Executive Summary

1.1 Project Description

M/s Agrawal Structure Mills Pvt Ltd (ASMPL)is a sponge iron manufacturing facility at plot no 18/1 & 675 Silpahari, Sirgitti Industrial Area, Bilaspur (C.G.).ASMPL proposes expansion of sponge iron production from 60,000 TPA to 1 65,000 TPA and WHRB from 4 MW to 12 MW. It is proposed to set up the additional 1 x 350TPA Kiln.ASMPL is having existing 2 x 100 TPD Kiln. The project location map is shown in **Figure 1.1**, 10 km study area map is shown in **Figure 1.2**and project details are shown in **Table 1**

As per the Environmental Impact Assessment (EIA); Notification S.O. 1533, 14.09.2006 issued by MoEFCC, Government of India, and the proposed Expansion project is categorized as Category – A project, which mandates obtaining prior Environmental Clearance from MoEFCC, GOI, NEW DELHI. **M/s Agrawal Structure Mills Pvt Ltd** submitted the application for Environmental Clearance as per the new notification along with prescribed Form-1, proposed Terms of Reference for EIA study and pre-Feasibility report. The proposal was considered by the Expert Appraisal Committee (EAC – Industry -1) and Terms of Reference was granted vide **File No: J-11011/44/2020-IA.II (I) Dated 4th Jan. 2021** for undertaking detailed EIA study along with the specific ToR which are incorporated in the EIA report.

Table-1: Details of the project

Sr. No.	Particular	Details
1	Land	Total land requiremnet is 54.0 Acres.
2	Water	Total water requirement for the project will be 1905 KLD. This requirement will be met from IDC CG water supply/Ground water.
3	Electricity	After Expansion total power requirement will be 3.0 MW. The power will be sourced from the WHRB power Plant
4	Man Power	The skilled/semiskilled /unskilled manpower required for the proposed Project is estimated is 92 no's and the existing Man Power is 66.
5	Investment	Existing:- Rs. 56.60 Crore, Proposed:- Rs. 100 Crore; Total:-Rs. 156.60 Crore
6	Plant &	Kiln, Raw Material handling unit, Air Pollution unit, Slag Management

	Machinery	Unit will be provided.
7	Raw Material	Iron Ore, Coal, Dolomite and Quartz. Source: Open Market.

Figure 1: Project Location Map
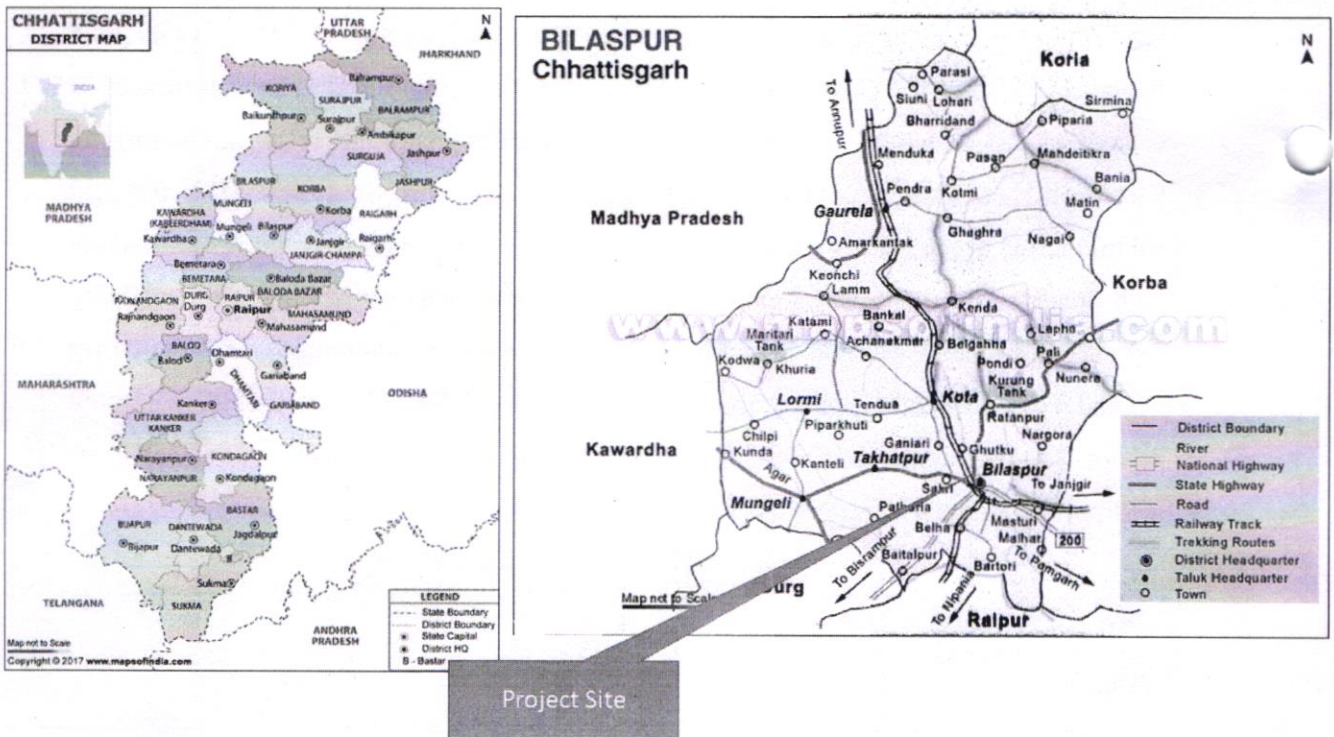
Project Site

