

EXECUTIVE SUMMARY

FOR

PROPOSED INSTALLATION OF INDUCTION FURNACES WITH CCM TO PRODUCE 363000 TPA MS INGOT/BILLETS AND/OR 350000 TPA ROLLED STEEL PRODUCT THROUGH HOT CHARGING ROLLING MILL

at Village: Sarora, Block: Dharsiwa, Tehsil and District: Raipur, C.G.-493221

Terms of Reference No.669 /INDUSTRIES/RAIPUR/1639 dated 28/6/2021

Category B1, Schedule 3 (a) Metallurgical industries

Baseline period: Post Monsoon Season Nov to Jan 2018-19 (1.11.2018 to 31.1.2019)

PROJECT PROPONENT



M/s. Maa Kudargarhi Power and Ispat Private Limited

ENVIRONMENTAL CONSULTANT



M/s Anacon Laboratories Pvt. Ltd., Nagpur

QCI-NABET Accredited EIA Consultant for Metallurgical Industries (Sector 8 3(a))

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Proposed installation of Induction Furnaces with CCM to produce 363000 TPA MS Ingot/Billets and/or 350000 TPA Rolled Steel product through Hot Charging Rolling Mill at Village: Sarora, Block: Dharsiwa, Tehsil and District: Raipur, C.G.-493221 by **M/s. Maa Kudargarhi Power and Ispat Private Limited**



1.0 INTRODUCTION

M/s. Maa Kudargarhi Power and Ispat Private Limited (hereafter referred as MKPIPL) has proposed to install 4 Nos Induction furnaces 25 Tons Capacity each with CCM 25 Tons x 4 Nos. in order to achieve better energy efficiency in the melting furnaces. Thus, MKPIPL will be able to produce 363000 TPA MS Ingot/Billets and/or 350000 TPA Rolled Steel product through Hot Charging Rolling Mill.

As per Environmental Impact Assessment Notification dated 14th September, 2006 and subsequent amendment thereof. The proposed project falls under “Category B1”, Schedule 3 (a) and requires Environmental Clearance (EC) to be obtained from SEAC/SEIAA, Chhattisgarh.

Anacon Laboratories Pvt. Ltd., Nagpur, is QCI-NABET accredited in ‘Category A’ environment consultant organization has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed green-field project.

The online application for prior Environmental Clearance (Form-1 and PFR) was submitted to SEIAA/SEAC Chhattisgarh, proposal no. SIA/CG/IND/62840/2021, on Dated 22 April 2021 Implementation of Greenfield Induction Furnaces with CCM to produce 363000 TPA MS Ingot/Billets and/or 350000 TPA Rolled Steel product through Hot Charging Rolling Mill. The proposal was considered by the State Expert Appraisal Committee (SEAC) Chhattisgarh during 372 meeting held on 29/5/2021. The committee has approved the Standard Terms of Reference with specific and additional conditions, No. 669/INDUSTRIES/RAIPUR/1639 dated 28/06/2021 for the purpose of preparing environment impact assessment report and environment management plan for obtaining prior environment clearance is prescribed with public consultation.

Environmental baseline studies were carried out during in Nov to Jan 2018-19 (1.11.2018 to 31.1.2019). This EIA report is prepared based on the ToR conditions recommended by SEAC, Chhattisgarh and project related technical details provided by M/s. MKPIPL. A copy of the TOR letter is enclosed as **Annexure-I** and its compliance with cross referencing provided in the beginning of the chapter scheme.

1.1 IDENTIFICATION OF PROJECT

M/s. Maa Kudargarhi Power and Ispat Private Limited, for Implementation of Greenfield Induction Furnaces with CCM to produce 363000 TPA MS Ingot/Billets and/or 350000 TPA Rolled Steel product through Hot Charging Rolling Mill at Village –Sarora, Tehsil and District Raipur- 493111 CG.

1.2 LOCATION OF THE PROJECT

Plant is located at, Khasra No. 217/1, 247/9(Part), 253 (Part), 262/2(Part), Village Sarora, Tehsil and District Raipur of Chhattisgarh (**Annexure III** land documents). The project site lies at the Latitude: 21°17'40.84"N: Longitude 81°36'9.36"E on the Topo sheet No. No.64 G/11, 12 (New No. F44P11, F44P12).

1.3 EIA/EMP REPORT

In line with the approved ToR obtained from SEAC, Chhattisgarh, baseline environmental monitoring was carried out during Post monsoon season (Nov-Dec 2018 to Jan 2019) for determining the status of ambient air quality, ambient noise levels, surface and groundwater quality, soil quality, status of flora, fauna and eco-sensitive areas and socio-economic status of the villages within 10 km radius



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study area from the project site. **(Figure1)**. The observations of the studies are incorporated in the draft EIA/EMP report. Impacts of the proposed project activities during construction and operation stages were identified and duly addressed in the draft.

EIA/EMP report along-with the proposed management plan to control/ mitigate the impacts. Environmental Management Plan is suggested to implement the pollution control in the project.

