

CHAPTER – 5**ENVIRONMENTAL MANAGEMENT PLAN****5.1 INTRODUCTION**

Environment Management is basically resource management and environment planning similar to development planning. Company shall adopt a comprehensive Environmental Management Plan (EMP) which will cover several environmental protection measures, not only for abatement of environmental pollution resulting from the project, but also for the improvement in the ambient environment. The various components of the EMP are outlined in subsequent sections.

5.2 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PLAN

The main objectives in formulating the Environmental Management Plan are,

- To treat all the pollutants i.e. effluent, air emission & waste, which contribute to the degradation of environment with appropriate technology.
- To comply with all the regulations stipulated by central/state pollution control boards related to air emission and liquid effluents discharge as per Air & water pollution control laws.
- To encourage, support and conduct development work for the purpose of achieving environmental standards and to improve methods of environmental management.
- To promote further forestation in the surrounding areas of the plant.
- To create good working conditions (devoid of air & noise pollution) for employees.
- To reduce fire and accident hazards.
- Perspective budgeting and allocation of funds for environmental management expenditure.
- Dissemination of technological solution on commercial basis to interested parties.
- Continuous development and search for innovative technologies for better environment.
- To adopt cleaner production technology.
- To comply Corporate Responsibility for Environmental Protection (CREP).
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5.3 DETAILS OF ENVIRONMENTAL MANAGEMENT PLAN**5.3.1 CONSTRUCTION AND COMMISSIONING PHASE****5.3.1.1 AIR ENVIRONMENT**

Construction phase will be for a short period and hence the impacts will also be for a short and temporary period.

During construction activities, mainly emission of dust and gases from movement of vehicles and construction activity is expected. However, following measures will be taken to reduce / contain such emissions

Preparation of paved internal movement roads will be taken up at the initial stage of civil construction work.

Watering of loose top soil to prevent re-suspension of dust into ambient air due to movement of vehicles etc.

Separate civil construction material storage yard will be created within the site and it will be enclosed.

Cement bags will be separately stored under cover in bales. Sand will be stacked under tarpaulin cover. Possibility of raising green belt along with construction activity will also be explored.

Transport vehicles and construction equipments / machineries will be properly maintained to reduce air emissions.

Vehicles and equipments will be periodically checked for pollutant emissions against stipulated norms.

Idle running of vehicles will be minimized during material loading / unloading operations.

All construction workers will be provided appropriate PPEs like dust mask, ear plug, helmet, safety belt etc. and made to wear them during working hours.

5.3.1.2 WATER ENVIRONMENT

Maximum water requirement for construction purpose is estimated to be approximately 10 cu. mt. per day and water requirement for domestic purpose of construction work force is estimated to be approximately 3 cu. mt. per day. Thus, total water requirement during construction period will be approximately 13 cu. mt. per day. It is proposed to supply this quantity of water to site everyday through tanker of private water supplier or bore well. Water quantity being small, no major impact on existing water resources of the study area is envisaged. Further, there will be no housing facility at site for construction workers and hence a major source of impact on water environment will be avoided. Proper and sufficient sanitary facility will be provided to construction workers to maintain hygienic conditions at site. Storm water drain compatible with the local hydrological pattern of the area will be provided to carry - off any run - off or storm water from the premises and this water will be harvested through ground water recharge or storage. Care will be taken during construction work not to create any obstruction / dips in the topography which can lead to accumulation of water within premises leading to undesirable consequences like health and hygiene problems etc.

5.3.1.3 SOLID WASTE

Main solid waste generation during construction phase will be construction debris like rubble, brick bats, debris, steel scrap, wooden scrap, sand, gravel etc. However, these materials are inert in nature and will not result into leaching of any substance or constituent. These materials will be properly sorted and will be used within premises for filling of low lying areas. Wooden scrap, steel scrap will be given to scrap dealers. On completion of civil work, all debris etc. will be completely removed from site to avoid any incompatibility with future use.