Proposed expansion of existing Sponge Iron Plant by installation of 1 x 350 TPD DRI kilns along with expansion of CPP (WHRB) from 4 MW to 12 MW at Silpahari, Sirgitti Industrial Area, Bilaspur (C.G.) by M/s Agrawal Structure Mills Pvt Ltd.
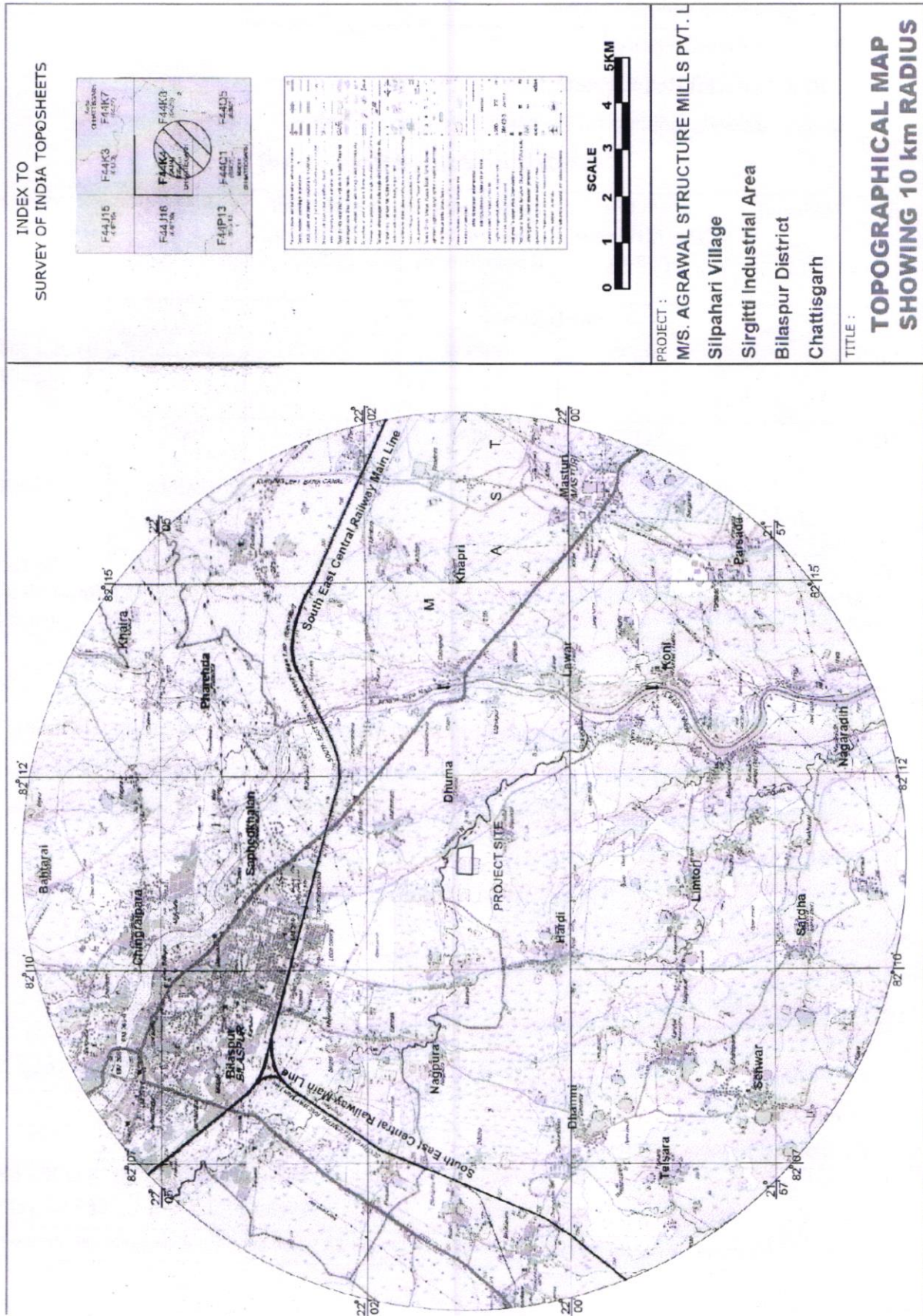
Figure 2: Topographical Map of the Project Site - 10km Radius

