

Executive Summary

1. PROJECT DESCRIPTION

Chhattisgarh State Industrial Development Corporation Limited (CSIDC), which has been setup by the State Government for developing Industrial Estates and providing Industrial and Social Infrastructure on an integrated basis proposes to develop a Large Industrial Area (IA), at Dagori in Bilaspur District for an already identified location with a view to seek the Grant-in-Aid of the State Government.

The Plan and estimates have been preceded by review of existing resources and infrastructure in Bilaspur District in general and around the proposed Industrial Area.

A piece of land admeasuring about 1967 Acres has been identified for development, out of which about 1313 Acres would be available for different types of Industrial Plots and the balance has been divided under Roads, Amenities and Open Space. About 300 Tiny/Small/Medium/Large Scale Industrial Units are likely to be set up in this Industrial Area.

2. LAND UTILISATION

S. No	Particulars	Area (Acres)	Area (Ha.)
1	Gross Area Proposed to be Acquired	1967.00	796.0449
2	Net Saleable Area (66.75%)	1313.00	531.3711
3	Area covered under Roads (10.00%)	196.70	79.6044
4	Area covered under Amenities (23.25%)	457.30	185.0693
Expected Direct Employment Potential (No.s)			5000

20% of the total available area will be used for Green belt development.

3. POSSIBLE INDUSTRIAL UNITS

Based on the facts & figures pertaining to the Present National / State Industrial Scenario and the availability of various Resources; a presumption on the possibilities of type of Industrial Units in proposed LIA at Bilaspur District has been worked out. The list of the presumed Industrial units along with their tentative land and water requirements are presented in the report. Needless to mention that the list is and indicative one only and not exhaustive and there is a scope for additions & subtractions in future on the basis of the actual Industrial Growth experienced by the District after the establishment of the LIA.

- Ø Iron and Steel Industries
- Ø Power Plants
- Ø Mineral Based industries

- Ø Food Processing Industries
- Ø Engineering Based industries

Bifurcation of Units with whom the MoUs have already been executed in four proposed Large Industrial Areas.

S. No	Particulars	Remarks
1	No of MoUs Executed	46
2	No of Units who have not yet identified their Location	13
3	No of Units to be proposed at LIA-Rajnandgaon (S. Nos 13, 14, 15, 16 & 17 of the List of MoUs)	05
4	No of Units to be proposed at LIA – Dagori (S. No 35 of the List of MoUs)	01
5	No of Units to be proposed at LIA – Raipur(S. No 24, 39 & 44 of the List of MoUs)	03
6	No of Units to be proposed at LIA – Raigarh (S. No 42, 43, 45 & 46of the List of MoUs)	04
<i>Source : SIPB</i>		

3.1. LIST OF INDUSTRIES BASED ON MOU & POTENTIAL

S. No	Type of Industry	Nos
A	Based on MoUs {Collectively 1 Unit}	
1	Integrated Steel Plant	1
2	Captive Power Plants	1
Sub-Total A		1
B	Based on Potential	
1	Bio-mass Power Plant	1
2	Captive Power Plant	1
3	Thermal Power Plant	1
4	Sponge Iron Plant	3
5	Mini Steel Plant	3
6	Rolling / Re-Rolling Mills	3
7	Ferro-Alloys Plants	1
8	Steel Forging Units	1
9	Food Processing Based Units	22
10	Civil Engineering Based	3
11	Mech., Electrical, Auto. Engg. Based	30
12	Mineral Based Units	6
13	Chemical / Allied Engg. Based	13
Sub-Total B		88
GRAND TOTAL {A + B }		89

4. LAND REQUIREMENT

Type of Industry	No	Land Requirement (in Acres)	Capacity (TPD or Obvious)
Based on MoU (collectively 1 unit)			
Integrated steel plant	1	350	1350
Captive power plant	1	250	82 (MW)
Sub Total	1	600	
Based on Potential			
Biomass Power Plants	1	50	6 (MW)
Captive Power Plants	1	20	4 (MW)
Thermal Power Plants	1	50	25 (MW)
Sponge Iron	3	90	600
Mini Steel Plant	3	30	252
Rolling/Re-Rolling mills	3	15	288
Ferro-Alloys plants	1	50	250
Steel forging unit	1	5	100
Food Processing Based Units	22	80	1686.4
Civil engineering based	3	3	1.2
Mech,Elect, Auto Engg. Based	30	53	105
Mineral based	6	90	330
Chemical/Allied Engg. Based	13	164	3821.8
Sub Total	88	700	
Grand Total	89	1300	

5. WATER REQUIREMENT

The water requirement is mainly for process, domestic purposes, dust suppression and green belt development.