5.3.1.4 NOISE ENVIRONMENT

Following measures are proposed during construction period to mitigate adverse impacts: Construction machinery and vehicles will undergo periodic maintenance to keep them in good working condition. All machineries to be used for construction purpose will be of highest standard of reputed make and compliance of noise pollution control norms by these equipments will be emphasized by company. Acoustic laggings and silencers will be used in equipments wherever possible. Feasibility of putting up acoustic enclosure / temporary barrier around areas with high noise levels will also be explored. All construction workers working in high noise areas will be provided appropriate PPEs like ear muffs and made to wear them during working hours. Possibility of raising green belt alongwith construction activity will also be explored so as to serve as a noise barrier.

5.3.1.5 LAND ENVIRONMENT

Following steps are proposed to take care of impact of construction activity on project land area : On completion of civil work, all debris etc. will be completely removed from site to avoid any incompatibility with future use. Other material like paints, diesel etc. will be properly stored and handled to prevent any spillage on land. All the wastes will be stored at a designated site within the premises to prevent scattered discharge on land.

5.3.1.6 ECOLOGY

Project site is almost flat land with few shrubs and herbs. Thus, no major tree cutting exercise will be there and no major impact on ecology is anticipated. However, possibility of raising of green - belt along with construction activity will be explored so that greening of area can be started at the beginning of project.

5.3.1.7 SOCIO-ECONOMIC

As there will be no temporary housing colony for construction workers, no socio - economic impact due to the same is envisaged. Over - all socio - economic effect of construction phase will be positive due to direct and indirect employment opportunity for the local population.

5.3.2 OPERATION PHASE

Operation phase of any industry being longer in duration and because of its' potential to create continuous impacts, is much more important from the environmental impact point of view and a comprehensive and effective EMP has to be prepared and implemented to safe-guard environmental concerns during operation phase of any unit.

5.3.2.1 AIR ENVIRONMENT

Following measures are proposed to mitigate negative impact of operation phase of the project on the surrounding air environment:

All transfer points will have bag filter attached to them to control and capture dust emission.

Height of all the stacks will be as per statutory requirement. All the stacks will have stack monitoring facility (SMF) consisting of sampling port-hole, platform and access ladder.

Adequate spares of critical components of dust collection systems will be kept to ensure trouble – free operations and continuous compliance to emission norms.

A comprehensive plan for fugitive emission control based on CPCB guidelines is prepared and its details are given following section.

Possibility of use of vehicles using cleaner fuel like CNG will be explored and if found feasible will be implemented on a large scale.

Transport vehicles will be properly maintained to reduce air emissions.

Vehicles will be periodically checked for pollutant emissions against stipulated norms. Idle running of vehicles will be minimized during material loading/ unloading operations.

Action plan to control secondary fugitive emissions as per CPCB guidelines:

A) Unloading section :

Enclosure (of flexible material) will be provided towards unloading side upto suitable height.

Bag filter will be provided to effectively capture dust emission.

(B) Material Handling Section And Transfer Points

All transfer point locations will be fully enclosed but will have access doors. Doors will be kept closed during operation.

All transfer points will have bag filters.

(C) Storage Of Limestone, Clay, Coke Breeze, Clinker, Cement, Gypsum And Fly Ash

Lime stone will be stored in lime stone storage yard covered by green belt.

Clay, Coke breeze, Gypsum, fly ash, etc. storage will be done under covered shed and side walls will be provided on minimum two sides upto roof level.

Clinker and fly – ash will be stored in concrete silos.

Raw Mill & Cement will be stored in silo equipped with bag filters

(D) Cement Packing Section

Packing machines will be provided dust extraction system in the form of bag filters.

Adequate ventilation will be provided in packing hall to provide dust free work environment.

Spilled cement from the packing machine will be collected properly and sent for recycling.

Arrangement for vacuum sweeping will also be provided.

(E) Roads

All internal roads will be of concrete and will be well maintained. Repairing work required, if any, will be carried – out immediately.

Water sprinkling will be done regularly along the road to control fugitive emission.

Speed limit inside the plant premises will be fixed to prevent dust emissions.

Other Measures:

Company will also designate Environment Manager, who will look after fugitive dust emission

control including emergency situations. He will be adequately trained to handle the responsibility of control of fugitive emissions.

All personnel working on fugitive emission control systems will be given regular training on operation and maintenance of the system.

A proper record and documentation of fugitive dust control system will be kept.