2.0 Project Requirements

2.1 Raw Material Requirement

The raw materials required for the project are given in **Table 2**

Table 2: Raw Material Requirement

Sr. No	Raw Material	Existing Requirement (TPA)	Proposed additional Requirement (TPA)	Total After expansion (TPA)	Source	Mode of transportation
For DRI Kilns						
1	Iron ore	60000	108000	168000	Joda-Barbil	By rail and road (through covered trucks)
2	Coal	54180	71820	126000	Indian MCL Mines	By rail and road (through covered trucks)
3.	Dolomite/ Quartzite/ Mn/Lime for DRI	4235	5615	9850	Odisha & CG	By road (through covered trucks)

2.1.1 Water Requirement

The manufacturing process of Sponge does not require water at any stage. The water requirement in the project will be for cooling purpose, domestic consumption, dust mangement and greenbelt development Water requirement for various uses are given in **Table 3.**

Table 3: Water Requirement (KLD)

S. No.	Particulars	Water Demand (KLD)		
		Existing	Proposed	Total
1.	Industrial			
a	DRI	480	180	`660
b	Power Plant	500	1000	1500
2.	Domestic	5	5	10
3.	Plantation and other purposes	30*	35*	35*
Total		**985 (885+100 Recycled)**	**1185 (1020 fresh + 165 recycled)**	**2170 (1905 fresh + 265 recycled)**

Source: - IDC CG water supply system. *Treated water from STP and ETP will be utilized for greenbelt development

Water Balance

305 KLD wastewater will be generated and will be treated in ETP and STP. Treated water will be used inside the plant premises. Zero Liquid Discharge (ZLD) norms will be

followed.

2.1.2 Land Requirement

M/s Agrawal Structure Mills Pvt Ltd proposing the project in Sirgitti industrial area. Toatl land area for the project is 21.86 acres (54.0 Acres), In which 7.56 ha (34.58 %) land allocated for greenbelt dvelopment.

2.1.3 Power Requirement

The existing power requirement is 1.0 and additional 2.0 MW will be required for proposed expansion. The power will be sourced from the WHRB Power Plant..

2.1.4 Man Power Requirement

The skilled/semiskilled /unskilled manpower required for the proposed Project is estimated is 92 no's and the existing Man Power is 66. The manpower required will be fulfilled from the surrounding villages, to help for the improvement of the socio economic status in the surrounding rural areas.

