

PROPOSED TERMS OF REFERENCE FOR EIA STUDIES

The Base line data will be collected for one full season (other than Monsoon) in the study area and within 10 kms radius from project site. Based on the Meteorological data collected from Indian Meteorological Department, the AAQ monitoring has been started and the details are as given below.

1.1 Baseline Environmental Monitoring

Field studies will be conducted to determine existing conditions of various environmental attributes like ambient air quality, water quality, soil characteristics, noise levels, land use pattern, demographic pattern etc. within the 10-km radial distance from the project site. The details of the monitoring are given in **Table-1**.

TABLE-1: ENVIRONMENTAL ATTRIBUTES & FREQUENCY OF MONITORING TO BE ADOPTED

Sr. No.	Attribute	Parameters	Frequency of Monitoring
1	Ambient Air Quality	PM ₁₀ , PM _{2.5} SO ₂ , NO _x	The monitoring will be carried out at 7 villages and 1 at project site at a frequency of 24 hourly samples, as per CPCB Guidelines.
2	Meteorology	Wind Speed and Direction, Temperature, Relative Humidity and Rainfall.	a] Continuous monitoring with hourly recording through setting up of on-site automatic meteorological station; b] Data collected from secondary sources like nearest IMD station.
3	Water Quality	Physical, Chemical and Bacteriological Parameters.	6 ground water + 1 surface water samples will be collected during the study period.
4	Ecology & Bio-diversity	Existing terrestrial and aquatic flora and fauna.	Through field visits and secondary data.
5	Noise Levels	Noise levels in dB (A).	Once during study period at 8 locations.
6	Soil Characteristics	Soil profile, characteristics, soil type and texture, heavy metal, NPK value etc.	Once during study period at 5 locations.

Sr. No.	Attribute	Parameters	Frequency of Monitoring
7	Land use	Land use for different categories.	Land use as per the district census handbook as well as with the help of satellite imagery survey.
8	Socio-Economic aspects	Socio-economic characteristics, labor force characteristics, etc	Based on the data from latest published District census handbooks.
9	Geology	Geological history	Based on the data collected from secondary sources.
10	Hydrology (Surface and Ground)	Drainage area and its pattern, nature of streams, aquifer characteristics, recharge and discharge areas.	Based on the data collected from secondary sources.
11	Traffic Study	Traffic density	At the Project site and nearest State Highway Mundargi – Chikkabaganal.

2.0 ENVIRONMENTAL IMPACT ASSESSMENT

The expansion project may cause some impacts on the overall quality of the surrounding environment. The parameters likely to be affected are air quality, water quality, soil quality, noise levels, etc, on account of gaseous emissions, liquid effluent discharges, resultant particulates etc.

The baseline data generated from the field level studies will be analyzed and compared with applicable standards prescribed by the CPCB and KSPCB. By this process, the impact caused by the proposed project, whether positive or negative would be assessed and the environmental attributes requiring special attention for mitigating the negative impact, if any will be identified. Also the areas, which fulfill the prescribed environmental norms and not requiring further improvements, would also be specified. Impact of air pollution on the surrounding ecology & environment will be carried out by using suitable Air Dispersion Modeling.

2.1 Impact on Land Use

2.1.1 Impact Assessment

The land use impacts due to proposed expansion project will be identified in terms of local land use planning efforts. The change in land use pattern of project site will also be identified. This will include visual impact, impact on forest, impact due to creation of

urban and industrial growth centers, impact due to growth of related manufacturing industries and other growth due to socio-economic factors.

2.1.2 Mitigation Measures

The mitigation measures will be addressed towards restoration of land disturbed by the proposed expansion project activities to the extent possible. Planning efforts for the changed socio-economic will also be identified.

2.1.3 Impact on Water Environment

2.1.3.1 Impact Assessment

The impact of the proposed expansion due to water usage and waste water discharges will be addressed. The method of impact analysis will depend on the amount of details available from various sources. The analysis will also include study of the water balance of the project to determine the feasibility of the source and its adequacy.