Type of Industry	No	Consumption KLD	Source
Based on MoU (collectively 1 unit)			From Sheonath river
Integrated steel plant	1	1350	
Captive power plant	1	8200	
Sub Total	1	9550	
Based on Potential			
Biomass Power Plants	1	600	
Captive Power Plants	1	400	
Thermal Power Plants	1	2500	
Sponge Iron	3	150	
Mini Steel Plant	3	88.2	
Rolling/Re-Rolling mills	3	28.8	
Ferro-Alloys plants	1	25	
Steel forging unit	1	5	
Food Processing Based Units	22	84.32	
Civil engineering based	3	0.06	
Mech,Elect, Auto Engg. Based	30	5.25	
Mineral based	6	49.5	

Chemical/Allied Engg. Based	13	191.09	
Sub Total	88	4127.22	
Grand Total	89	13677.22	

Maximum Quantity of water required- 3.03 MGD (13.68 MLD)

The water requirement will be met from Sheoath River through the existing water supply system.

5.1 SUMMARY OF PROPOSED UNITS-LAND & WATER REQUIREMENT

S. No	Particulars	MoUs	Proposed	Total
1	Assumed Units (nos)	1	88	89
2	Requirement of Land (Acres)	600.00	700.00	1300.00
3	Requirement of Water (KLD)	9550.00	4127.22	13677.22
4	Requirement of Water (MLD)	9.55	4.13	13.68
5	Requirement of Water (MGD)	2.12	0.92	3.03

6. POWER REQUIREMENT

Source	132/33 KV Power supply line of CSEB sub station near the site
Capacity/Distance of sub station	132/33 KV sub station at Dagori & 11 KV line passing through the site another source at Belha
Power cuts	No

7. MANPOWER

Total manpower required will be approx 5000 no. Labours will be available from nearby villages. The approx wage rate fix for labours is Rs 75/person/day (min). Training facilities will also provided to workers in ITI at Hathbandh, Polytechnic at Durg, Engineering Colleges at Raipur, Durg and Bilaspur

8. DESCRIPTION OF ENVIRONMENT

Baseline Data Collection is carried out according to the general guidelines, which are given as follows:

- a. Baseline data should reflect conditions that would have been expected at the assessment area taking into account both natural processes that are the result of human activities;
- b. Baseline data should include the normal range of physical, chemical, or biological conditions for the assessment area with statistical descriptions of that variability. Causes of extreme or unusual value in baseline data should be identified and described;

- c. Baseline data should be as accurate, precise, complete and representative of the resource;
- d. Baseline data collection shall be restricted to those data necessary for reasonable cost assessment. In particular, data collected should focus on parameters that are directly related to the area being assessed.

8.1. METEOROLOGICAL CONDITIONS

Dominant Wind Direction and Sped

A meteorological station was installed to study the meteorological conditions of the study area during pre-monsoon season 2006.

The most dominant direction from which winds were blowing with a speed upto 10 Kmph and above was from North with a percentage frequency recording of 22.87% of the total time.

Temperature

During the study period, the maximum and minimum temperature observed to be 44⁰C & 16⁰C respectively.

Relative Humidity

The mean relative humidity observed during the study period is 68%.

8.2. AMBIENT AIR QUALITY

The principle objective of the ambient air quality monitoring was to assess the existing levels of the air pollution as well as the regional background concentration in the project area.

Parameters Monitored

SPM	:	Suspended Particulate Matter
RSPM	:	Respirable Suspended Particulate Matter
SO ₂	:	Sulphur-dioxide
NO _x	:	Oxides of Nitrogen
CO	:	Carbon-monoxide

A total of 30 ambient air quality monitoring stations were selected. Pre-calibrated RD samplers have been used for monitoring the existing AAQ status as per CPCB guidelines.

Summary of Baseline Concentrations

The Ambient Air Quality levels in the study area are summarized below.

	SPM	RPM	SO₂	NO_x
Study Area	108 – 138	32.0 – 48.0	5.2 – 14.9	7.8 – 24
Standard	200	100	80	80
HC & CO values at all location in core and buffer zone are found to be <1 ppm				

Units: µg / m³

The Oak Ridge Air Quality Index Value obtained conforms that the area is rather healthy even though some of the High Air polluting industries are present in the study area.