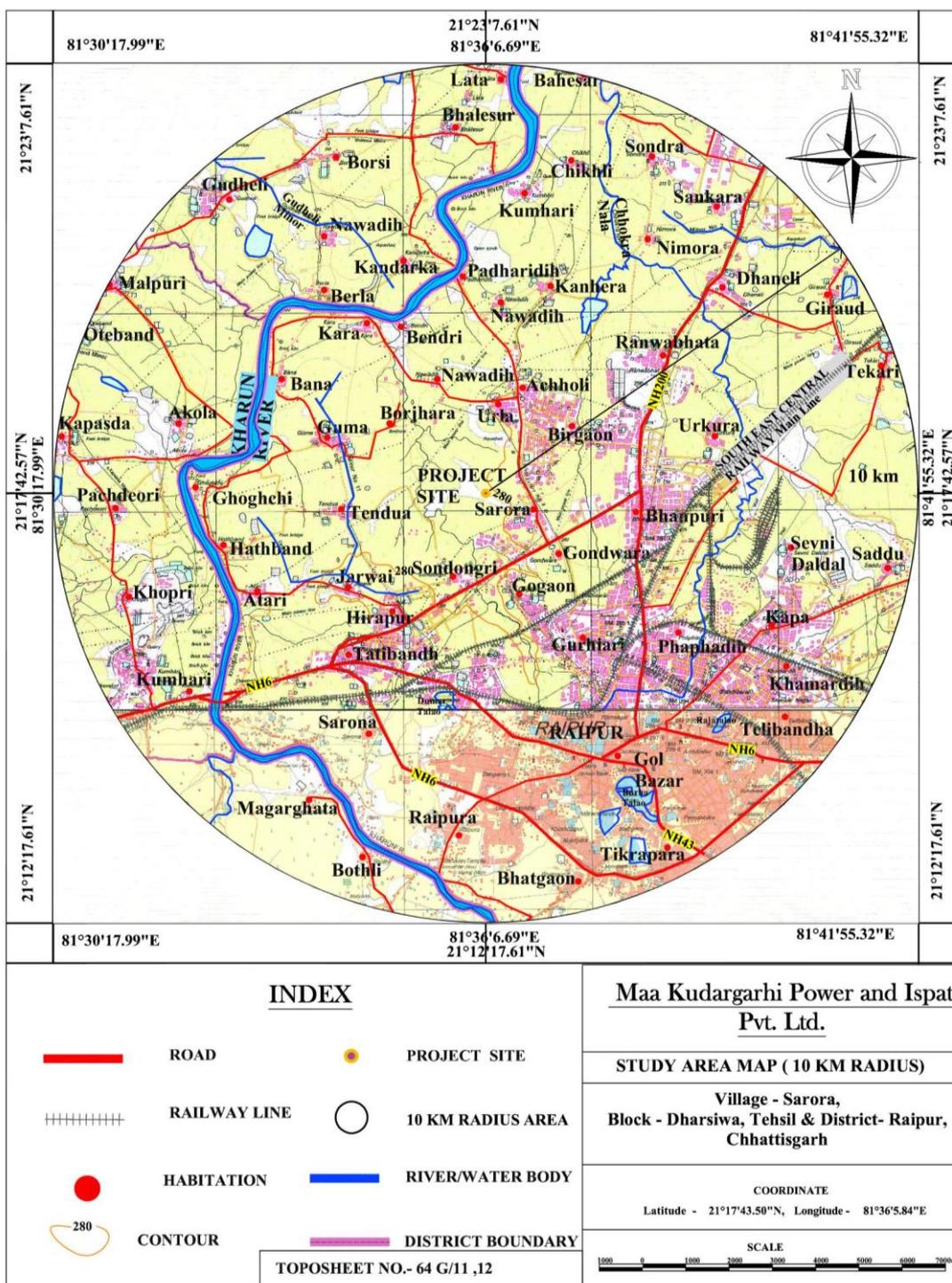


FIGURE 1: STUDY AREA (10 KM RADIAL DISTANCE)



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**TABLE 1
DETAILS OF ENVIRONMENTAL SETTINGS**

Sr. No.	Particulars	Details
1.	Project Location	Village Sarora, Tehsil and District Raipur of Chhattisgarh 493111
2.	Khasra No.	217/1, 247/9(Part), 253 (Part), 262/2(Part)
3.	Co ordinate	Latitude: 21°17'37.81" N- 21°17'48.69" N: Longitude: 81°35'59.03" E 81°36'13.88" E
4.	Toposheet No.	64 G/11, 12 (New No. F44 P11, F44P12)
5.	Climatic Conditions	Mean annual rainfall is 1252.8 mm Temperature : Pre monsoon 20.6° C (Min.) 41.7° C (Max.) : Winter 13.3° C (Min.) 31.0° C (Max) : Post monsoon 17.3° C (Min.) 31.8° C (Max.) Source: IMD, Raipur
6.	Nearest IMD station	IMD Raipur – 19 km in SE
7.	Land Form, land Use and Ownership	land is diverted to industrial use
8.	Site topography	Elevation of plot area: 280 m to 283 m; Flat Terrain
9.	Nearest roadway	National Highway No. 200 – 3.6 km (E) Ring Road 2 – 2.00 km (SE) NH6 - 2.4 Km, ESE NH43 - 4.7 Km , SSW
10.	Nearest Railway Station	WRS Colony 4.2 KM (ESE) Raipur JN Railway Station 5.0 KM (SE) Urkura – 4.7 Km , ESE
11.	Nearest Air Port	Swami Vivekanand International Airport – 19.0 km (SE)
12.	Nearest Port	NA
13.	Nearest lake	NA
14.	Nearest State/National Boundaries	Madhya Pradesh – 92 km (W) Maharashtra – 96 km (WSW) Odisha – 90 km (ESE)
15.	Nearest major city with 2,00,000 population	Nearest city – Raipur – 5.0 km (SE)
16.	Nearest village	Sarora – 1.0 Km, SE
17.	Villages within 1 km radius	Sarora – 1.0 Km, SE Birgaon - 1.0 Km ENE
18.	Distance for sea coast	NA
19.	Hills/valleys	NA
20.	Nearest Reserved/ Protected forests	None
21.	Archaeologically important places	None
22.	Protected areas as per Wildlife Protection Act,1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	None
23.	Nearest water bodies	Kharun River – 5.2 Km. W Chhokra Nala – 5.9 Km , ENE Dumar Talao – 4.8 Km, SSW



