



## **EXECUTIVE SUMMARY**

## INTRODUCTION

M/s. Hindustan Coils Limited (hereafter referred as HCL) is in operation of its unit with existing environment clearance from SEIAA CG (1335/SEIAACG/SIA/CG/NCP/448 dated 04.02.2017) and Consent under Water Act and Air Act from CECB (1924 and 1926/TS/CECB/2018 dated 24.05.2018) for its 56745 TPA rerolled product manufacturing through Induction Furnaces. Now, in order to achieve better energy efficiency in the melting furnaces and rolling mill the management has decided to increase the production capacity by increasing melting crucible power input capacity from existing capacity 5 MT to 10 MT per heat. Thus, HCI will be able to achieve the products will be produced.

As per Environmental Impact Assessment Notification dated 14<sup>th</sup> 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 expansion project.

The online application for prior Environmental Clearance (Form-1) was submitted to SEIAA/SEAC, Chhattisgarh on Dated 25/06/2018 for proposed expansion project. The proposal was considered by the State Expert Appraisal Committee (SEAC) during its meeting held on 29<sup>th</sup> August 2018. The SEAC has suggested standard Terms of References (ToR) (Vide Letter no. 378/SEACCG/RO&IND/Raipur/728 dtd. 21.12.2018) for preparation of the EIA-EMP Report.

Environmental baseline studies were carried out during in Post-Monsoon Season 2018. This EIA report is prepared based on the ToR conditions recommended by SEAC, Chhattisgarh and project related technical details provided by M/s. Hindustan Coils Limited. ToR compliance with cross referencing provided in the beginning of the chapter scheme.

## **IDENTIFICATION OF PROJECT**

The existing and proposed plant details of M/s. HCL are given below:

Products	Existing		Proposed capacity addition	Ultimate Capacit Expansior	ty after า
Troublis	Facility	Capacit y (TPA)	Capacity (TPA)	Facility	Capacit y (TPA)
M.S. Billet	5 MT (Twin Crucible based) X 4 No. Induction Furnaces	60000	98400	*10 MT X 4 Nos. Induction Furnaces	158400
Rerolled Steel Products	Rerolling Mill with online hot charging of semi- finished steel (189 TPD)	56745	93735	Rerolling Mill with online hot charging of semi-finished steel (456 TPD)	150480

## LOCATION OF THE PROJECT

Plant is located at Phase – 1, Siltara Industrial Growth Centre, Tehsil and District Raipur of Chhattisgarh. The nearest city is Raipur which is around 13.34 km in south east direction. Nearest





airport is also Raipur which is around 20.00 km at SSE direction. The nearest roadway is National Highway - 200 which are 2.26 km in West direction whereas Ring Road 3 is about NH-200 are 3.62 km in SSW direction. The study area of 10 km radial distance from the project site is shown in **Figure 1**.

## EIA/EMP REPORT

In line with the approved ToR obtained from SEAC, Chhattisgarh, baseline environmental monitoring was carried outduring Post monsoon season (15<sup>th</sup> October 2018 to 15<sup>th</sup> January 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 study area from the project site.(**figure 1**) 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 alongwith 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)





# TABLE 1DETAILS OF ENVIRONMENTAL SETTINGS

Sr. No.	Particulars	Details
1.	Project Location	Phase – 1, Siltara Industrial Growth Centre, Tehsil and District Raipur (CG)
2.	Co ordinate	Latitude : 21 <sup>0</sup> 21,,36.32"N ;
		Longitude: 81 <sup>0</sup> 41'11.19"E
3.	Toposheet No.	F44P11 (Old No. 64 G/11)
4		Maan annual minfall in 4050.0 mm
4.	Climatic Conditions	Mean annual fainfail is 1252.8 mm
		remperature : 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.)
5.		IMD Raipur – 16.71 km in SSW
6.	Land Form, land Use and Ownership	Existing Industrial Land.
7.	Site topography	Proiect site located at 295 m (MSL) : Flat Terrain
8.	Nearest roadway	State Highway No. 2 – 2.26 km (W)
	· · · · · · · · · · · · · · · · · · ·	Ring Road $3 - 3.62$ km (SSW)
9.	Nearest Railway Station	Mandhar Railway Station – 3.10 (SE)
10.	Nearest Air Port	Swami Vivekanand International Airport – 20.0 km (NNW)
11.	Nearest Port	NA
12.	Nearest lake	NA
13.	Nearest State/National	Madhya Pradesh – 101.73 km (W)
	Boundaries	Maharashtra – 106.3 km (WSW)
		Odisha – 100.1 km (ESE)
14.	Nearest major city with	Nearest city – Raipur – 13.34 km (SSW)
	2,00,000 population	
15.	Distance for sea coast	NA
16.	Hills/valleys	NA
17.	Nearest Reserved/	None
	Protected forests	
18.	Nearest water bodies	Kharun river – 7.62 km (W)
19.	Seismic zone	The proposed expansion project site falls in zone-II as per
		IS 1893 (Part-I): 2002. Hence, seismically, it is a stable
		zone.