All other guidelines of CPCB too will be complied.

5.3.2.2 WATER ENVIRONMENT

Total water requirement for operation phase of the proposed project is estimated at 130 m³ per day and is proposed to be met through own bore-well. To compensate and mitigate impact on ground water availability in the area due to continuous withdrawal of ground water by the project to the tune, a comprehensive rain water recharge scheme has been developed and its details are given in following section.

Proper and sufficient sanitary facility will be provided to construction workers to maintain hygienic conditions at site.

The sewage is treated in a common sewage treatment plant. While the purified water will be reused for the cement manufacturing process, the sewage sludge, which is an excellent fertilizer, shall be set out in the areas where reforestation is anticipated.

6.3.2.2.1 ACTION PLAN FOR RAINWATER HARVESTING

Rain Water Harvesting is a way to capture the rain water when it rains, store that water above ground or charge the underground and use it later.

Rainwater Harvesting System:

Rooftop rainwater harvesting: Rooftop rainwater from the admin area, store area and plant area is flown down to the ground and then taken to storm water drains. The storm water drains are intercepted at strategic locations and rainwater is diverted into recharge wells. The recharge wells are provided with recharge boresto facilitate the recharge. Layers of filtering material like boulders, pebbles and coarse sand inside therecharge well ensure efficient filtration. In addition to ground water recharge company will store rain waterfor its use.

5.3.2.3 NOISE ENVIRONMENT

Following precautionary measures will be adopted to control the noise level :

Roof of buildings will be constructed of reinforced concrete or of lightweight concrete

Walls and ceilings of building will be lined with sound absorbing materials, wherever required Sheet metal casting and housing will be insulated with sound absorbing materials

Noise generating sources and their platforms will be maintained properly to minimize noise vibrations generated by them

Personnel working near the noisy machines in different plant locations, will be provided with well designed ear muffs / plugs (effective noise reduction 10-15 dBA)

Cement mill premises will have proper ventilation.

Green belt will be developed to act as a noise barrier.

Noise barriers/ shields in the form of walls, beams will be provided around the units wherever found feasible

Training to personnel will be imparted to generate awareness about effects of noise and importance of using PPEs .

5.3.2.3 LAND ENVIRONMENT

All the solid wastes will be stored separately in a “Solid Waste Storage Area” within the factory premises. It will have non -percolating R.C.C. floor and covered roof. The storage area will have proper illumination and ventilation and equipped with fire extinguisher device wherever required. A sign - board will be put out-side the storage area marked “Solid Waste Storage Area” and “Danger”. Non - hazardous dried bio-sludge from septic tank will be rich in nutrients and hence will be used as fertilizer and nutrient within premises for gardening. Hazardous waste i.e. used lubricating oil will be given to CPCB registered recycler / re-processor of oil.

5.3.2.5 BIOLOGICAL ENVIRONMENT

5.3.2.5.1 GREEN BELT DEVELOPMENT PLAN

Tree plantation is one of the effective remedial measures to control the Air pollution and noise pollution. It also causes aesthetics and climatologically improvement of area as well as sustains and supports the biosphere. It is an established fact that trees and vegetation acts as a vast natural sink for the gaseous as well as particulate air pollutants due to enormous surface area of leaves. It also helps to attenuate the ambient noise level. Plantation around the pollution sources control the air pollution by filtering the air particulate and interacting with gaseous pollutant before it reaches to the ground. Tree plantation also acts as buffer and absorber against accidental release of pollutants.

About 6,622 sq.m. i.e. around 33 % of total plant area shall be developed as green belt at plant boundary, road side, around offices & buildings and Stretch of open land.

The selection of tree species suitable for plantation at the industry shall be governed by guiding factors as stated below

- The trees should be tolerant to air pollutants present in the area
- The trees should be able to grow and thrive on soil of the area, be evergreen, inhabitant, having minimum of leaf fall.
- The trees should be tall in peripheral curtain plantation and with large and spreading canopy in primary and secondary attenuation zone.
- The trees should possess extensive foliar area to provide maximum impinging surface for continued efficient adsorption and absorption of pollutants
- The trees should be fast growing and indigenous and should maintain ecological, land and hydrological balance of the region.
- It is also recommended to plant few trees, which are sensitive to air pollution, as air pollution indicator
- It is also recommended to carry out extensive plantation within premises.
- Some portion of Rooftops/terraces area of the building will be covered with plantation.