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Sr. No.	Particulars	Details			
		Burha Talao – 7.5 Km, SSE Rata Talao - 7.7 Km , SE			
24.	Nearest industries (in km)	Sr. No.	Industries Name	Dis (Km)	Dir
		1	Bajrang Industries	0.6	ESE
		2	Mahavir Iron & Steel Industries	0.9	SE
		3	Bharat Agro Industries	1.1	ESE
		4	R V Pack Industries	1.3	ESE
		5	Hind Pipe Industries	1.2	ESE
		6	B.J. Industries	1.1	SE
		7	Ganpati Ispat Pvt. Ltd.	0.8	SSW
		8	Vithal Industries	1.1	S
		9	JMD Industries	1.3	S
		10	Mahamaya Steel Industries Ltd.	0.5	NE
		11	Jayaswal Neco Industries Ltd.	8.7	SSE
		12	Mahendra Strips (P) Ltd.	8.8	NE
		13	Goyal Energy & Steel (P) Ltd.	5	WSW
		14	Dunlop Tarpaulin Industries	5.3	SW
		15	Vishvkarma Steel Industries	5.6	SW
		16	Traansrect Industries	5.7	WSW
		17	Makknow Industries	5.8	SSE
		18	R.R. Industries Corporation (India) Ltd.	5.2	SSE
		19	Swati Industries (Fiber Product)	5.3	SE
		20	Siddhart Industries	3.8	ENE
		21	Rawabhata Industrial Area	4.7	NE
25.	Seismic zone	The proposed project site falls in zone-II as per IS 1893 (Part-I): 2002. Hence, seismically, it is a stable zone.			

2.0 PROJECT DESCRIPTION

2.1 PROCESS DESCRIPTION

2.1.1 Details of Manufacturing Process of Steel Melting Shop (Induction Furnace) with CCM

The manufacturing process propose for the unit is well established and proven technology presently being followed by majority of similar manufacturing units mostly in small or medium scale sector.

In order to achieve high energy efficiency four numbers of Induction Furnaces (25 Ton x 4 Nos.) with medium power input capacity each have been setup with completely automatic charging facility. Electronic software has been installed to monitor the input power and maintaining power factor to almost unity level. The melting process involves taking sample of Sponge Iron & Pig Iron; Iron Powder and mild steel scrap, end cutting from rolling mills or scrap from user units is taken from raw material storage. This is than tested for its chemical composition and noted. Before preparation of charge necessary ingredients like Ferro Manganese, Ferro Silicon etc. are added by weight, Flux is taken up in crucible and then charge is put into it. Melting of steel along with other alloying element is accomplished in the crucible of coreless M.F. Induction Furnace. The high A.C. Current is passed through the copper oil wrapped around the outer periphery of crucible. By transformer action the A.C. Current induces much higher secondary current at 1000 hertz in the charge fed into crucible through the coil. Enormous heat it thus developed by resistance which causes the melting of charge. As soon as the molten pool is formed very pronounced stirring action in the molten metal takes place which helps in accelerating the melting. Deoxidizing agents and sometimes specific alloying elements are also added at suitable intervals during melting. Melting of homogenous mass occurs at 1600 C. If



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necessary superheating up to 1650 C as done for specific time. After completion of melting cycle of an hour the homogeneous molten mass is poured hydraulically into the ladle.

CCM:

The ladle containing liquid steel is placed on the CCM platform and continuous casting of hot billet is carried out in the same.

Hot Charging Rolling Mill

At this point the billet is cut to the desired length and is either set aside to cool down or sent directly to the mill in what is known as the “Hot Charging” process.

By sending the billets straight to the mill without letting it get too cold cuts down on a great deal of fossil fuel burning. In the mill the billet is rolled to the desired shape, such as wire rod, structural steel like angles, channels or beams, or into rebar for which the hot solidified steel will then need to be quenched in a TMT box to give it its physical characteristics.

2.2 LAND REQUIREMENT

The land located) at khasara No. 217/1, 247/9(Part), 253 (Part), 262/2(Part) PH No. 89, Village-Sarora, Tahsil and District Raipur (CG total measuring about 5.08 Hectare).

The promoters have obtained NOC from the current land owners for seeking EC from MOEFCC and execution of land transfer sale deed will be executed immediately after grant of EC. The current owner has issued in principal consent for the same.

**TABLE 2
LAND UTILIZATION**

S. NO.	Land Use	Area (SQM)	Area (In %)
1	Builtup Area	10410	20.49%
2	Area under Road and Paved	3500	6.89%
3	Area under Green Belt	20325	40%
4	Open Area	16577	32.62%
	Total:	50812	100

2.3 RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

The raw material will be transported through truck. It is estimated that approx. 240 trucks/day required for transportation of raw materials and finished products of the plant.

**TABLE 3
RAW MATERIALS REQUIREMENT**

Raw Materials Requirement for Induction Furnace Division		
Raw materials	Total quantity required (TPA)	Mode of Transportation
Sponge Iron	341052.00	By road through covered trucks from market
Cl/Pig Iron/ Heavy Melting Scrap	75594.00	
Ferro Alloy and Almn.	3667.00	
Ramming Mass	726.00	
Total :	421039.00	
Raw Materials Requirement for Hot Charging Rolling Mill		
Raw materials	Total quantity required (TPA)	Mode of Transportation



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Raw Materials Requirement for Induction Furnace Division		
Raw materials	Total quantity required (TPA)	Mode of Transportation
Hot Billet	363000.00	Internal transfer from own induction furnaces and CCM

2.3.1 Solid and Hazardous waste generation

Total Solid wastes generation through process is estimated to be about 57170 TPA which includes Defective Billet, Miss Cast and End Cutting about 3630 TPA, Slag 40927 TPA, Mill scale 5250 TPA, miss rolls 7000 TPA and Refractory Waste 363 TPA. Waste oil/used oil will be 3 KL/Yr which are classified as hazardous waste.

2.4 WATER REQUIREMENT & SOURCE

For proposed project total 343 KLD water will be required out of which 326 KLD water will be required for cooling purpose and 17 KLD water will be required for Domestic purpose. The water will be sourced from surface water.

Industrial Water requirement will be fulfilled through surface water from Kharun river. Application form for sanction of allotment of water by Water Resources Department provided in **Annexure IV**.

The water is only used in cooling purpose in process. The cooling will be done in closed circuit cooling system to achieve better utilization of water. No industrial effluent will be generated.

2.5 POWER REQUIREMENT & SUPPLY

For proposed project 37 MW power will be required, which will be sourced through CSPDCL power supply network. 500 KVA X3 Nos DG sets will be installed as emergency backup.