8.3. BASELINE NOISE ENVIRONMENT

Noise in general is an unwanted sound, which is composed of many frequency components of various loudness distributed over the audible frequency range.

Noise Level Monitoring Data {dB(A)}

Code	Location	Min	Max	L _d	L _n	L _{dn}
N-1	Dhauntabhatha	40.0	51.3	46.7	41.1	45.0
N-2	Pandarwa	39.6	51.0	46.0	41.7	45.7
N-3	Dodki	41.3	52.2	47.4	42.9	46.2
N-4	Bhaisbod	40.2	52.3	47.5	41.7	47.0
N-5	Kewanchi	42.1	53.2	48.3	43.8	48.1
N-6	Sambalpuri	40.4	52.0	46.8	42.5	45.3
N-7	Udgan	41.8	52.8	48.0	43.5	48.5
N-8	Kirari	40.0	52.1	47.1	41.4	47.0
N-9	Godhi	40.1	51.6	46.5	42.2	46.0
N-10	Bilha	39.8	51.7	46.9	41.2	45.2
N-11	Dagauri	39.9	51.4	46.3	42.0	46.1
N-12	Nawagaon	41.6	52.5	47.8	43.2	45.4
N-13	Bitkuli	42.5	53.7	48.8	44.2	48.0
N-14	Guma	40.6	52.8	47.9	42.1	47.0
N-15	Senwar	40.8	52.5	47.3	42.9	45.6
N-16	Mahda	38.4	49.4	44.5	40.4	43.2
N-17	Amda	38.2	49.7	45.1	39.6	43.5
N-18	Kharkena	40.2	50.5	45.9	41.6	45.5
N-19	Pendridih	40.8	51.5	45.9	41.6	44.2
N-20	Sargaon	39.0	50.7	46.0	40.4	45.1
N-21	Chunahuniya	39.1	50.4	45.4	41.2	45.0
N-22	Birkoni	41.5	52.4	47.6	43.1	46.2
N-23	Dighora	39.7	51.6	46.8	41.1	46.2
N-24	Nipaniya	39.8	51.3	46.2	41.9	45.7
N-25	Bhojpuri	42.7	53.9	49.0	44.4	48.4
N-26	Paunsari	41.0	52.8	47.5	43.1	46.5
N-27	Chaddkhar	40.8	53.1	48.1	42.3	47.3
N-28	Kaya	40.1	52.2	47.4	41.6	45.4
N-29	Kankdar	40.3	51.9	46.7	42.4	47.2
N-30	Murhipar	42.0	53.1	48.2	43.7	48.0

The values of noise observed are primarily due to the vehicular traffic and other anthropogenic activities in villages where as in plant area the industrial activities also contribute. The day equivalent and night equivalent values observed for all the locations are with in the AAQ standards specified by CPCB.

8.4. BASELINE WATER QUALITY

Four locations for Surface Water quality analysis and 28 locations for Ground Water analysis were selected.

Surface Water Quality

pH range: 7.08 - 7.70

Chloride concentration in samples : Range 34 – 309 mg/l

Sulphate levels : Range 44 - 115 mg/l

Nitrate levels : Range 1.2 – 30 mg/l

Flouride levels : Range 0.75 – 1 mg/l

Total hardness : Range 180 - 260 mg/l

Ground Water Quality

pH range: 7.06 – 8.0

Chloride concentration in samples : Range 20 – 323 mg/l

Sulphate levels : Range 12 – 475 mg/l

Nitrate levels : Range 1.2 – 56 mg/l

Flouride levels : Range 0.4 – 1.2 mg/l

Total hardness : Range 170 - 650 mg/l

In ground water except fluoride at Gorhi village (1.2 mg/l) and hardness at Chandkhur village (650 mg/l) all other parameters were within the permissible limits in all areas.

8.5. SOIL QUALITY

For studying the soil types and soil characteristics, 30 sampling locations were selected to assess the existing soil conditions representing various land use conditions and geological features.

The homogenized soil samples collected at different locations were packed in a polyethylene plastic bag and sealed. The sealed samples were sent to laboratory for analysis. The physical, chemical parameter concentrations were determined from all samples.