2.2 Technology and Process Description

The Direct Reduced Iron (DRI) plant will comprise of 1x350 TPD kiln and related accessories including Waste Heat Recovery power generating unit. The major plant facilities for the Sponge Iron plant envisaged are as follows:

- Day bins
- Rotary Kiln & Cooler
- Central Control Room
- Product processing and product storage
- Off gas system

The process of DRI plant is given in **Figure 3.0.**

## Waste Heat Recovery Power Plant
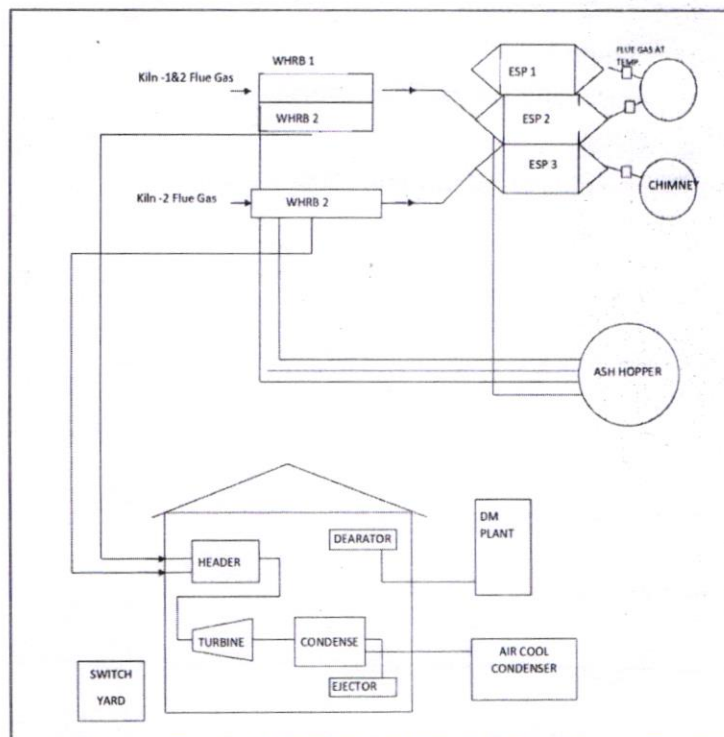
3.0 Baseline Environmental Studies

Baseline environmental studies were conducted in the proposed project area and in the area within 10 km radius from the proposed project area to assess the existing environmental scenario in the area. The baseline environmental quality data for various components of environment, viz. Meteorology, Ambient Air Quality, Water Quality, Noise Levels, Soil Quality, Ecology Biodiversity, Geology & Hydrology, Traffic study and Socio-economic status were monitored during 15th March 2021 to 15th June 2021.

3.1 Meteorology

Site Specific Wind Pattern
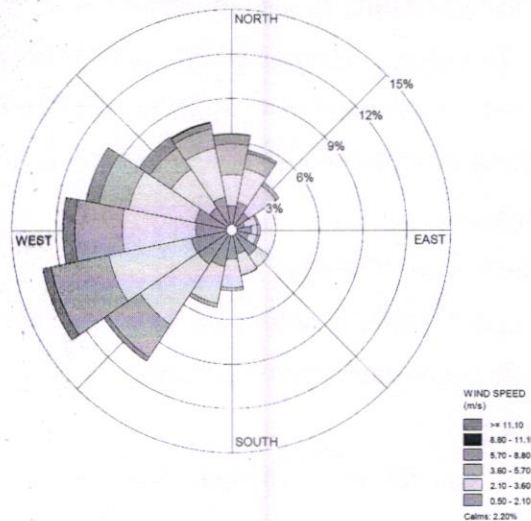
Predominant wind directions during this period were from the WSW (12.7 %) followed by W (12.5%) and WNW direction. The calm condition recorded during study period was 2.20%.

3.2 Ambient Air Quality Status

Ambient air quality of the study area has been assessed through a network of 8 ambient air quality locations. Ambient Air Quality studies were carried out during from 15th March 2021 to 15th June 2021. The significant parameters viz. Particulate Matter 10 (PM10), Particulate Matter 2.5 (PM2.5), Sulphur dioxide (SO2), Oxides of Nitrogen (NOx), and Carbon monoxide (CO) were monitored.

The Minimum and Maximum concentration of PM10 was found in the range of 50.22 to 88.92 µg/m3. The Minimum and Maximum concentration of PM2.5 was found in the

range of 21.18 to 59.88 µg/m3. The Minimum and Maximum concentration of SO2 and NOx were found in the ranges of 9.44 to 14.92 µg/m3 and 14.32 to 28.52 µg/m3.