2.6 MANPOWER REQUIREMENT

For proposed project total 356 manpower will be required out of which 26 people be required for administrative staff and 330 people will be required as production staff.

2.7 FIRE FIGHTING FACILITIES

In order to combat any occurrence of fire in plant premises, fire protection facilities will be envisaged for the various units of the plant. All plant units, office buildings, laboratories, etc. will be provided with adequate number of portable fire extinguishers to be used as first aid fire appliances.

2.8 PROJECT COST

The project cost for proposed plant is estimated as Rs. 9200.00 Lakhs.

3.0 DESCRIPTION OF ENVIRONMENT

3.1 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were conducted at project site along with 10 km radial distance from the project site. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, Land were monitored during Post monsoon season (**November 2018 to January 2019**).



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3.2 METEOROLOGY & AMBIENT AIR QUALITY

Summary of the Meteorological Data Generated At Site (Nov. 2018 to Jan. 2019)

Particular	Predominant Wind Direction Post monsoon season
First Predominant Wind Direction	ENE (21%)
Second Predominant Wind Direction	NE (20%)
Calm conditions (%)	0.46
Temperature (°C)	11-33

The status of ambient air quality within the study area was monitored for post-monsoon season for at 8 locations covering project site, Sarora, Birgaon, Urla, Bana, Tendua, Sondongri, Urkura villages. Total 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind, cross wind directions and reference point. The levels of Respirable Particulate Matter (PM₁₀), Fine Particulates (PM_{2.5}), Sulphur Dioxide (SO₂), Oxides of Nitrogen (NO_x) and carbon monoxide (CO), Ammonia, Ozone, Benzene and BAP were monitored. The details of Ambient Air Quality Monitoring Results are summarized in **Table 3.2.5**.

Concentration levels of PM₁₀, PM_{2.5}, SO₂ and NO_x were monitored at eight locations in the upwind, downwind and crosswind directions of site and found that maximum concentration of PM₁₀ is 141.8 µg/m³ recorded at Sarora site and minimum is 45.5 µg/m³ recorded at Bana. The concentration of PM_{2.5} vary from 12.1-45.6 µg/m³. SO₂ concentration level ranged from 5.1-24.7 µg/m³ and NO₂ concentration ranged from 9.3-33.4 µg/m³, CO concentration ranged from 0.115 -0.492 mg/m³, concentration range of Ozone vary 7.1 to 18.6 µg/m³ and NH₃ concentration ranged from 5.5-16.9µg/m³ in the study area. Heavy metals were estimated (As, Pb, Ni) from PM₁₀ to know the concentration levels in particulate matter and observed that, lead was found to be below detection limit.

From the above results, it is observed that the ambient air quality at all the monitoring locations except PM₁₀ value at Sarora and Urla (Max. 141.8 µg/m³, 100.7 µg/m³ respectively) was within the permissible limits specified by CPCB.

One month ambient air monitoring has been carried out at two locations (Khopri & Sarona) as per suggestion of SEAC during ToR presentation and reports are presented in **Annexure VI (a)**.

3.3 AMBIENT NOISE LEVELS

Ambient noise level monitoring was carried out at the 08 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 4**.

**TABLE 4
SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS**

Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq _{Day}	Leq _{Night}
Residential Area			
1.	Sondongri	54.1	43.6
2.	Gogaon	52.5	41.4
3.	Gondwara	52.3	40.2
CPCB Standards dB(A)		55.0	45.0
Commercial Area			
4.	Tendua	54.1	43.8
CPCB Standards dB(A)		65.0	55.0
Silence Zone			



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Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq _{Day}	Leq _{Night}
5.	Birgaon	48.3	39.7
CPCB Standards dB(A)		50.0	40.0
Industrial Area			
6.	Project Site	71.3	55.2
7.	Sarora	62.1	51.3
8.	Urla	64.1	55.1
CPCB Standards dB(A)		75.0	70.0

Source: Field monitoring and analysis by Anacon Laboratories Pvt. Ltd., Nagpur

3.4 SURFACE AND GROUND WATER RESOURCES & QUALITY

3.4.1 Local Geology

The lithology in 10 km study area mainly consists of Laterites of quaternary age and limestone and Sandstone of Proterozoic age. The study area around the project site does not have major faults or shear zone.

3.4.2 Local Hydrogeology and Aquifer Systems

Hard rock mainly consist of limestone, shale, dolomite and sandstone belong to Chhattisgarh Super group of Proterozoic age. Ground water occurs in phreatic condition in the weathered mantle of these rocks, which extends up to a depth of 25 mbgl. The caverns formed in limestone and dolomites holds good amount of ground water which are limited mostly to around 80 meters. Limestone and dolomite form the main aquifer system in the area. Charmuria limestone and Gunderdehi shale are not very good yielding. Cavernous limestone of Chandi formation forms the good aquifer in the district. The alluvium blanket along the major rivers also form good repository of ground water. In study area ground water level in Pre-monsoon season ranges from 10-11 mbgl and in Post-monsoon season ranges from 0.75-3.0 mbgl (As per CGWA data).

3.4.3 Geomorphology

Geomorphologically the district is having matured type of land forms and can be broadly divided into two prominent geomorphic units. These are

1. Dissected Pediplain made by Proterozoic shale- limestone dolomite area.
2. Alluvial Plain formed by Seonath-Mahanadi Alluvium.

The Central Chhattisgarh Plain is represented by Structural Plain on Proterozoic rocks which cover the study area. They are having gently sloping erosion surfaces and thin to moderate cover of soil. Topography of the surrounding area is flat and no major geomorphic feature is present.

3.4.4 Water Quality

Groundwater and surface water quality was assessed by identifying 8 groundwater (Borewell/ handpump) locations in different villages and 4 surface water samples.

A. Groundwater Quality

The analysis results indicate that the pH ranged between 6.98 – 7.98. The TDS was ranging from 230-510 mg/l. Total hardness was found to be in the range of 118-364 mg/l. The fluoride concentration was found in the range of 0.21 – 0.93 mg/l. The nitrate and sulphate were found in the range of 12.39 – 29.74 mg/l and 18.91 – 52.98 mg/l respectively. Heavy



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metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Mn, Zn and Hg) were found to be below detection limit and within specified standards.

