

CHAPTER–V

ENVIRONMENTAL MONITORING PROGRAMME

5.1 Introduction

Regular monitoring of environmental parameters is of immense importance to assess the status of environment during project operation. With the knowledge of baseline conditions, the monitoring programme will serve as an indicator for any deterioration in environmental conditions due to operation of the project, to enable taking up suitable mitigatory steps 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.

Usually, as in the case of the study, an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by the natural or human activities. Therefore, regular monitoring programme of the environmental parameters is essential to take into account the changes in the environmental quality.

Post Project Monitoring is an essential part to check the impact of any project activity. Hence monitoring of various environmental parameters will be carried out on a regular basis to ascertain the following:

- State of Pollution within the project site and in its vicinity.
- Generate data for predictive or corrective purpose in respect of pollution.
- Examine the efficacy of pollution control system adopted at the site.
- To assess environmental impacts.

Monitoring will be carried out at the site as per the norms of CPCB. Environmental Monitoring Programme will be conducted for various environmental components as per the conditions stipulated in Environmental Clearance Letter to be issued by MOEF. Six monthly compliance report will be submitted every year to Regional office, MoEF, Chandigarh on 1st of June & 1st of December.

5.2 Formation of EMC (Environmental Management Cell)

In order to maintain the environmental quality within the standards, regular monitoring of various environmental components is necessary. A full-fledged environmental management cell (EMC) will be established for environmental monitoring and control. The EMC team will take care of pollution monitoring aspects and implementation of control measures.

5.2.1 Responsibilities of EMC

The responsibilities of the EMC include the following:

- Environmental monitoring of the surrounding area.
- Commissioning of pollution control equipment.

- Specification and regulation of maintenance schedules for pollution control equipment.
- Ensuring that standards of housekeeping in the mine are maintained.
- Developing the green belt.
- Ensuring Water use is minimized.
- Carrying out the Environmental Management Plan.

5.3 Measurement Methodologies

5.3.1 Instrument to be used

The following instruments will be used for data collection work in the monitoring schedule:

1. Respirable dust sampler.
2. Fine volume sampler
3. Water level indicator
4. Sound level meter model

5.3.2 Monitoring Programme

The post project monitoring will include details of any major/ minor impact in the core zone and area within buffer zone in respect of the following parameters: -

- Micro - meteorological data
- Ambient air quality monitoring
- Noise level monitoring
- Water quality & level
- Soil monitoring

5.4 Environmental Monitoring and Reporting Procedure

Monitoring shall confirm that commitments are being met. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges, emissions and wastes, for measurement against corporate or statutory standards, consent limits or targets. It may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

The preventive approach to management may also require monitoring of process inputs, for example, type and method used, resource consumption, equipment and pollution control performance etc.

The key aims of monitoring are, first, to ensure that results/conditions are as forecast during the planning stage, and where they are not, to pinpoint the cause and implement action to remedy the situation. A second objective is to verify the evaluations made during the planning process, in particular with risk and impact assessments and standard & target setting and to measure operational and process efficiency.

Monitoring will also be required to meet compliance with statutory and corporate requirements. Finally, monitoring results provide the basis for auditing.

5.4.1 Objectives of Monitoring

The objectives of monitoring are to:

- Verify effectiveness of planning decisions;
- Measure effectiveness of operational procedures;
- Conform statutory and corporate compliance; and
- Identify unexpected changes.

5.5 Environmental Monitoring

The monitoring program can serve as an indicator for any deterioration in environmental conditions due to operation of the mine, and helps in planning suitable mitigatory steps that 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 as per CPCB guidelines.

During operation of mine, dust is the main pollutant which arises from different mining and stone crusher activities

The following attributes which merit regular monitoring based on the environmental setting and nature of project activities are listed below:

- Source emissions and ambient air quality
- Groundwater quality
- Soil quality
- Noise levels (occupationnel exposures and ambient noise levels);and
- Ecological preservation and afforestation.

The following routine monitoring programme as detailed in **Table-5.1** shall be implemented at site. Besides to this monitoring, the compliances to all environmental clearance conditions and regular permits from SPCB/MoEF shall be monitored and reported periodically.

The monitoring of liked project i.e. Stone Crusher shall be carried out as per the norms of State Pollution Control Board to meet the prescribed standards under EPA. The unit shall be required to install the pollution control equipment as per consent conditions.