2.1.3.2 Mitigation Measures

The mitigation measures will be addressed to ensure that the present and anticipated future water requirements for various purposes are not adversely affected by the project requirements. The suitable measures will also address the need to maintain or improve the existing

Classification of Water (as per IS: 2296) to ensure that the current /proposed uses are not impaired due to deterioration of the water quality.

2.1.4 Impact on Demography and Socio-Economics

2.1.4.1 Impact Assessment

The Socio-economic impacts by comparing the existing and likely post-project scenarios for demography, facilities and services, agricultural sector, civic infrastructure and basic amenities, industrial growth, economic status and health status etc will be carried out.

2.1.4.2 Mitigation Measures

The role of different bodies in mitigation measures will be identified. The need for developing schools, housing, medical facilities and other civic amenities will be assessed while suggesting such mitigative measures.

2.1.5 Impact on Soil

2.1.5.1 Impact Assessment

The Impact on soil characteristics may include destruction of soil profile; changes in soil productivity, increased soil erosion will be assessed. The overall impact assessment will include an analysis of susceptibility of the area to loss of agricultural production, change in crop pattern etc. Details on the generation of solid wastes from the proposed expansion activity will be collected. Impact assessment of disposal of solid waste will be addressed taking into consideration of its effect on human settlement, vegetation, ground water contamination etc.

2.1.5.2 Mitigation Measures

Based on analysis of soil data, mitigation measures will be proposed which will avoid, prevent, minimize or compensate for significant adverse impact on the surrounding soil characteristics.

2.1.6 Impact on Hydrology

2.1.6.1 Impact Assessment

The impacts of the proposed expansion due to water usage and wastewater discharges will be addressed.

2.1.6.2 Mitigation Measures

There are some examples of potential mitigative measures applicable to reduce adverse impact on the surface water sources at the project area related to construction of water holding ponds, establishing waste water recycling facilities, containment of air emissions by providing required air pollution control equipments etc. The suitable Control measures will be identified & suggested. Potential alterations of ground water will be identified during impact assessment studies. These impacts can affect local/regional ground water quality due to leaching or infiltration of surface run-offs originating from proposed project site. This will then have to be controlled to prevent recharge of contaminants to alluvial and bedrock aquifer system. Potential movement of contaminants associated with the disposal of wastewater too will have to be controlled.

2.1.7 Impact on Water Quality

2.1.7.1 Impact Assessment

It is proposed to establish the impact of discharge of liquid effluents on natural water bodies receiving the effluents and clearly spell out the significant parameters, which are likely to change the water quality critically.

2.1.7.2 Mitigation Measures

Considering the dependence of the people of the plant area on surface or ground water as sources for drinking purpose, the prevailing quality and extent of contamination due to proposed expansion activities, the mitigation measures will include the treatment required for meeting the effluent discharge standards (achieve 50% or less) specified under the Environment Protection Rules and KSPCB. The disposal arrangement will also be conceptually indicated.

2.1.8 Impact of Meteorology

2.1.8.1 Impact Assessment

The climatological factors, which play an important role in the environmental analysis during the process of transportation, dilution and dispersion of pollutants, will be analyzed. The meteorological data will be collected to prepare wind roses, to ascertain the atmospheric stability conditions and prevalence of inversion levels around the project. This will enable to define the atmospheric conditions likely to prevail during different months of the year and use it as a basis for air quality modeling studies.

2.1.9 Impact on Ambient Air Quality

2.1.9.1 Impact Assessment

The Emission inventory will be carried in an area of 10-km around the project area. A computer based internationally recognized mathematical air quality model (e.g. ISCST-3) suitable for the region will be identified and run to predict the concentration of SO₂, NO_x & SPM due to the operation of the proposed project. The model would also take into account other sources of pollution and topographical features of the area. The emission of relevant pollutant (SO₂, NO_x and PM) from nearby sources shall be used in the model for more accurate estimate of air quality. The results will be presented for seasonal and short term (24 hourly) concentrations over a radius of 10-km around the proposed expansion project area. The dispersion model results will be included in the report

using isopleths or other graphical methods, over laying a land use map of the surrounding area.