- The pH values obtained are in the range of 6.03 to 7.99 showing that the soils are normal to alkaline in nature.
- Available nitrogen of the soil sample collected from study area were in range of 40 - 860 kg/hect. Out of 30 samples collected, 12 were showing low nitrogen content, 12 are with moderate amounts of available nitrogen and 5 are having high nitrogen content.
- Available phosphorous in form of P_2O_5 present in the soil sample collected from the study area are found to be in the range of 9 – 152kg/hect. Out of these one is having low, three are having medium and 26 are having high phosphorous content.
- Available Potassium in the form of K_2O present in the soil sample collected from the study area are found to be in the range of 115 – 1344 kg/hect. Out of these six are having medium and rest 24 samples are having high potassium content.

- Percentage of organic carbon present in the soil of the study area are found to be in range of 0.15 – 1.26 %. One locations having low, 14 having medium and 15 having high Carbon content in the soil.

8.6. FLORA AND FAUNA

FLORA IN CORE AND BUFFER ZONE

S. No	Scientific Name	Common Name	Family Name
1)	Acacia Arabica	Babul	Leguminosae
2)	Albizzica procera	Safed	Leguminosae
3)	Azadiracta indica	Neem	Meliaceae
4)	Eucalyptus Spp	Nilgiri	Myrtaceae
5)	Dalbergia latifolia	Shisham	Leguminosae
6)	Dalbergai Sisoo	Sissoc	Leguminosae
7)	Chloroxylon Swietenia	Bhirra	Caesalpiniaceae
8)	Bridelea retusa	Kasai	Euphorbiaceae
9)	Diosphyros melanoxylon	Tendu	Ebenaceae
10)	Madhuca indica	Mahua	Sapotaceae
11)	Pongamia Pinnats	Karanj	Papilionsceae

FAUNA IN CORE AND BUFFER ZONE

S.No	Scientific Name	Common Name	Family Name	Schedule
1	Hyaena hyaena	Striped hyena	hyaenidae	Schedule III

8.7. SOCIO-ECONOMIC STUDIES

There is no human habitation within the core area. The 25 km buffer zone for the mine comprises 200 villages. The socio-economic condition is summarized below:

- § The population of the study area is 4,96,906 and no of household are 95885.
- § Males contribute to about 51.5% of the total population of the study area and females to about 48.5%
- § S.C. population contributes to about 16% of the entire population of the study area and S.T. population is about 8% of the total study area of the entire population of the study area.
- § Literacy rate in the study area is 64%.
- § The total working population in the study area is 174602 Main workers are about 144611 and marginal workers about 29991.
- § All the villages in the study area are electrified.
- § The study area has adequate medical and health facilities in the form of health centers and hospitals.
- § The study area has adequate educational facilities like primary, secondary and highs schools and colleges.
- § Communication systems in the study area are well developed.

9. ANTICIPATED ENVIRONMENTAL IMPACTS

9.1. NATURE OF IMPACTS DURING CONSTRUCTION PHASE

Activity	Impact	Net result
Acquisition of land for industrial development	Affect the present land use pattern. The presence of sensitive areas, archeological sites, human settlements may create conflicts.	Moderate
Removing undulating ground to facilitate construction	Affects air quality due to increase in SPM levels, impact on flora and fauna, impact on noise quality.	Negligible
Construction of roads and civil engineering structures	Affects air quality due to increase in SPM and NO _x levels, impact on noise quality.	Negligible
Migration of Labour	Impact on infrastructure like housing, creates health hazards due to poor sanitation problems.	Negligible

9.2. NATURE OF IMPACTS DURING OPERATION PHASE

Activity	Impact	Net Result
Air emissions	Affects air quality, ecology due to increase in SPM, SO ₂ , NO _x and HC levels depending upon the type of process and energy requirements of an industry	Moderate to high
Effluent discharges	Affects water quality, soil quality of the region due to release of both organic and inorganic pollutants	Moderate
Noise emissions	Affects community noise environment of the region due to increase in day-night equivalent noise levels	Moderate
Transportation	Impact on existing infrastructure	Moderate

9.3. IMPACTS ON AIR

At this preliminary stage, the industries that are going to be located in the Industrial area are not yet finalized. As per MoUs only one industry is proposed (i.e. integrated steel plant) and other industries having potential growth & development are envisaged hence, the pollution load is estimated by considering the likely scenarios after considering the area sources as input. It is considered that the Industrial Area will have long-term impacts on the environment due to its complex and variable set up. In view of this, long term averages are considered in estimating pollution load.