Sr. No.	Locations	WQI	Quality	Remark
1	Project Site	62.76	Good	Water quality assessed based upon above physico-chemical parameters and samples are physico-chemically excellent to good range.
2	Sarora	49.26	Excellent	
3	Tendua	41.90	Excellent	
4	Sarona	53.74	Good	
5	Akola	42.73	Excellent	
6	Borjhara	46.44	Excellent	
7	Nawadih	58.69	Good	
8	Nimora	43.64	Excellent	

B. Surface Water Quality

The analysis results indicate that the pH ranged between 7.69 - 7.98 which is well within the specified standard of 6.5 to 8.5. pH is a measure of the hydrogen ion concentration of the water. The pH of water indicates whether the water is acid or alkaline. The TDS was observed to be 218 - 558 mg/l which is within the permissible limit of 2000 mg/l. The total hardness recorded was in the range of 86 - 186 mg/l as CaCO₃ which is also within the permissible limit of 600 mg/l. The levels of chloride and sulphate were found to be in the range of 22.09 - 28.41 mg/l and 15.63 - 33.72 mg/l respectively.

C. Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water. Bacteriologically, all surface water samples were contaminated and water treatment followed by chlorination or disinfection treatment is needed before use for domestic purpose whereas groundwater samples were not bacteriologically contaminated.

3.5 LAND USE LAND COVER CLASSIFICATION

The land-use & land cover map of the 10 km radial study area from the periphery of project site has been prepared using Resource SAT-1 (IRS-P6), sensor- LISS-3 having 23.5 m spatial resolution and date of pass 27 Nov 2018 satellite image with reference to Google Earth data and the Cartosat-I data having 2.5 m spatial resolution and date of pass Jan 2017. These were later verified by using SOI toposheet, Google Earth imagery and Ground truthing by GPS survey. Polygon layers for each class were digitized and the respective areas were calculated. The Land Cover classes and their coverage are summarized in **Table 5**.

TABLE 5
LU/LC CLASSES AND THEIR COVERAGE IN SQ. KM OF 10 KM RADIUS

Sr. No.	LU/LC Class	Area (Sq.Km)	Percentage (%)
1	Built up Land Rural/Urban)		
	Settlement	52.63	16.76
	Industrial Settlement	48.94	15.59
	Road Infrastructure	9.54	3.04
	Railway Infrastructure	6.85	2.18
2	Agriculture Land		
	Cropland	124.88	39.77
	Barren Land	10.86	3.46
	Play Ground	2.43	0.77
3	Water bodies		
	River/Nala/Stream	9.88	3.15



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Sr. No.	LU/LC Class	Area (Sq.Km)	Percentage (%)
	Pond/Tank	2.92	0.93
4	Scrub/Waste Land		
	Land with scrub/Open Scrub	40.96	13.04
5	Mining/Stone Quarry	1.24	0.39
	Brick Kline area	2.87	0.91
	Total	314.00	100.00

3.6 SOIL QUALITY

For studying soil quality of the region, sampling locations were selected to assess the existing soil conditions in and around the proposed project site representing various land use conditions. The physical, chemical properties and heavy metals concentrations were determined. The samples were collected by ramming a core-cutter into the soil up to a depth of 30 cm. Total 8 samples within the study area were collected and analyzed.

From the analysis results of the soil samples, it was observed the bulk density of the soil in the study area ranged between 1.505- 1.692 g/cc which indicates favorable physical condition for plant growth. The water holding capacity is between **19.16 – 34.35 %**. Infiltration rate, in the soil is in the range of **15.99 - 25.43 mm/hr**. The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from **9.38 – 29.31 mg/Kg** and **11.46 - 17.93 mg/Kg** respectively. Chloride is in the range of **20.62 – 23.88 mg/Kg**. Organic matter and nitrogen were found in the range of **1.07 – 1.38 %** and **54.84 – 63.27 kg/ha**.

3.7 BIOLOGICAL ENVIRONMENT

Floral composition in Study Area

Floral characteristics within project site and surrounding areas including various villages were studied during post-monsoon season. Total 111 floral species were observed in the study area. The details about the floral composition are as follows.

- Trees:** Total 62 species were found in the study area
- Shrubs (small trees):** Total 24 species were enumerated from the study area.
- Herbs:** In the study area 13 species were observed.
- Bamboo & Grasses:** 07 species were enlisted from the study area
- Climbers and Twiners:** Total 04 species of climbers/ twiners were recorded in the study area.
- Parasite :** Each 1 species enlisted in the area

Fauna in the Study area:

Among mammals; *Canis aureus* (Jackal), Common Langur, *Herpestes edwardsi* (Common Mongoose), *Vulpes bengalensis* (Indian fox), are protected in schedule –II. whereas, *Lepus nigricollis* (Black-naped hare), *Funambulus pinnati* (Palm squirrel) protected in Schedule IV and Rats protected in Schedule V

Among the Herpetofauna, Indian Cobra (*Naja naja*), and Common Rat Snake (*Ptyas mucosa*) were provided protection as per Schedule-II of Wild life protection act, (1972) and Common Indian Krait (*Bungarus caeruleus*), Indian Toad (*Bufo parietalis*) were provided as per Schedule – IV of Wildlife protection act 1972 and as amended.



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Among the Avifauna: All birds were observed in the study are included in schedule IV as per wildlife protection act.

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 collection from census 2011 & District Census hand book 2011. Summary of the socio-economic status of the study area is given in **Table 6**. Details regarding Infrastructure facilities evaluation 2011 are presented in **Table 7** respectively.