- Keeping in view the climatic conditions, status of soils and vegetation types in and around the project area the species shall be selected for proposed green belt development. A list of plant species recommended for greenbelt development as given in following table-5.1.

5.3.2.6 OCCUPATIONAL HEALTH AND SAFETY PROGRAM FOR THE PROJECT

Health hazards associated with the occupation are called occupational hazards. In Cement industry the major sources of emission are:

1. Crusher Section: Total Dust or Suspended Particulate Matter.
2. Raw Mill Section: Total Dust or Suspended Particulate Matter.
3. Kiln Section: Suspended Particulate Matter, SO₂, NO_x.
4. Cement Grinding Unit: Total Dust or Suspended Particulate Matter.

All precautions would be taken to avoid foreseeable accident like spillage, fire hazards and to minimize the effect of any such accident and to combat the emergency at site level in case of emergency. Some of the preventive safety measures to minimize the risk of accident with respect to Technical Safety, Organizational Safety and Personal Safety are listed below:

Regular inspection and maintenance of pollution control systems.

All measures related to safety such as safety appliances, training, safety awards, posters, slogans will be undertaken.

Adequate facilities for drinking water and toilets will be provided to the employees.

The fire and safety equipment will be properly utilized and maintained regularly.

The health of the workers will be regularly checked by a well qualified doctor and proper records will be kept for each worker.

The factory will take all reasonably practicable measures to minimize the risk of such accident in compliance with the legal obligation under the relevant safety.

All building plans and installations are as per relevant acts and duly approved by competent government authorities.

Safety features such as fire extinguisher and suitable Personal Protective Equipment (PPE) shall be provided. Regular operations and testing of fire extinguishers shall be carried out.

Periodic inspection and testing of pressure vessels, equipment, machineries and equipment handling hazardous substances.

Training of workers and Staff for fire fighting, work permit system, first aid, safe handling of hazardous chemicals and integrating safety, in all activities.

Accident / Incident reporting system and information of employees about the same for better awareness.

Suitable notices / boards displayed at several locations indicating appropriate hazards warning as well as DOs and DON'T for ensuring operational and personal Safety for information of workers / staff and visitors.

For the safety of the workers, personal protective equipments like hand gloves, helmets, safety shoes, goggles, aprons etc. & Ear protecting devices like earplugs/earmuffs will be provided. Nose mask will be provided at places, where there is possibility of dust generation.

5.3.2.6.1 OCCUPATIONAL HEALTH SURVEILLANCE OF THE WORKER

M/s. GMG Cement Industries shall carry out the following Health surveillance

- i) Pre - employment medical check up at the time of employment.
- ii) Periodical medical check up shall be done for all employees as:
 1. <30 Once in five years

2. 31-40 Once in four years
 3. 41-50 Once in two years
 4. Above >50 years once every year
- iii) First aid training shall be given to the employees.
 - iv) Monitoring of occupational hazards like noise, Heat, chemical (Raw materials & Product) exposure shall be carried out at frequent intervals, the records of which shall be documented.
 - v) Evaluation of health of workers viz. chest x ray, Audiometry, Spirometry Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre-employment and periodical examinations shall be carried out.

5.3.2.6.2 GENERAL CONSIDERATIONS

For good house keeping of the proposed project, following measures will be planned:

Maintaining cleanliness of roads to prevent accumulation of dust and waste material.

Inculcating positive attitude among employees for good house -keeping.

Maintaining hygienic conditions in canteens, near drinking water source and toilets.

5.4 ENVIRONMENTAL MANAGEMENT CELL (TEAM)

In addition to preparing an EMP, it is also necessary to have a permanent organizational set up to ensure its effective implementation. Hence, Company will create a team consisting of officers from various departments to co-ordinate the activities concerned with management and implementation of the environmental control measures. This team will undertake the activity of monitoring the stack emissions, ambient air quality, noise level etc. either departmentally or by appointing external agencies wherever necessary. Regular monitoring of environmental parameters will be carried - out to find out any deterioration in environmental quality and also to take corrective steps, if required, through respective internal departments. The Environmental Management Cell will also collect data about health of workers, green belt development\ etc. Organogram of the Environmental Management Cell is presented in figure-5.1.