9.4. IMPACTS ON WATER

The proposed Industrial Area will meet the requirement of water for its uses from the Sheonath River flowing from North proposed industrial area. The proposed water requirement is around 2.12 MGD.

Waste Water Generation

Water requirements of the proposed site will be met by Sheonath River. Water consumption in the proposed site is estimated to be about 13677.22 kl/day respectively. In industries basic requirement of water will be in standby power supply system, domestic requirement, greenbelt development and housing facility.

Wastewater obtained from industries is generally much more polluted than the domestic or even commercial wastewater. Industrial wastewater usually contains several chemical pollutants and toxic substances in too large proportion. The characteristic of the produced wastewater will usually vary from industry to industry and also vary from process to process.

Suitable pretreatment to the wastewater of industries before subjecting to biological treatment is thus the prime requirement for designing and planning the treatment plant. Possible large scale reuse of the treated water in the industries is another important factor which must be considered while deciding the sequence of treatment process. Such a possible reuse if can made be possible will help in large scale economy in the industry.

During operation phase waste water will be generated from various industries, Effluent treatment plant will be proposed in the project site for the treatment of waste water. There shall, thus be no adverse impact on the surface water quality.

A common effluent treatment plant is proposed to be constructed in the proposed Industrial Area at Dagori.

9.5. IMPACTS ON NOISE LEVEL

The activities, which produce periodic noise, during construction phase, are as follows:

- Foundation construction including pile driving;
- Infrastructure construction, and
- Plant erection

The noise control measures during construction phase include provision of caps on the equipment and regular maintenance of the equipment. Workers working near noise generating equipment would be provided with noise protective equipments like earmuffs and earplugs. Overall, the impact of generated noise on the environment is likely to be insignificant, reversible and localized in nature and mainly confined to the day hours.

9.6. IMPACT ON LAND USE

Presently, the most part of proposed plant site is under dry crop cultivation. The construction of plant would bring in certain immediate changes in the land use pattern of the proposed area as well as in the vicinity. The likely changes in the land use would be in the following areas.

- ü Labour population attraction and construction of temporary hutments.
- ü Pressure on land would increase due to ancillary industries and other service stations.

Overall, there will not be any adverse impact on the surrounding land use during the construction period.

9.7. IMPACT ON TOPOGRAPHY AND CLIMATE

The major topographical changes envisaged would be manmade structures like civil structures and industrial complex. However, it will also invite some positive benefits in the form of land leveling, tree plantations, greenbelt development, etc., in the plant vicinity.

Impact on the climatic conditions from the proposed industrial area will be marginal. Normally, the proposed industries will not cause any thermal imbalance and the proposed plant authorities will implement plantation program in the plant premises to balance the impact generated, if any.

9.8. IMPACT ON SOIL QUALITY (SOLID WASTE)

The wastes generated from the proposed site are segregated into Hazardous and non Hazardous wastes. Non hazardous waste will be properly disposed from the proposed site. Organic waste generated from food processing industry contains higher amount of BOD and COD, proper biological treatment will be provided to these kind of waste so the chances of surface water from getting polluted from run-off over waste heaps or groundwater pollution from leachate are minimum.

Proper segregation of hazardous and non-hazardous solid waste and disposal of hazardous waste in a Engineered Storage and Disposal facility (TSDF) is recommended. The solid waste generated from construction activities will be used as filling material to level the total site. Thus, no adverse impact on the environment is envisaged due to disposal of solid waste generated from the industries.

Hazardous waste includes metals like zinc, lead, chromium etc that will generate from different industries and are highly toxic. Proper precaution will be taken in disposing such kind of waste, which includes:

- Ø Hazardous wastes are packaged in a manner suitable for safe handling, storage and transport. Labelling on packaging is readily visible and material used for packaging shall withstand physical conditions and climatic factors.
- Ø The generator shall ensure that information regarding characteristics of wastes particularly in terms of being Corrosive, Reactive, Ignitable or Toxic is provided on the label.
- Ø Transport of hazardous wastes shall be in accordance with the provisions of the rules made by the Central Government under the Motor Vehicles Act, 1988 and other guidelines issued from time to time.
- Ø All hazardous waste containers shall be provided with a general label as given in Form 8 in Hazardous Waste (Management & Handling) Rules, 1989, as amended.