TABLE-5.1

ENVIRONMENTAL MONITORING DURING OPERATIONAL PHASE

| Sr. No. | Potential Impact | Action to be Followed | Parameters for Monitoring | Frequency of Monitoring | Location |
|---------|----------------------------------|--|---|---------------------------------|-------------------------------------|
| 1 | Air Emissions | Ambient air quality within the premises of the proposed unit and nearby habitations to be monitored. | PM10,SO ₂ , NO _x and CO. | Half Yearly | Near Mine office, Near Haulage road |
| | | Exhaust from vehicles to be minimized by use of fuel efficient vehicles and well maintained vehicles having PUC certificate. | Vehicle logs to be maintained | Regularly | Main gate |
| | | Vehicle trips to be minimized to the extent possible | Vehicle logs | Daily records | Main gate |
| 2 | Noise | Noise generated from various mining operations and stone crusher | Spot Noise Level recording; Leq(night), Leq(day), Leq(dn) | Periodic during operation phase | Main gate, working zone |
| 3 | Wastewater Discharge | No untreated discharge to be made to surface water, groundwater or soil. | No discharge hoses in vicinity of watercourses. | Periodic during operation phase | - |
| 4 | Drainage and effluent Management | Ensure drainage system and specific design measures are working effectively. Design to incorporate existing drainage pattern and avoid disturbing the same. | Visual inspection of drainage and records thereof | Periodic during operation phase | - |
| 5 | Water Quality and Water Levels | Monitoring used water quality & groundwater quality and levels | Comprehensive monitoring as per IS 10500 Groundwater level bgl | Periodic during operation phase | |
| 9 | Maintenance of | Vegetation, greenbelt / | No. of plants, | Periodic during | - |

| Sr. No. | Potential Impact | Action to be Followed | Parameters for Monitoring | Frequency of Monitoring | Location |
|---------|------------------|--|---|---------------------------------|------------------|
| | flora and fauna | green cover development | species | operation phase | |
| 10 | Waste Management | Implement waste management plan that identifies and characterizes every waste arising associated with proposed activities and which identifies the procedures for collection, handling & disposal of each waste arising. | Records of solid waste generation, treatment and disposal | Periodic during operation phase | |
| 11 | Soil quality | Maintenance of good soil quality | Physico-chemical parameters and metals. | Periodical monitoring | Plantation areas |
| 12 | Health | Employees and migrant labour health check ups | All relevant parameters including HIV | Regular check ups | - |

5.6 Monitoring Methods

5.6.1 Air Quality Monitoring

5.6.1.1 Workspace Monitoring

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

5.6.1.2 Ambient Air Quality Monitoring

The ground level concentrations of PM₁₀, SO₂ and NO_x in the ambient air shall be monitored at regular intervals. Any abnormal rise shall be investigated to identify the causes and appropriate action shall be initiated. Greenbelt shall be developed for minimising dust propagation.

5.6.2 Water Quality Monitoring

Periodic water audits shall be conducted to explore further possibilities for water conservation.

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) are recommended.

5.6.2.1 Groundwater

The monitoring of groundwater is the most important tool to test the efficiency of mining performance. It is suggested to collect water samples nearer to mine site and analyse. Records of analysis should be maintained.

5.6.2.2 Surface Water

Nearest surface water source is Chhouch Khad. It is suggested to collect surface water samples from upstream and downstream directions to assess the quality of the water. Records of analysis should be maintained

5.6.3 Noise Levels

Noise levels shall be monitored in the mine area. The noise monitoring shall be conducted in regular intervals at working zone and near main gate.

5.7 Reporting Schedules of the Monitoring Data

It is proposed that voluntary reporting of environmental performance with reference to the EMP should be undertaken.

The environmental monitoring cell shall co-ordinate all monitoring programmes at site and data thus generated shall be regularly furnished to the state regulatory agencies.

The frequency of reporting shall be on six monthly basis to the local state PCB officials and to Regional office of MoEF. The Environmental Audit reports shall be prepared for the entire year of operations and shall be regularly submitted to regulatory authorities.

5.8 Data Analysis

Monitoring data analysis will be done as per CPCB guidelines by EPA approved laboratory & shall be submitted to concern authority (specified in Environment Clearance Letter issued by MoEF, & Consent issued by HPSPCB) on regular basis.

5.9 Detailed Budget

- Annual turnover of the project is Rs. 34,98,000/=
- Cost proposed for EMP measures is Rs. 1,50,000/=
- Recurring Cost for EMP: Rs. 50,000/ annum
