

7.0 **ENVIRONMENT MONITORING PROGRAMME**

7.1 **Implementation Schedule of Mitigation Measures**

The mitigation measures suggested in **Chapter-4** shall be implemented so as to reduce the impact on environment due to the operations of the proposed project.

7.2 **Environment Monitoring**

The environment monitoring for the proposed plant operations shall be conducted as follows:

- Air quality;
- Water and wastewater quality;
- Noise levels;
- Soil Quality; and
- Greenbelt Development.

A centralized environment monitoring cell will be established for power plant. Monitoring of important and crucial environment parameters is of immense importance to assess the status of environment during operation of power plant. With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environment conditions due to operation of the cement plant and suitable mitigatory steps could be taken in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring. The following routine monitoring program will be implemented under the post-project monitoring in the proposed plant. The monitoring program for implementation is given below.

- ***Air Pollution and Meteorological Aspects***

Both ambient air quality and meteorology will be monitored. The ambient air will be monitored twice in a week in line with the guidelines of Central Pollution Control Board and SPCB.

Meteorological parameters like wind speed, wind direction, temperature, relative humidity and rainfall will be recorded continuously at CPP.

- ***Water and Wastewater Quality***

The storm water will be analyzed in the rainy season. The ground and surface water quality will be monitored in every season at selected locations. The water depths will be monitored in the wells of surrounding villages in every season.

- ***Noise Levels***

Noise levels in the work zone environment and ambient will be monitored regularly. The frequency of noise monitoring will be once in a month in the work zone. The ambient noise levels in the surrounding villages will be monitored once in six months.

• **Soil Sampling**

Soil samples will be tested before plantation/vegetation of the area. The environment monitoring cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the regulatory agencies.

The environment monitoring program to be implemented is given in **Table-7.1**.

**TABLE-7.1
MONITORING SCHEDULE FOR ENVIRONMENT PARAMETERS**

Sr. No.	Particulars	Monitoring Frequency	Duration of Sampling	Important Monitoring Parameters
1	Air Pollution and Meteorology			
	Air Quality			
	A Ambient Air Quality Monitoring			
	Selected 4 locations in and around plant specified by SPCB	Twice in a week	24 hr continuously	PM, SO ₂ , NO _x and CO
	B Stack gas analysis in all major stacks	Once in a month	One time	Specified as per State pollution control Board
	C Fugitive dust sampling at work zone as per CPCB or SPCB guidelines	Once in three months	24 hr continuously	PM
	Meteorology			
	a Meteorological data to be monitored at CPP	Daily	Continuous Monitoring	Wind speed, direction, temperature, relative humidity and rainfall.
2	Water and Wastewater Quality			
	A Industrial/Domestic			
	1 Sewage treatment plant	Daily	24 hr composite	As per CPCB/ SPCB norms
	2 Effluents (if any) during Monsoon	Once in a month	24 hr composite	As per CPCB/ SPCB norms
	B Water quality in the study area			
	1) Ground Water quality	Half yearly	Grab	As per the parameters specified under IS:10500
	2) Surface Water	Half yearly	Grab	Parameters specified under IS:10500
3	Industrial Noise Levels			
	1) Major noise generating sources	Every fortnight	24 hr continuous with 1 hr interval	Noise level in dB(A)
	2) Near the turbine	Fortnight	24 hr continuous with 1 hr interval	Noise level in dB(A)
	3) Along the road for transportation noise	Fortnight	24 hr continuous with 1 hr interval	Noise level in dB(A)
	Ambient Noise Levels			
	4 Locations around CPP	Fortnight	24 hr continuous	Noise levels in dB(A)

Sr. No.	Particulars	Monitoring Frequency	Duration of Sampling	Important Monitoring Parameters
			with one hr interval	
4.	Soil Characteristics			
	1. Selected 10 locations in core and buffer zone in nearby villages	Yearly	One Grab sample	Colour, textural class, grain size, distribution, pH, Electrical Conductivity, Bulk Density, Porosity, Infiltration rate, Moisture retention capacity, Wilting Co-efficient, Organic matter Na, N, K, PO ₄ , SO ₄ , SAR, Base Exchange Capacity, Pb, Cu, Zn, Cd, Fe.