9.9. IMPACT ON TERRESTRIAL ENVIRONMENT

As most of the land identified for the project is dry agriculture, there would not be any loss of trees and shrubs. Proper Rehabilitation package as developed by Government of Chhattisgarh. will be given to farmers for the loss of any agricultural lands.

Therefore, the impact of construction activities on terrestrial environment will be insignificant.

9.10. IMPACTS ON SOCIAL STRUCTURE

The impact of the proposed plant on demography and socio economic conditions of the study area is as follows.

- √ Increase of floating population.
- √ Additional strain on civic amenities like road, transport, communication, drinking water, sanitation and other facilities to meet the work force requirement
- √ Increase in demand of services includes hotels, lodges, public transport (including taxis), etc.
- √ Employment Opportunities for construction laborers, skilled and unskilled workers, local population,
- √ Economic upliftment of the area.
- √ Raising of Home rents and land prices and increase in Labour rates.
- √ Rapid growth of service sector will result in increase of incomes in the area.
- √ Beneficiation of the civil construction and transportation companies
- √ Expanding of services like retail shops, banks, automobile workshops, school, health care, etc.
- √ Increase in literacy rates.

10. ENVIRONMENTAL MONITORING PROGRAMME

In order to maintain the environmental quality within the standards, regular monitoring of various environmental components is necessary. Every industry will establish a dedicated Environmental cell to monitor and analyze the various environmental components of the plant.

Monitoring of various environmental parameters will be carried out on a regular basis to ascertain the following:

- ü State of pollution within the plant and in its vicinity;
- ü Generate data for predictive or corrective purpose in respect of pollution;
- ü Examine the efficiency of Pollution Control Systems installed in the complex
- ü To assess and monitor environmental impacts

A. Meteorology

An automatic weather monitoring station would be installed within the plant premises for a proper measurement and record of meteorological parameters.

B. Ambient Air Quality Monitoring

To determine the extent to which the plant contributes to pollution in the area, a AAQ monitoring along with the stack monitoring will be carried out. It is also proposed to monitor particulate emission qualitatively as per norms. The stack monitoring data will be utilized to keep a continuous check on the performance of ESP.

C. Wastewater Sampling

The wastewater samples will be collected regularly both at inlet and outlet of sewage treatment plant to assess the performance and compliance as per the norms.

D. Environmental Laboratory

A full-fledged environmental laboratory shall be established in the industries

11. ADDITIONAL STUDIES

11.1. IDENTIFICATION AND ASSESSMENT OF HAZARDS

A major emergency in a plant is one, which has the potential to cause serious injury or loss of life. It may cause extensive damage to property and serious disruption both inside and outside the plant. Sometimes, it would require the assistance of outside agencies. Emergency may be caused by a number of different factors, e.g. plant failure, and it will normally manifest itself in three basic forms, viz fire, explosion or toxic release.

This stage is crucial to both on site and off site emergency planning and requires to systematically identify what emergencies could arise in the plant. These should range from small events, which can be dealt with by plant personnel without outside help to the largest event for which it is practical to have a plan. Experience has shown that for every occasion that the full potential of an accident is realized, there are many occasions when some freak event occurs or when a developing incident is made safe before reaching full potential.

11.2. DISASTER PREVENTIVE MEASURES

For effective control of disaster adequate manpower, technical know-how, alertness and internal help are the prime requirements. It is always better to take preventive measures to avoid any disaster. In the proposed project following prevention measures will be taken to prevent disaster:

- i) Design, manufacture and construction of all plant and machinery's and buildings will be as per national and international codes as applicable in specific cases and laid down by the appropriate statutory authorities.
- ii) Provision of adequate access ways / walk ways for the movement of equipment and personnel are kept.
- iii) Minimum two numbers of routes for escape during disaster are provided and a separate escape route plan is in place.