**TABLE 6
SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES
WITHIN 10 KM RADIUS AREA**

No. of villages	34
No of Towns	1
Total households	13348
Total population	66873
Male Population	33932
Female population	32941
SC Population	9392
ST Population	1832
Total literates	42169
Total Illiterates	24704
Total workers	28015
Total main workers	21310
Total marginal workers	6705
Total non-workers	38858

Source: Primary census abstract 2011, District Raipur and Durg, State Chhattisgarh

**TABLE 7
INFRASTRUCTURE FACILITIES IN THE STUDY AREA**

Yr. 2011	In percentage (%)									
	Educating	Drink ing water	Road	Po wer	Recre ation	Transpo rtation	Medical	Commu nication	Social Security	Drain age
Availability	97	100	100	100	91	82	50	65	21	53
Not Availability	3	0	0	0	9	18	50	35	79	47

Source: District census handbook 2011, District Raipur and Durg, state Chhattisgarh

3.9 SALIENT OBSERVATION OF THE SOCIO-ECONOMIC SURVEY

3.9.1 Salient observation of the survey / study area

- **House pattern:** Types of housing varied from thatched to pucca (pakka) houses 60% houses were in pucca (pakka) form 20% in semi pakka and 20% houses were observed in kaccha form.
- **Employment:** Main occupation in the study area was agriculture and Labor Work its allied activities eg. Cattle rearing, dairy farming etc. Other income generation sources of the area,



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small business; private jobs etc. The labours were getting daily wags in the range of 300-350 Rs, depending on type of work they set

- **Agriculture Labour and wage rates:** The wages of agriculture labour are varied from Rs. 100 (2010) to Rs. 235 (2011). The prevailing labour charges of agriculture operations are varied with the operations of cultivations of crops i.e. ploughing, leveling, weeding, transplanting, harvesting and winnowing. The actual wage rates of agriculture labour varied from Rs. 252 to 200 per man day in different operations of the crops. The rates are higher in peak operation periods i.e. ploughing of seeds and harvesting of crops.
- **Fuel:** The primary sources of cooking fuel were LPG, cow dung and coal etc.
- **Major crops of study area, production & yield:** The various crops are grown by the cultivators in Study area. The rice (70.8%) was found to be major crop of the state. The cultivators are also found to be grown tiwra (6.5%), gram (4.6%), paddy (4.9%) and wheat (1.9%). The maize, urd, Niger, soybean, arhar, mustard, kulthi, alsi, groundnut, til, masoor, pea, moong, jwar, urd, kulthi and sunflower are also grown in small proportion by the cultivators in the Study Area.
- **Migration from other states:** During survey it was found that local population were not migrating for employment purpose, they prefer only local employment
- **Language:** Official language Hindi As well As Hindi is spoken and understood by most of the population. Chhattisgarhi is also widely spoken here by the locals.
- **Sanitation:** Toilet facility is one of the most basic facilities required in a house. There was no proper drainage line in the villages, open and kachha drainage which was not working properly seen in most of the villages. Various villages in study area now actively involved in open defecation free (ODF) in the community level under which toilet facilities developed within several villages. The overall position of cleanliness was near to satisfactory
- **Drinking water Facilities:** During the survey it was observed diverse sources of drinking water supply in villages. Major source of drinking water in the study area were hand pumps, tap water and dug wells and canal. During survey people from some villages reported Water Quality are not good and shortage in summer season
- **Education facilities:** Most of the villages had education facilities in the form of aanganwadi and primary schools. Higher education facilities were available in the range of 3-5 km. Colleges and other diploma courses were available at Birgaon City.
- **Transportation facility:** For transportation purpose auto, jeep and private bus services were available in the study area; however villagers reported that transportation facilities were not frequently available. Private vehicles like bicycles & motor cycles were also used by villagers for transportation purpose. Urkura Railway Station – 4.7 km (ESE).
- **Road connectivity:** Most of the roads were pucca and the very few pucca roads were badly in need of repair and maintenance. More than half the households reported that roads they frequently used were semi pucca.
- **Communication facilities:** For communication purpose mainly mobile phones, newspapers & post offices were present in the villages.



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- **Medical facilities:** There were healthcare facilities available in the study area. In some of the villages primary health sub centers were available. Hospitals and other better health centers were available in the range of 5-10 km at town/city place.
- **Electricity:** All villages were availing electricity facility for domestic and agriculture purposes. Solar Street lights were seen in some of the villages.
- **Gram Panchayat facility:** Most of the villages were having gram panchayat building and Community halls and building found well maintained. Some of the villages are having female sarpanch, it indicates that they are in good number and also taking interest in politics. But they are unaware about their rights.
- **Market facility:** Study area was predominantly rural. In villages, small shops were available for daily need things. Weekly market facility was available in some villages. Wholesale market was available Birgaon and Siltara city.
- **Banking facility:** The study area has almost all the schedule commercial banks with ATM facility at urban areas and the district HQ.
- **Recreation facilities:** Television and radio were the main recreation facilities in the study area. Newspaper/magazine facilities were also used by villagers. Internet based Mobile usage has gained the highest popularity. Most of the youth are found to be using the Mobile based applications. At some places video parlors are also seen. Cinema houses are not found in the rural area. It is only found in Raipur City which is also one of the main sources of recreation. Rural areas also frequently organize the sports and cultural events; like Jas Git; Ramyan Katha; Ramlila; Guru Ghasidass Jayanti. The area has enough resources for recreations.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Air Environment

The proposed project will impact on the air quality parameters like PM₁₀, PM_{2.5}, SO₂, NO_x and CO. The raw material handling plant, IF's will emit dust and fumes. Apart from the above, there will be fugitive dust emissions due to transportation, storage and processing of raw materials.

Total 3 stacks were presents which will be attached to the respective equipment through which the emissions are likely come out.