The predicted air quality will be compared with existing regulations and mitigative measures, if any, will be identified. The long term and short term impact at all the monitoring locations shall also be estimated.

2.1.9.2 Mitigation Measures

The potential mitigation measures during project operation include protection of habitats adjacent to the proposed project site, soil erosion control measures, compensation of loss of forage for livestock and wildlife by improving vegetation in the adjacent areas, reclamation/ restoration of disturbed area etc. In case of aquatic ecological impact, mitigation measures will be addressed for restoration of physical and chemical water quality characteristics through pollution control measures.

2.1.10 Impact on Noise

2.1.10.1 Impact Assessment

Sources of noise and its impact on the environment would be clearly brought out. The noise level at varying distances for multi-sources will be predicted using suitable model. A comparison of measured noise levels (Leq) at the critical monitoring locations to that of predicted noise levels (Leq) would be made and mitigatory measures required, if any, will be recommended to conform to the regulatory ambient air noise standards.

It is proposed to estimate the increase in noise levels over the baseline conditions in different zones like industrial, residential and sensitive areas like hospitals, wild life habitation etc. The potential noise level exposure will be determined and evaluated for acceptable limits of exposure.

2.1.10.2 Mitigation Measures

The potential mitigation measures will be addressed for reduction in noise levels by controlling at the source, provision of greenery to absorb noise during its propagation, isolation of high noise generating sources, use of protective measures especially in high noise areas.

2.1.11 Impact on Ecology

The impacts on aquatic species especially during dry season will be assessed particularly those which are endangered. The parameters which are of concern are TSS, TDS, heavy metals, oil and grease, pH and temperature. The assessment will also include impacts of chlorinated organic chemicals. The impact of site preparation activities that may involve site clearing, excavation, earth moving will be assessed. This assessment will give priority to impacts on endangered species, if any. Measures to mitigate such adverse impacts as soil erosion and habitat loss will be addressed. In addition, impact of fugitive and stack emissions will be assessed on the surrounding species of economic/genetic/biological importance.

2.2 Environment Management Plan

Environment Management Plan will be prepared based on the prediction of potential impacts and review of proposed control measures in the plant.

2.3 Green Belt Development Plan

A green belt development plan for the proposed expansion project site would be included in the EIA report. Details viz areas to be planted, suitable plant species, plantation technique and necessary infrastructures required for plantation etc. would be clearly mentioned.

2.4 Emergency Preparedness Plan and Occupational Safety

An Emergency Preparedness Plan (EPP) for dealing emergency situation arising due to accidents of fire, explosion, leakages of hazardous substances, etc. in the plant will be prepared. The plan would also include storage, handling, transportation etc. of the hazardous and toxic materials to be used in the project.

The occupational risk involved during construction and operation of the project would be assessed and necessary safety protective measures would be spelt out. The EPP would include both onsite and off site plans.

2.5 Post Study Monitoring Plan

It is necessary to monitor certain environmental parameters identified as critical or as required by regulatory agencies. Considering the requirements of Regulatory Agencies and identified critical parameters, it is proposed to design post environmental monitoring studies. All equipment and manpower requirement will be identified for necessary implementation of the above programme.

The Post Project Monitoring (PPM) requirements will be proposed considering:

- ⊙ The proposed pollution control measures for air, water, wastewater and solid waste (hazardous/non-hazardous) disposal;
- ⊙ Waste minimization; wastewater management, waste reuse and resource recovery; waste segregation to make the treatment and disposal cost-effective;
- ⊙ The monitoring requirements for ensuring the statutory as well as process data will be collected; and
- ⊙ The organizational set-up required to meet the above.