Alarm Systems

On receiving the message of 'Disaster' from Disaster Controller, fire station control room attendant sounds SIREN WAILING TYPE FOR 5 MINUTES. On receiving the message of "Emergency Over " from Emergency controller the fire station control room attendant gives All Clear Signal by sounding siren straight for two minutes. The feature of the alarm system is explained to one and all to avoid panic or misunderstanding during disaster. Action to be taken on hearing the warning signal as follows:

- All the coordinator report to the Disaster Control Room, even if, not contacted by the cell

- The commanding officer and sub-commanding officer report to the place of the accident
- The process unit persons remain ready in their respective units for crash shut down on the instruction from the coordinator
- The person from other selection reports to the respective officer
- The concerned section (Civil Engineering services, Mechanical project etc) take immediate action to remove contractors personnel outside the plant gate
- The resident of action of the township will remain alert

12. PROJECT BENEFITS

The management has proposed to give preference to local people for recruitment in semi skilled and unskilled categories. A total of about 5000 persons would be given indirect employment during construction and installation.

Socio Economic Status in the study area is found to be moderate with respect to livelihood, amenities etc. Transport and other infrastructure facilities such as market centers, business establishment, recreation etc in the area will be improved.

Employment potential both direct and indirect coupled with business opportunities and strong social commitment of the company in the form of better educational and medical facilities would result in enhancement in the status and standard of living of the local population resulting in positive impact.

Due to the support services requirement of the guest community in the proposed plant, the host community will be benefited by way of generation of employment opportunities, increased demand for the local produce and services. Hence, there will be rise in the income level of the host community.

The surrounding human settlements are likely to experience migration from outside in view of the increased employment opportunities. Considering this aspect, the impact on human settlements will be beneficial.

Economic upliftment of the area is envisaged. Rapid growth of service sector will result in increase of incomes in the area. Benefits to the civil construction and transportation companies can take place. Expanding of services like retail shops, banks, automobile workshops, school, health care, etc.

13. ENVIRONMENTAL MANAGEMENT PLAN

13.1. RESETTLEMENT & REHABILITATION (R&R) PLAN

The rehabilitation and resettlement package should be in line with Government of Chhattisgarh guidelines. As per GOI, MoEF norms, every State Government has to formulate guidelines for rehabilitation and resettlement for their developmental activities.

13.2. AIR POLLUTION MANAGEMENT

Individual industries should take care of the pollution generated from their industries and use appropriate methods of control like

- Control at source for minimizing air pollution.
- Greenbelt development around the estate reduces odour and noise pollutions
- A common incinerator at places like landfill or CETP is preferred rather than having individual incinerators.
- Provision shall be made for sprinkling of water on loose soil to avoid dust generation.
- The debris and unutilized construction material and earth from the construction site shall be removed immediately to recycle within the project so that no nuisance dust is generated due to wind.
- The vehicles employed by the developers shall be checked for vehicular emissions. The developers shall also impress upon the service agencies to get vehicles regularly checked for vehicular emissions.
- Construction Activities shall not be allowed at Night. The mitigation measures shall include regular maintenance of machinery and provision of personnel protective equipments to workers where needed.

Various air pollution control equipments like Bag Filter and Electrostatic Precipitators (ESP) should be installed in industries to control the air emission. These equipments will be designed with high efficiency and working satisfactorily. Efficient working of these equipments will keep the stack emissions within the prescribed limits.

- ü Proper maintenance of roads in proposed site.
- ü Water spraying on roads should be done regularly.
- ü Plugging all leakages and enclosing storage and material handling systems.
- ü Open storage piles should be enclosed by providing green belt.
- ü Proper maintenance measure, all concerned workers should be provided with safety measures etc.
- ü Adopting any other system, which can reduce the level of in-plant fugitive emissions etc.
- ü Development and maintenance of green belt to attenuate the pollutants emitted from the industrial area.
- ü Ambient air quality and stack & fugitive emissions should be monitored regularly.
- ü Subsequent operation and maintenance of pollution control system should be followed to meet the emission limits.

In-plant fugitive emissions may have occupational health impacts on workers in long run, which can be mitigated and controlled by adopting certain mitigative measures.

- ü Through appropriate design, maintenance, operation of process and pollution control equipment; It will be possible to reduce SPM emission loads.
- ü Preventive maintenance and regular checking of ESP's installed for dust collection.
- ü All the Vehicles in the proposed area will have PUC (Pollution Under Control) certificate. All the unpaved roads as well as those paved roads, which are exposed to high dust concentrations within area will be sprinkled with water from time to time.

- ü The floor of the vehicle parking area will be constructed of plain concrete or least of brick-on-edge flooring.
- ü Plantation will be done along the roadsides wherever needed, to mitigate the vehicular fugitive emissions.
- ü Regular ambient air monitoring is conducted to check the satisfactory performance of the pollution control equipments.