FIGURE - 5.1 AN ORGANOGRAM OF ENVIRONMENT MANAGEMENT CELL

General Manager

Chief Manager

Executive

Plant Supervisor

Chemist

Operators

The cell will also be responsible for monitoring of the plant safety and safety related systems which include:

Checking of safety related operating conditions.

Visual inspection of safety equipments.

Preparation of a maintenance plan and documentation of maintenance work specifying different maintenance intervals and the type of work to be performed.

Other responsibilities of the cell will include :

Conduct and submit annual Environmental Audit. A SPCB registered agency will be retained to generate the data in respect of air, water, noise, soil and meteorological data and prepare the Environmental Audit report. This report will be submitted to the SPCB every year before 30 September. Timely renewal of Consolidated Consents & Authorization (CC & A) will also be taken care of.

Submitting environmental monitoring report to SPCB. Data monitored by the cell will be submitted to the Board regularly and as per the requirement of SPCB. The cell will also take mitigative or corrective measures as required or suggested by the Board.

Keeping the management updated on regular basis about the conclusions / results of monitoring activities and proposes measures to improve environment preservation and protection.

Conducting regular safety drills and training programs to educate employees on safety practices. A qualified and experienced safety officer will be responsible for the identification of the hazardous conditions and unsafe acts of workers and advise on corrective actions, organise training programs and provide professional expert advice on various issues related to occupational safety and health.

Conducting safety and health audits to ensure that recommended safety and health measures are followed.

5.5 MONITORING OF ENVIRONMENT

A regular monitoring of environmental parameters like air, water, noise and soil as well as performance of pollution control facilities and safety measures in the plant are important for proper environmental management of any project. Therefore, the environment and safety cell will handle monitoring of air and water pollutants as well as the solid wastes generation as per the requirements of State Pollution Control Board and Central Pollution Control Board. Proposed monitoring schedule for environmental parameters is given in following table-5.2.

ADVANTAGES OF MONITORING:

Monitoring of various parameters will be carried out regularly to:

find out pollution level inside the plant and in nearby area

compile pollution related data for remedial measures

find out efficiency level of pollution control measures adopted

TABLE - 5.1 ENVIRONMENTAL MONITORING PLAN

SR. NO.	ATTRIBUTE PARAMETERS	FREQUENCY OF	MONITORING
1.	Meteorology	Wind speed & direction, temperature, humidity, rainfall etc.	Weekly
2.	Ambient air quality	PM 10, PM2.5, SO2 and NOx	Monthly
3.	Stack Monitoring	SPM, SO and NOx	Weekly
4.	Fugitive emission monitoring	PM10, PM, Dust	Weekly
5.	Water quality	Physical, Chemical and Bacteriological parameters.	Twice in year
6.	Noise levels	Noise levels in dB(A)	Weekly
7.	Soil	Parameters related to agricultural and afforestation potential	Once in year

5.6 BUDGETORY PROVISIONS FOR EMP

Adequate budgetary provisions have been made by the management for execution of environmental management plans. Total capital and recurring cost per annum earmarked 41.30 Lacs and 6.19 Lacs respectively for pollution control / monitoring equipment; operation and maintenance of pollution control facilities, for greenbelt development and maintenance.

TABLE - 5.2 COST OF ENVIRONMENTAL PROTECTION MEASURES (RS. IN LAKHS)

SR. NO.	ITEM	RS. IN LAKHS
		CAPITAL EXPENDITURE:
1.	Air Pollution control equipment	29.50
2.	Sewage Treatment for Domestic waste water	3.54
3.	Emission Monitoring equipments	2.36
4.	Green belt development	3.54
5.	Establishment of Environment cell and Environmental Monitoring	2.36
	Total Capital Expenditure	41.30
		RECURRING EXPENDITURE PER ANNUM:
6.	Recurring expenditure on environmental management cell and on pollution control systems	6.19