular monitoring and review. The compiled information and any corrective measures taken will be applied in a continuous process to improve the OHS management system (OHSMS) which will be responsible for management of environment, health and safety aspects related to proposed expanded project.

The OHSMS shall include specifications for performance monitoring, evaluation, and improvement of the system as well as for recording and reporting occupational diseases and accidents.

- **OHSMS:** The performance and achievements of the OHSMS responsible for management of overall environment, Health & Safety aspects will be re-assessed on annual basis.
- **Safety Inspection, Testing and Calibration:** KGSL will arrange for regular (annually) third party inspection and testing of all safety features and hazard control measures for plant operation. The inspection will focus on engineering and personal protective features, work procedures, places of work, installations, equipment, and tools used. The inspection must ensure that issued personal protective equipment continues to provide adequate protection and is being worn as required. All instruments installed or used for monitoring and recording of working environment parameters must be regularly tested and calibrated. Records will be kept of all inspections, tests, and calibrations.
- **Monitoring of the Working Environment:** KGSL will document compliance using an appropriate combination of portable and stationary sampling and monitoring instruments for meeting the regulatory requirement as well as for keeping healthy and hygienic environment. The recommended frequency and parameter of environment monitoring for the proposed expansion is as per given in **Table 6.1 & 6.2** during construction and operation phase respectively. However, proposed monitoring programme will be modified as stipulated by MOEF/APPCB:

Table 6.1: Environment Monitoring Plan during Construction

Sn	Component	Parameter	Locations	Frequency
1	Ambient Air	TSPM, RSPM, SO ₂ , NO _x , CO	3-4 locations at the boundary of plant premises	12 hourly samples, twice in a week
2	Waste Water	pH, TDS, SS, BOD ₅ , COD, Oil & grease and Heavy metals	Out put from septic tank/soak pit	Once in a month
3	Noise Level	Hourly Leq	3-4 locations within the plant premises	Continuously during working hour, twice in a week

Table 6.2: Environment Monitoring Plan during Operation

Sn	Component	Parameter	Locations	Frequency
1	Ambient Air	TSPM, RSPM, SO ₂ , NO _x , CO	3-4 locations at the boundary of premises	8 hourly samples, twice in a week
2	Fugitive emission	TSPM, RSPM, SO ₂ , NO _x , CO	8-10 locations at dust processing units	8 hourly samples, twice in a month

Sn	Component	Parameter	Locations	Frequency
3	Stack	PM, SO ₂ , NO _x , CO	All stacks attached to units where combustion take place	Once in three month
		PM	All stacks attached to dust generating units	Once in three month
3	Noise Level	Hourly Leq	At the boundary of the plant premises	Once in two week for 24 hours
4	Waste water	As per GSR 422 (E) for inland surface water	At outlet of STP	Once in three months

- **KGSL** will develop in-house monitoring & testing facility to the possible extent, otherwise, will hire the external agency for the same. Proposed monitoring and testing will be carried out as per the methods recommended by CPCB/APPCB.
- **Surveillance of Worker's Health:** **KGSL** will provide appropriate and relevant health surveillance to workers with special emphasis to the dust prior to first exposure and at regular intervals thereafter.
- **Training:** Training activities for employees and visitors will be adequately monitored and documented (curriculum, duration, and participants). Emergency exercises including drills will be adequately documented. Service providers and contractors must be contractually required to submit the adequate training documentation before start of their assignment.

6.4 Accident and Disease Monitoring

KGSL shall establish procedures and systems for reporting and recording:

- Occupational accidents and diseases; and
- Dangerous occurrences and incidents.

The system will enable workers to report to their immediate supervisor immediately any situation that they believe presents a serious danger to life or health. The system shall further enable and encourage workers to report all:

- Occupational injuries and near misses;
- Suspected cases of occupational disease; and
- Dangerous occurrences and incidents.

KGSL will, with the assistance of a competent person investigate all reported occupational accidents, occupational diseases, dangerous occurrences and incidents together with near misses. The investigation shall as far as possible:

- Establish what happened;
- Determine the cause of what happened; and
- Identify measures necessary to prevent a recurrence.

Occupational accidents and diseases should be at a minimum and will be classified according to **Table 6.3**. Distinction will be made between fatal and non-fatal injuries. The two main categories are divided into three sub-categories according to time of death or duration of the capacity to work. The total number of man-days and hours worked during the reporting period must be stated.

Table 6.3: Occupational Accident and Disease Reporting

a. Fatalities (number)	b. Non-fatal injuries (number)	c. Total time lost non-fatal injuries (days)
a.1 Immediate	b.1 Less than one day	
a.2 Within a month	b.2 Up to 3 days	c.1 Category b.2
a.3 Within a year	b.3 More than 3 days	c.2 Category b.3

**The day on which an incident occurs is not included in b.2 and b.3.*

6.5 Cost of Environment Monitoring

The details of estimated capital and recurring cost of the proposed environmental management plan are given in **Table 6.4**.

Table 6.4: Cost of Environment Management Plan

Sl. No	Particulars	Capital Investment (Rs. in lacs)			Recurring Investment per annum (Rs. in lacs)		
		Existing	Expansion	Total	Existing	Expansion	Total
1	Air Pollution Control	1460.0	3900.0	5360.0	175.0	610.0	785.0
2	Water Pollution Control	175.0	440.0	615.0	53.0	160.0	213.0
3	Noise Pollution Control	45.0	132.0	177.0	5.0	14.0	19.0
4	Environment Monitoring & Management	90.0	350.0	440.0	9.0	20.0	29.0
5	Occupational Health	90.0	175.0	265.0	26.0	45.0	71.0
6	Green Belt	180.0	1050.0	1230.0	53.0	120.0	173.0
Total		2040.0	6047.0	8087.0	321.0	969.0	1290.0