All the parameters at the sampling locations were found well within the prescribed National Ambient Air Quality standards (NAAQS).

3.3 Ambient Noise Levels

Ambient noise level monitoring was carried out at the 8 monitoring locations. The day time noise levels were monitored during 6 am to 10 pm and night time levels during 10 pm to 6 am at all the locations within 10 km radius of the study area.

The Maximum Noise (day) value was observed 68.5 dB(A) (it's an industrial area) and the minimum noise (day) valve was observed 47.8 dB(A). The Maximum Noise (night) value was observed 60.4 dB(A) (it's an industrial area) and the minimum noise (night) valve was observed 42.6 dB(A).

3.4 Surface and Ground Water Quality

8 ground water samples and 2 surface water samples were collected in 10 km radius study area. Some of the significant parameters are as under:

Ground Water Samples

- Groundwater Samples within 10 km Radius
- pH of the ground water samples collected was in the range of 7.24 – 7.68
- Total Dissolved Solids in the samples was in the range of 470 – 560 mg/l
- Total Hardness was found to vary between 256 – 312 mg/l.
- Chlorides concentration was found to vary between 114 – 188 mg/l.
- Fluoride concentration was found to vary between 0.2 – 0.82 mg/l.
- Sulphates concentration was found to vary between 58.42 – 112 mg/l.
- Heavy metal concentrations in all the samples were found to be well within the limits.

Surface Water Samples

- Water samples from 2 surface water bodies have been collected and analysed as per IS standards.
- pH of the surface water samples collected was in the range of 7.76 – 8.14
- Total dissolved solids in the samples were in the range of 182 – 752 mg/l.
- Total Hardness was found to vary between 209 – 324 mg/l.
- Chlorides concentration was found to vary between 112 – 132 mg/l.
- Heavy metal concentrations in all the samples were found to be well within the limits.

The above ground water quality and surface water quality results are compared with IS 10500 and CPCB Water Quality Criteria. As per these standards these waters can be used for dinking only after convention treatment and sufficient disinfection. These waters can be used for bathing and irrigation purpose.

3.5 Land use Land Cover classification

National Remote sensing Center (NRSC) Resourcesat -2 cloud free data has been used for LULC study. The Land Cover classes and their coverage are summarized in **Table 4**.

Table 4: Land Use Pattern of the Study Area

S. No.	Particulars	Area (Ha.)	Geographical Area (%)
1	Water Bodies/ River/ Canals/ Streams/ Ponds	1329.17	4.24
2	Agricultural Land	11639.89	37.09
3	Fallow Land	7541.87	24.03
4	Plantation	3324.48	10.59
5	Builtup Land	4086.53	13.02
6	Open/Waste/Scrub Lands	2867.87	9.14
7	Project Site	21.85	0.07
8	Road	460.21	1.45
9	Railway Track	135.345	0.37
	TOTAL	**31407.215**	**100.00**

Observation of Land Use / Land Cover Study

- The study area mainly comprises of Agriculture land, which constitutes 37.09 % of the total area and Open Scrub / wasteland, which comprises of 9.13 % of total area. Plantation constitutes 10.59 % of the total area and Built-up area comprises of 13.02 % of the total area
- There are no Ecological Sensitive Areas (National Park, Wildlife Sanctuary, Biosphere Reserve etc.) within 10 km radius of the study area.

3.6 Soil Quality

The soil samples were collected from 8 sampling locations within an area of 10 km radius around the proposed project for analysis of the physico-chemical characteristics of the soil quality. The following are the highlights of soil quality in the study area:

- pH of the soil samples was found to be in the range of 7.62 – 7.8.
- Soils in the area were found to be sandy silty clay in texture with sand percentage in the range between 9.34– 66.24 %, silt between 18.54 – 28.32 % and Clay 13.42 – 66.32 %.
- Nitrogen content is ranging between 0.07 to 3.28 % thereby indicating that soils are Low to medium in Nitrogen.
- Phosphate content is ranging between 29.8 to 38.52 kg/ha thereby indicating that soils are high in Phosphates.
- Potassium content is ranging between 40.2 to 162 kg/ha thereby indicating that soils are low to Medium in Potassium.