#### **PROJECT DESCRIPTION**

#### PROCESS DESCRIPTION

## Manufacturing process of Steel Melting Shop with CCM along with Hot Charging Rolling Mill

- The manufacturing process identified for the proposed expansion unit is one which is well established and proven and 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 (10 MT capacity each) with higher power input capacity will be setup with completely automatic charging facility as well as power sharing panel also. Electronic software will be 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 then 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 herts in charge 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 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.

#### > Continuous Casting Machine (CCM):

- The ladle containing hot metal liquid steel will be placed on the CCM platform and continuous casting of hot billet will be carried out in the same for which one 2 strand CCM with 6 meter x 11 meter radius will be setup, the casting will be done through a highly automated controlled cooling software governed mechanism by which the casted billet will be so cooled that the temperature of billets do not fall below 1050°C. The case formation in the CCM mold starts with drop in surface temperature below 1520°C, the liquid metal inside the case contains enough energy for maintaining the overall temperature of billet for hot online rolling.
- In the CCM section hot billet shearing machines will be installed with each casting strand, so as to facilitate the cutting of billets to proper length for feeding in to the rolling mill.

## > Hot Charging Rerolling Mill:

Raw Material i.e. Billet coming from CCM in red hot condition is cut either by Gas Cutting or automatic hot billet Shearing Machine. In the proposed plant automatic hot billet shear machines are going to be installed with each strand. The gas cutting facility will be maintained as a backup to the hot billet shearing machine.





After the Billet is cut into required length, then pushed out to rolling stands for re-rolling. Steel Pieces are rolled through all stands in order to get required shape of finished goods i.e. rerolled product.

## LAND REQUIREMENT

No additional land required to be acquired. Existing Lease hold land of about 2.24 Hectare (5.53 Acres) is enough. Land is located at Plot 19-20, Phase I within Siltara Industrial Growth Centre; no change in land use is involved. The land details are provided as follows:

## TABLE 2LAND UTILIZATION PATTERN

Sr. No.	Particulars	Area (In Hectare)	Percentage (%)
1.	Constructed Area	1.22	54.46
2.	Open Area	0.572	25.54
3.	Green belt	0.448	20.00
	Total Area	2.24	100.00

#### **RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT**

The raw material will be transported through truck. It is estimated that approx. 57 trucks/day required for transportation of raw materials and finished products of the plant

#### Solid and Hazardous waste generation

Total Solid wastes generation through process is estimated to be about 32181 MT/Yr which includes Mill scale, Defective Billet, Miss Roll and End Cutting, Slag and Refractory Waste are 3168 MT/Year, 3168 MT/Year, 3010 MT/Year and 22675 MT/Year and 160 MT/Year respectively. Waste oil/used oil will be 4 KL/Yr which are classified as hazardous waste.

#### WATER REQUIREMENT & SOURCE

The total makeup water requirement for the project will be about 128 m<sup>3</sup>/day. (08 KL for domestic purpose).Industrial Water requirement will be fulfilled through CG IspatBhumi Limited"s Industrial Water Supply Network & Domestic Water requirement will be fulfilled through existing borewell.

#### POWER REQUIREMENT & SUPPLY

Power requirement will be around 19.28 MW which will be drawn from CSPDCL. An emergency backup DG set of 500 KVA is also proposed.

#### MANPOWER REQUIREMENT

The existing manpower is 85 whereas additional manpower requirement for proposed expansion project of M/s. Hindustan Coils Ltd. will be 100manpower during operation phase. Thus, the total manpower will be 185 people after proposed expansion activities. Preference will be given to local people, depending upon their qualification and skill. Marginal employment will also generate during construction phase.

#### FIRE FIGHTING FACILITIES

In order to combat any occurrence of fire in plant premises, fire protection facilities are 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.





#### **PROJECT COST**

The project cost for expansion of the project is estimated as Rs. 3101 Lakhs.