Consideration for modelling

- Total emission from induction furnace will be discharges through two stacks 30m each
- Proposed emission levels will be maintained @ 30 mg/NM³
- Induction furnace capacity 316800 TPA (25MTx4)
- DG sets 3x500 KVA (1 stack)
- 330 working days



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**TABLE 8
RESULTANT CONCENTRATIONS DUE TO PROPOSED PROJECT
WITH DG SETS AND PROCESS UNIT**

Pollutant	Maximum Baseline Concentration in nearest and downwind location ($\mu\text{g}/\text{m}^3$)	Predicted conc. due to project activities ($\mu\text{g}/\text{m}^3$)		Incremental Conc. ($\mu\text{g}/\text{m}^3$)	Resultant Conc. ($\mu\text{g}/\text{m}^3$)	Limits (Industrial/ Residential, Rural) Concentration ($\mu\text{g}/\text{m}^3$)
		DG sets	Process units			
Particulate Matter (PM10)	96.6	0.29	0.42	0.71	97.31	100
Particulate Matter (PM2.5)	35.1	0.11	0.15	0.26	35.36	60
SO ₂	24.7	0.29	--	0.29	24.99	80
NO ₂	33.4	5.0	--	5.0	38.4	80

Proposed Particulate matter emission limit will be considered as 30 mg/NM³. Hence it is inferred that considering incremental concentration levels, the pollution load exerted due to proposed project will be insignificant.

The mitigation measures adopted are:

- Roads are frequently sprinkled with water.
- Raw Materials like will be stored under covered shed.
- Regular maintenance of vehicles and machineries are carried out in order to control emissions.
- Green belt development will be developed done in plant premises outside plant too.
- Green belt will also be developed on the sides of approach road.
- Protective appliances will be provided to all the workers exposed in dusty atmosphere.
- Avoid no overloading and over speeding of the trucks.
- Workers are equipped with all personal protective devices like Gum Boot; hand gloves; Safety helmet; Safety goggles, earplugs at work place.
- Transportation of materials will be limited to day hours only.
- Periodical maintenance of process machinery.

Noise Environment:

During the normal operation of manufacturing process noise will be generated due to Induction Furnaces, ID Fan, Blower/air Fan, Cutting/Shearing Machine and DG Sets, etc. the ambient noise levels are expected to increase significantly with the attributes of the respective equipment, but this noise will be restricted close to the concerned equipment. The preventive measures are given below:

1. Equipment should be standard and equipped with silencer. The equipment should be in good working conditions, properly lubricated and maintained to keep noise within permissible limits.
2. High noise zone should be marked and earplugs shall be provided to the workmen near high noise producing equipment. The workmen should be made aware of noise and vibration impacts on their health and mandatory use earplugs.
3. Proper shifting arrangement shall be made to prevent over exposure to noise and vibration.



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4. Tall trees with heavy foliage shall be planted along the boundary / project site / plantation area, which will act as a natural barrier to propagating noise.
5. Silent DG sets shall be used at construction camp / project site.
6. Speed limits shall be enforced on vehicle.
7. Use of horns / sirens shall be prohibited.
8. Use of loud speakers shall comply with the regulations set forth by CPCB.
9. Regular noise monitoring shall be carried at construction camp / project site to check compliance with prevailing rules.

Water Environment:

In general, the proposed project may have some impact on the water environment. The impact may be on the source of water in the form of depletion water resources of the area.

Total 343 KLD water will be required out of which 326 KLD water will be required for cooling purpose and 17 KLD water will be required for Domestic purpose. The water will be sourced from surface water.

Industrial Water requirement will be fulfilled through surface water from Kharun river. Application form for sanction of allotment of water by Water Resources Department provided in Annexure IV.

The cooling will be done in closed circuit cooling system to achieve better utilization of water. No industrial effluent will be generated.

Domestic effluent about 13.6 KL will be generated which will be treated through 15 KLD Sewage Treatment Plant, treated waste water will be used in green belt irrigation and slag quenching etc.

The various control measures that will be adopted are:

- No pre-treatment of raw water is required. As the water will be used for cooling purpose only.
- No wastewater generation from the process
- Closed circuit cooling system will be implemented.
- Rain water charged to ground water.
- All stock piles will be on pucca flooring to prevent for any ground water contamination.

Vehicular Movement

All the major raw materials and finished products will be transported through trucks by road. All the trucks carrying sponge iron or such dry powdery material will be properly covered to avoid any leakage and fugitive emission.

Biological Environment

There is no ecological sensitive area like national park, sanctuary, biosphere reserve, wetland, forest, etc. within 10 km radial distance from the project site. No rare or endangered flora/fauna were recorded in the study area. Proposed **M/s. MKPIPL** will be green-field project, no tree cutting involved in the project. There will not be any increase in pollution load to the greater extent since it is clean technology. Moreover, incremental emission of air pollutants is not likely to induce any significant



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changes in the ecology as the ambient air quality standards will remain within the limits. Thus, the impact on local ecology in surrounding area would be minimum.

The total plant area is 5.08 Ha out of which **M/s. MKPIPL** will be planted of different local and fast growing species within 2.03 ha (40% of total plant area). It is proposed to plant about 3045 Nos. (@1500 Sapling/Ha.) with the proposed implementation of the project. It will enable us to develop green belt all around the area, along with 6 meter road for material transportation. The road side plantation will also be done.

Socio-economic Impacts:

The land use converted in to industrial purpose, thus there will be no issue of involvement of any agriculture land or settlement on the contrary there will be positive impact on the socio economic environment of the area. Increase in direct/indirect job opportunity shall take place. Services in the locality shall be used and accordingly growth in economic structure of the area will take place.

5.0 ANALYSIS OF ALTERNATIVES (SITE AND TECHNOLOGY)

5.1 SITE SELECTION

Suitable site for a project is as important as selecting a technology and suppliers. Factors which are taken into consideration for selection of site are proximity to raw materials or market and availability of resources like manpower, water, infrastructure and ease of transportation. However a new dimension has also raised concerns in selection of site and environment.

The project site located village Sarora, Tahsil & District Raipur. The site is already selected and all the facilities related to production are easily available for proposed plant.

Selection of Technology

- Induction Furnace based Steel Melting Shop with Continuous Casting Machine (CCM).

The above technologies are most proven technology in secondary metallurgical activities.

The management has decided to adopt the best operating practices to suit world class requirements. As the products are going to be external audits to fulfill QA/QC requirements. The products will be manufactured based on green chemistry concept so that there are minimum emissions and zero wastewater generation during manufacturing process.