3.7 Biological Environment

Ecological survey covering an area of 10 km radius from the proposed project boundary was done for generation of primary data to understand baseline ecological status, important flora, fauna and collection of secondary data from Forest Working Plan.

The areas include few villages comprising of agricultural land, scrub land, and barren land where most of the vegetation is aggregated on agricultural bunds, nearby human settlements, road sides, railway lines and forest area if available. The study area around the proposed site comprises of terrestrial ecosystem. Crops in the study area are noticed Paddy, Maize, Groundnut, Bajara, Cotton, and pluses etc.

Core zone is part of Industrial zone and is surrounded by industries, croplands and waste lands. Land-use land-cover of the study area reveals the absence of any National Park or Wild Life Sanctuaries or Important Bird Areas.

3.8 Socio-economic Environment

Information on socio-demographic status and the trends of the communities in the 10 km radius, was collected through primary social survey and secondary data from census 2011 & village directory 2011.

The significant demographic features of area are:

Particulars	10 km Radius (Study Area)
No. of Households	226689
Male Population	535922
Female Population	514286
Total Population	1050208
Average Household Size	4.6
Male %	51.03 %
Female%	48.97 %
Schedule caste	202907
% To the total population	19.3 %
Schedule Tribes	90816
% To the total population	8.6 %
Total SC and ST population	293723
% To total population	27.9 %
Other caste population	756485
% To total population	72.1 %
Main Worker	304195 (29.0%)
Marginal Worker	104737 (9.97%)
Other Worker	641276 (61.03%)

4.0 Environmental Impacts & Mitigation Measures

4.1 Air Pollution

The major air emissions from the proposed project, which will have the impact on the surrounding is mainly from the Submerged Arc Furnace section where the dust is released through flue gases to the atmosphere.

AERMOD regulatory model recommended by United States Environmental Protection Agency (USEPA) has been used for predicting the incremental concentrations of PM, SO_2 and NOx form the proposed plant activities. The incremental details and resultant details are given in **Table 5**

Table 5: Cumulative Scenarios within Study Area

24 Hourly Concentrations	Particulate Matter (PM10) ($\mu g/m3$)	SO2 ($\mu g/m3$)	Oxides of Nitrogen (NOx) ($\mu g/m3$)
Baseline Scenario (Max)	89.71	14.92	28.52
Incremental GLC through Process	1.8	0.65	9.27
Overall GLC	91.51	15.57	37.79
NAAQ Standards	100	80	80

Results Shows that after operation of full load the emission level of the surrounding area will be within prescribed Norms.

Mitigation measures:

i.   Stack height would be 30 m and 45 m (additional 1.0 nos.) for gaseous emission confirming to the CPCB norms. D. G. Sets, stack height of 3.0 m above the roof level will be maintained.

ii. ESP will be installed to control the particulate matter emission below 30 mg/Nm^3.

iii. Ambient air quality and stack emission would be regularly monitored and effective control exercised, so as to keep limits on stack emission loads would be met below the defined Norms.

iv. Automatic system will be installed to shut down the plant during failure of APC System. APC performance will be conducted regular Intervals.

v.   In order to avoid fugitive emissions from different sources, water will be sprayed. Also the roads within the premises will be concreted and Vacuum cleaning will be done to prevent dust emission.

vi. The ambient air monitoring will be carried out regularly in the work zone and surrounding areas, to check that ambient air levels of the contaminants, are well below the stipulated norms.

vii. Green belt around the periphery and within premises will be developed which will help in attenuating the pollutants emitted by the plant.

viii. Water sprinklers will be installed to control the fugitive emissions.

4.2 Water Quality Management

The Total water requirement after expansion will be 2170 KLD and Fresh water requirement of the proposed plant will be 1905 KLD. The water will be mainly used for cooling purpose, Power plant, greenbelt, dust suppression and domestic purpose only. About 350 KLD waste will be generating and will be treated in ETP. Cooling water will be continuously recalculated in the cooling circuit, domestic effluent (8.0 KLD) will be treated in STP, and treated wastewater will be reused for greenbelt development. The water for other areas i.e. for greenbelt, dust suppression and domestic use is supplied directly. However, the Plant will be designed for Zero Discharge from the operations.