Source: Vimta Labs Limited

7.3 Monitoring Methods and Data Analysis

All environment monitoring and relevant operational data will be stored in a relational database. Regular data extracts and interpretive reports will be sent to the regulator.

7.3.1 Air Quality Monitoring and Data Analysis

The concentration of air borne pollutants in the workspace / work zone environment will be monitored periodically. If concentrations higher than threshold limit values are observed, the source of fugitive emissions will be identified and necessary measures taken. If the levels are high suitable measures as detailed in EMP shall be initiated.

The ground level concentrations of PM, SO₂, NO_x and CO in the ambient air will be monitored at regular intervals. Any abnormal rise will be investigated to identify the causes, and appropriate action will be initiated. Greenbelt shall be developed for minimising dust propagation. The ambient air quality data should be transferred and processed in a centralised computer facility equipped with required software. Trend and statistical analysis should be done.

7.3.2 Water and Wastewater Quality Monitoring and Data Analysis

Methods prescribed in "Standard Methods for Examination of Water and Wastewater" prepared and published jointly by American Public Health Association (APHA), American Water Works Association (AWWA) and Water Pollution Control Federation (WPCF); Manual on Water and Wastewater Analysis published by NEERI, Nagpur are recommended.

7.4 Monitoring Equipment and Consumables

A well-equipped laboratory with consumable items will be provided for monitoring of environment parameters. Alternatively, monitoring can be outsourced to a recognized laboratory.

a) Air Quality and Meteorology

Following equipment and consumable items will be made available with the environment cell to meet the monitoring frequency and to implement the monitoring program.

- Respirable Dust Samplers
- Personal sampler
- CO Monitor
- Weather station (automatic recording)
- Spectrophotometer (visible range)
- Single pan balance
- Relevant chemicals as per IS:5182
- Chemical/Glass ware

b) Water and Waste Water Quality

The sampling should be done in jerry cans as per the standard procedures laid down by IS: 2488. Following equipment are recommended to be available with the environment cell:

- BOD incubator;
- Refrigerator;
- Oven;
- Stop watch;
- Thermometer;
- pH meter;
- Distilled water plant;
- Spectrophotometer; and
- Relevant chemicals and Glasswares.

c) Noise Levels

The environment cell shall have sound level meter to record noise levels in different scales like A, B and C with slow and fast response options and vibration meter. Further, any recognized agency can also be engaged for carrying out the above stated monitoring works.

7.5 Occupational Health and Safety

Occupational health and safety is very closely related to productivity and good employer-employee relationship. The main factors of occupational health in plant are fugitive dust and noise. Occupational Health Survey of the employees will be carried out at regular intervals.

These include:

- Effective de-dusting system;
- Provision of rest shelters for workers with amenities like drinking water, fans, toilets etc.;
- Provision of personal protection devices to the workers;
- Rotation of workers exposed to noise premises; and
- First-aid facilities in the plant.

7.6 Environmental Management Cell

The proposed plant will be supervised and controlled by a General Manager supported by adequate team of technically and statutorily qualified personnel

apart from the operating staff of skilled, semi skilled, unskilled and other categories.

Environment Management will be the responsibility of the Environment Management cell headed by the Manager (Environment) and comprising of Environmental Engineer, safety officer, chemists, etc. The Manager (Environment) will report to the Plant General Manager.

The Manager-Environment will be responsible for Environment management activities in the power plant. To facilitate effective environment management, DCW will create a department consisting of officers from various disciplines to co-ordinate the activities concerned with the management and implementation of the environmental control measures.

Basically, this department will supervise the monitoring of environmental pollution levels viz. ambient air quality, water and effluent quality, noise level either departmentally or by appointing external agencies wherever necessary.

In case the monitored results of environmental pollution found to exceed the allowable limits, the Environmental Management Cell will suggest remedial action and get these suggestions implemented through the concerned authorities.