6.0 ENVIRONMENTAL MONITORING PROGRAM

An Environmental Management Cell (EMC) will be established for the proposed project under the control of Executive Director followed by General Manager. The EMC will be headed by an Environmental Manager having adequate qualification and experience in the field of environmental management. Environmental monitoring of ambient air quality, surface and ground water quality, ambient noise levels, etc. will be carried out through MoEF&CC accredited agencies regularly and reports will be submitted to CECB/MoEF&CC. A provision of Rs. 6.00 lakhs will be made available towards recurring cost for environmental monitoring programme.

7.0 ADDITIONAL STUDIES

7.1 Public Consultation

The Draft EIA-EMP report for proposed installation of Induction Furnaces with CCM to produce 363000 TPA MS Ingot/Billets and/or 350000 TPA Rolled Steel product through Hot Charging Rolling Mill at Village: Sarora, Block: Dharsiwa, Tehsil and District: Raipur, Chhattisgarh State is prepared as



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per the TOR issued by SEAC, Chhattisgarh and the draft report is submitted for public consultation process as per the provisions of EIA Notification 2006 and amendments thereof.

After completing the public consultation process, the points raised and commitment of project proponent during the public hearing will be incorporated in the final EIA/EMP report for final submission to Environmental Clearance.

7.2 Risk Assessment & Disaster Management Plan

The assessment of risk in the proposed project has been estimated for fire, explosion and toxicity and corresponding mitigation measures are suggested in the EIA/EMP report.

A detailed Disaster Management Plan for facing disasters due to natural effects and human reasons is prepared and incorporated in the draft EIA/EMP report for ensuring safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of Disaster Management Plan, it will be widely circulated and personnel training through rehearsals. Site facilities, procedures, duties and responsibilities, communications, etc. are considered in details in the Disaster Management Plan.

8.0 PROJECT BENEFITS

The proposed implementation of induction furnace becomes a project of national interest as the proposed technology to produce MS Billet through Induction Furnace with CCM and/or Rolled Steel product through Hot Charging Rolling Mill is well establish and clean technology. The technology does not involve any fossil fuel consumption.

All these technology required to be promoted for securing a better energy efficiency and safer environment.

• CORPORATE ENVIRONMENT RESPONSIBILITY (CER)

An O.M. was issued by MoEF&CC dated 30th Sept 2020 in supersession of the previous O.M. dated 1st May 2018 and it states that EAC/SEAC will prescribe specific condition(s) in physical terms during recommendation of proposal for grant of EC based on the commitments made by PP to address the concerns raised during the Public consultation and it will be included under EMP cost. TOR which required considering as per O.M. dated 01/05/2018 issued by MoEF&CC, New Delhi proposals regarding Corporate Environment Responsibility (C.E.R.).

The total project cost is Rs. 9200.00 Lakh. 2.0% of the total cost becomes Rs. 184.00 Lakh approx. Company has proposed Rs 184 Lakh as CER fund in addition to EMP cost.

9.0 ENVIRONMENTAL COST BENEFIT ANALYSIS

On overall assessment of the project with technical and financial aspects, it is concluded that the proposed induction furnace with CCM to produce finished ingots products and/or Rolled Steel product through Hot Charging Rolling Mill is technically highly feasible and financially profitable.

The project is of utmost importance as it is going to reduce the GHG emission & promote sustainable development with a saving in energy consumption. In addition, the project being located away from the urban areas will avoid pollution-addition to the densely populated areas; at the same time promote the growth of the area, through CER and CSR activities.

Apart from the tangible benefits, there are other intangible benefits of the project. The project helps to increase the economic growth of the state/nation.

It can be concluded that the project is more beneficial economically and viable with environment sustainability by adopting proper environmental protection measures.



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10.0 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan comprising following set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels.

- Overall conservation of environment.
- Minimization of natural resources and water.
- Ensure effective operation of all control measures.
- Monitoring of cumulative and longtime impacts.
- Ensure effective operation of all control measures.
- Control of waste generation and pollution.
- Rain water harvesting will be proposed to collect 100% of the rain water in the project area to conserve the ground water.

Judicious use of the environmental management plan addressing the components of environment, which will be likely affected by the different operations in the project, will be implemented. Total cost estimated is 9200 Lakhs Rs., out of which Rs. 6000.00 Lakhs is estimated for plant and machinery and capital cost Rs. 150.00 Lakhs has been estimated for pollution control equipment and recurring cost Rs. 13.0 Lakhs for implementation of EMP.

11.0 CONCLUSION

The proposed project of **M/s. MKPIPL** will be beneficial for the overall development of the nearby villages. Some environmental aspects like dust emission, noise, wastewater, traffic density, etc. will continue to be controlled within permissible norms to avoid impacts on the surrounding environment. Necessary pollution control equipment like bag house, water sprinklers, enclosures, etc. form integral part of the plant infrastructure. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of green belt and plantation in nearby village and along transport road, adoption of rainwater harvesting/recharging in the plant and in nearby villages will be carried out. The proposed CSR activities to be initiated by the company will be helpful to improve the social, economic and infrastructure availability status of the nearby villages.

Thus, It will be beneficial to the society and will help to reduce the demand-supply gap of steel to some extent and will contribute to the economic development of the region in particular and country in general.

12.0 DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed project of M/s MKPIPL are carried out by M/s Anacon Laboratories Pvt. Ltd., Nagpur (M/s ALPL). Anacon established in 1993 as an analytical testing laboratory and now a leading Environmental Consultancy firm backed by testing lab for environment and food in Central India region. M/s ALPL is a group of experienced former Scientists from the Government Institutions and excellent young scientist of brilliant career with subject expertise. It is recognized by Ministry of Environment & Forests, New Delhi for carrying out environmental Studies & accredited by Quality Council of India (QCI) for conducting Environmental studies having Accreditation Certificate No.: NABET/EIA/1922/RA 0150 dtd. 03 Feb 2020 Valid till September 30, 2022.