4.3 Noise Pollution Control

Various components of industrial operations will cause some amount of noise, which will be controlled by proper maintenance and compact technology.

- Time to time oiling and servicing of machineries will be done.
- Acoustic enclosure for Turbine and D.G. sets will be provided.

- Greenbelt development (plantation of dense trees across the boundary) will help in reducing noise levels in the plant as a result of attenuation of noise generated due to plant operations, and transportation.

4.4 Greenbelt Development and Plantation

Greenbelt will be developed within the plant premises covering a total area of about 7.56ha (34.58 %) of total Plant area. The plantation work for greenbelt development will be carried out as per CPCB guidelines, native species would be preferred.

4.5 Solid Waste and Industrial waste Generation

The details of solid waste generation and its management are given in **Table 6.**

Table 5: Solid Waste and Industrial Waste Generation and Disposal

Particulars		Waste Quantity in TPA			Treatment/ disposal
	Type of Waste	Existing	Proposed	Total	
Process	Coal Char	16,000	29000	45,000	Total Char shall be sold to power plant
	Accretion material	145	262	407	Sold for road construction activity
Municipal Solid Waste (Kg/ day)	Organic solid waste : 60 % of the total waste	7.92	11.04	18.96	Sent to Municipal Council Bilaspur CG
	Inorganic solid waste : 40 % of the total waste	5.28	7.36	12.64	
STP	STP Sludge	-	2 Kg/day	2kg/day	Used as manure in greenbelt development
Used oil		1.0 KL/Annum	1.0 KL/Annum	2.0 KL/Annum	Sold to authorized recycler

5.0 Project Benefits

- The skilled/semiskilled manpower required for the proposed project is estimated is 158 no's. Preference will be given to local people for employment during construction phase as well as operation phase considering their skills and capability.

- This project will improve the overall physical infrastructure in this area. Rain water harvesting will be done for groundwater recharging that will improve the ground water table in the area.

- **Agrawal Structure Mills Pvt Ltd**shall maintain the roads in good conditions so that the road connectivity will improve for transport, villagers will be benefitted.

- Welfare activities such as organizing medical check-up camps and extending medical facilities to local population will be undertaken regularly.

- CER activities and the local employment can fill the gap and enhance the satisfaction of the people also it will reduce the impact or it will be compensate to the adverse impact.

- Training will improve the workers efficiency also it will enhance the numbers of trained worker and the quality of work.

6.0 EMP Details

Budget for implementation of environment management plan are given in **Table 6**.

Table 6: EMP Budget

S. No	Item	Capital Cost (Rs. Lakhs)	Recurring Cost per annum (Rs. Lakhs)	Time Frame
1	Air Pollution Control • ESP& Bag Filters • Dust Management System • Online Monitoring System (AAQMS & CEMS) • Stacks (1 Nos)	250 50 50 40	20.0	Within 1 Year
2	Water Pollution Control • STP • Rain Water Harvesting • Drainage	30 25 20	10.0	Within 6 Months
3	Noise Pollution Control	20	5.0	Within 1 Year
4	Solid waste Management	30	10.0	Within 1 Year
5	Environment Monitoring and Management	20	16.5	Within 6 Months
6	Occupational Health	10	7.0	Ongoing
7	Greenbelt	15	3.0	Within 1 Year
8	Social Activity	30	5.0	Within 6 to 12 months
	Total	590	76.5	

7.0 Conclusion

There will be no significant impact on the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Regular monitoring of

all the components of environment, adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Greenbelt development around the area will also be taken up as an effective pollution mitigation measure, as well as to control the pollutants released from the premises of the project. Increased social welfare measures taken by the company will lead to development in the nearby villages. The proposed Expansion project will be beneficial to the local people as more infrastructure development, improvement in education and health facilities, roads, etc. in near-by villages will be done.

Proposed expansion of existing Sponge Iron Plant by installation of 1 x 350 TPD DRI kilns along with expansion of CPP (WHRB) from 4 MW to 12 MW at Silpahari, Sirgitti Industrial Area, Bilaspur (C.G.) by M/s Agrawal Structure Mills Pvt Ltd.

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