The Environmental Management Cell will also co-ordinate all the related activities such as collection of statistics of health of workers and population of the region, afforestation and green belt development.

The organization chart is shown in **Figure-7.1**.

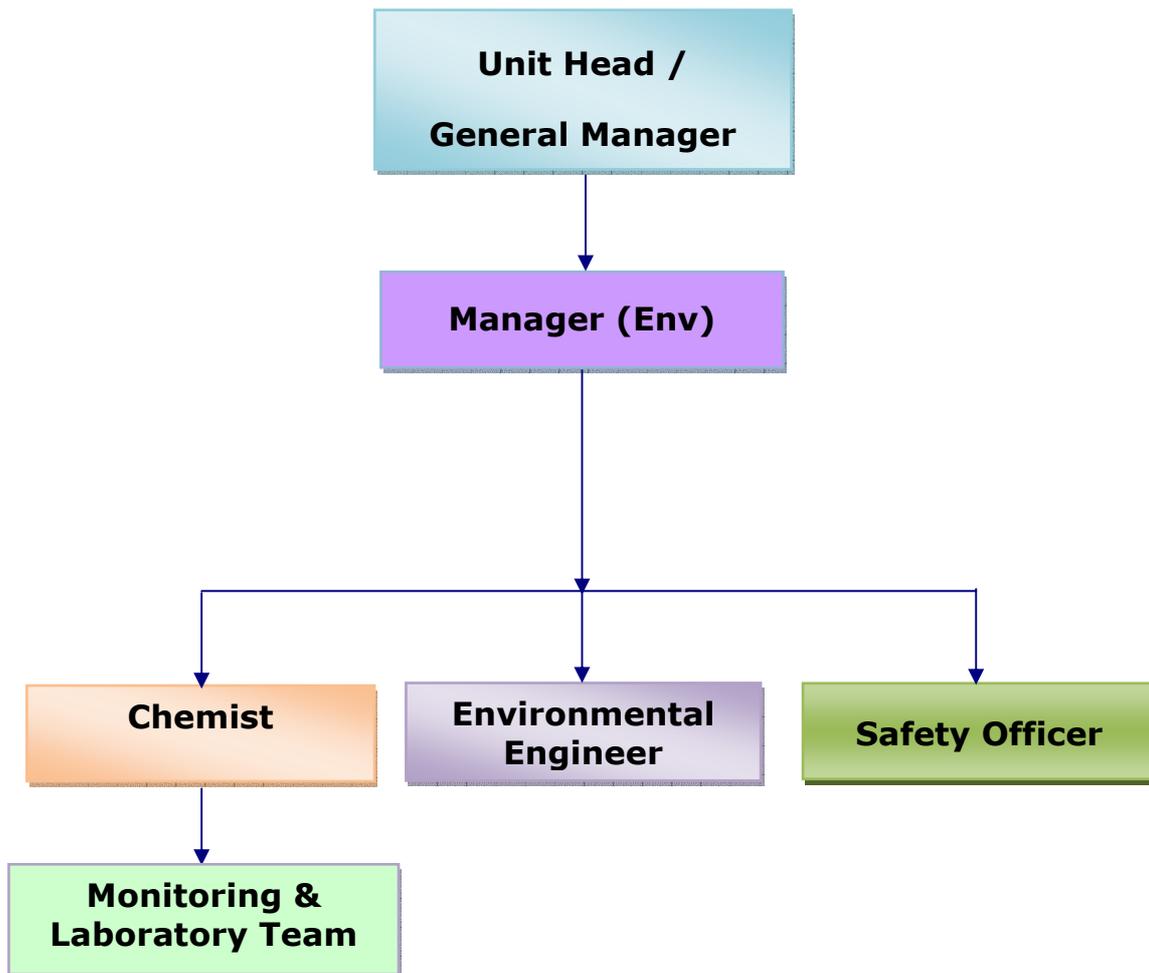


FIGURE-7.1
ORGANISATION CHART