13.3. NOISE POLLUTION MANAGEMENT

The following are the noise control measures proposed to be undertaken in the proposed project.

- Ø Provision of acoustic dampeners in foundations and insulators in the interiors
- Ø Encasement of noise generating equipment.
- Ø A thick greenbelt will be developed to act as noise attenuator.
- Ø In addition personnel working near high noise level generating sources will be provided with ear muffs.
- Ø Proper and suitable acoustic barrier will also be provided around areas generating high noise.
- Ø Effective preventive maintenance and vibration measurement of all rotating equipment will help in the noise reduction.
- Ø Automatic door enclosures for control room and laboratory etc

13.4. WATER POLLUTION MANAGEMENT

During construction, provision for infra-structural services including water supply, sewage, drainage facilities and electrification will be made. For domestic waste water:

- The construction site would be provided with suitable toilet facilities for the workers to allow proper standards of hygiene. These facilities would be connected to a septic tank and maintained to ensure minimum impact on the environment.

The total water requirement of proposed site is met from Sheonath River. Following measures are adopted for efficient water management in the proposed site including all the sections:

- ü In view of the scarcity of ground water and surface water, the wastewater after appropriate treatment and even the rainwater will be conserved and used.
- ü Rainwater harvesting will be recommended.
- ü The source of sewage water is from office toilets which are disposed off in to soak pit via septic tank. Treated Waste Water will also be used to control the fugitive emissions by water spraying.
- ü Waste water generated in site after operations in different industries will be treated properly in ETP and treated water will be used in dust suppression and greenbelt development.
- ü Collection, Treatment and Disposal of storm water
- ü Collection, Treatment and Disposal of sanitary and industrial waste water

Underground sewers are preferable to collect the Storm waters. Storm waters of open road drains are often misused as open sewers for the discharge of industrial and domestic wastewater and as well as dumps for disposal of solid wastes. Further more, it creates obstacle to the access of industries. In general, the storm water run-off is often polluted through dust, garbage and unprotected solid wastes.

Hence, a primary treatment in settling tanks or ponds is essential in order to minimize the pollution to a significant level before the disposal of these waters into the natural environment.

Keeping in view of the drainage pattern and the natural slope of the study area, the ETP for the industrial estate should be located on the southwestern side of the proposed development area. The extent of the area required for locating the treatment plant depends on:

- ü Unit Operations required for the treatment of the effluents
- ü Sizes of the Unit Operations
- ü Quantity of effluents generated
- ü Characteristics of the effluents
- ü Maintenance of Green Belt and Buffer distance around ETP area to avoid odour and emission problems.

The Characteristics and the flow of effluents play a vital role in identifying the common treatment facility. At present, the effluent treatment problem is handled by:

- Ø Individual approach
- Ø Sector-wise approach
- Ø Combined approach with or without pre-treatment

Combined Effluent Treatment Plan can be brought about efficiently by:

- Ø Zoning of Industries based on type of Pollutants
- Ø Encouraging diversified scales of industries in the same zone.

The advantages of CETP are:

- Ø Economy of scales
- Ø Full time supervision and control over treatment (Direct)
- Ø Easy Installation, Operation and Maintenance of treatment units
- Ø Hydraulic stability of treatment units
- Ø Conditioning and equalization of wastewater

13.5. SOLID WASTE COLLECTION AND DISPOSAL

Solid wastes from industrial sources, domestic sources and of Hazardous nature have to be collected, treated and disposed separately and the priority should be given to the resource recovery from the solid wastes.

- Incinerator for thermal treatment of hazardous waste, if needed, should be a common facility to optimize the cost and easier to maintenance.

- In order to lower the cost of transportation and for better safety, the disposal site of solid waste is preferred near the industrial estate with monitoring facility both from the point of view of surface run-off and ground water protection.

13.6. GREEN BELT – LIA Dagori

The plan for attenuation of the noise and air pollutant levels includes design for plantations around the proposed Industrial Area boundary, road-side, office buildings and stretches of open land. Out of the total available area (796 Ha.) as per the statutory requirements 20% of the total available land i.e. 160 Ha. will be covered under green belt. Apart from that it is recommended that every industry which is going to set up in the LIA-Dagori shall develop green belt of about 20% of the total allotted land to them. Apart from the green belt plan it is also proposed to develop road-side plantation, avenue plantation and nursery shall also be developed in the proposed Large Industrial Area.