## **EXISTING ENVIRONMENTAL SCENARIO**

#### **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 (15<sup>th</sup> October 2018 to 15<sup>th</sup> January 2019).

## **METEOROLOGY & AMBIENT AIR QUALITY**

#### Summary of the Meteorological Data Generated At Site (15<sup>th</sup> Oct. 2018 to 15<sup>th</sup> Jan. 2019)

Predominant Wind Direction	Post monsoon season
First Predominant Wind Direction	ENE (20.17 %)
Second Predominant Wind Direction	NE (19.49 %)
Calm conditions (%)	0.83
Avg. Wind Speed (m/s)	3.54
Temperature ( <sup>0</sup> C)	11-35

The status of ambient air quality within the study area was monitored for post-monsoon season for at 8 locations covering project site, Akoli, Gorhi, Sankra, Dhaneli, Nimora, Siltara, Mandhar 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 (PM<sub>10</sub>), Fine Particulates (PM<sub>2.5</sub>), Sulphur Dioxide (SO<sub>2</sub>,), Oxides of Nitrogen (NO<sub>x</sub>) and carbon monoxide (CO), Ammonia, Ozone, Benzene and BAP were monitored. The details of Ambient Air Quality Monitoring Results are summarized and given in **Table 3**.

Sr.	Location		<b>PM</b> <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
No.	Location		µg/m³	µg/m³	µg/m³	µg/m³	mg/m <sup>3</sup>	µg/m³	µg/m³
		Min	60.1	20.3	12.2	19.9	0.345	14.6	9.1
1	Project Site	Max	78.2	29.9	20.2	26.7	0.374	18.7	11.9
		Avg	68.6	25.0	16.7	23.1	0.359	17.0	10.4
		98 <sup>th</sup>	77.7	29.5	20.0	26.2	0.374	18.7	11.8
	Min	61.3	19.4	10.1	12.5	0.215	14.1	8.2	
2	Akoli	Max	88.9	29.4	17.7	21.6	0.253	17.9	11.7
2.		Avg	73.9	23.5	14.2	16.3	0.234	16.1	9.7
		98 <sup>th</sup>	88.2	29.0	17.7	21.4	0.253	17.9	11.7
		Min	53.6	18.4	8.4	10.1	0.225	13.3	8.1
3	Gorhi	Max	79.1	29.3	16.8	17.9	0.269	18.9	106
0.	Com	Avg	64.9	24.4	11.9	13.1	0.248	15.8	13.4
		98 <sup>th</sup>	79.0	29.2	16.7	17.7	0.268	18.6	62.4
		Min	52.6	16.1	11.1	17.1	0.335	12.1	8.0
4	Sankra	Max	80.2	27.9	17.2	24.9	0.369	16.3	11.7
7.	Vannia	Avg	63.2	20.6	14.1	20.4	0.353	14.1	9.3
		98 <sup>th</sup>	79.3	27.9	17.1	24.7	0.369	16.1	11.7
5.	Dhaneli	Min	63.7	20.2	10.2	12.3	0.365	15.2	6.5

 TABLE 3

 SUMMARY OF AMBIENT AIR QUALITY MONITORING RESULTS





Sr.	Location		<b>PM</b> <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
No.	Location		µg/m³	µg/m³	µg/m³	µg/m³	mg/m <sup>3</sup>	µg/m³	µg/m³
		Max	88.3	30.3	17.9	22.6	0.386	19.3	11.7
		Avg	73.7	24.6	13.7	15.6	0.376	16.9	8.2
		98 <sup>th</sup>	87.7	30.0	17.7	22.1	0.386	19.3	11.0
		Min	50.9	17.2	9.3	10.4	0.209	11.2	8.2
6	Nimora	Max	75.4	26.9	18.8	17.7	0.269	16.8	11.6
0.	Minora	Avg	62.1	21.3	12.8	13.6	0.231	14.2	9.6
		98 <sup>th</sup>	52.3	22.5	18.6	17.6	0.265	16.7	11.5
		Min	90.1	32.3	11.3	19.0	0.451	12.1	10.2
7	Siltara	Max	122.3	44.9	20.8	32.2	0.495	20.5	17.9
<i>'</i> .	Sillara	Avg	102.9	38.1	15.4	26.0	0.471	16.3	13.3
		98 <sup>th</sup>	121.4	44.7	20.5	31.8	0.494	20.2	17.7
		Min	65.6	19.1	10.2	10.0	0.210	14.2	8.1
8	Mandhar	Max	88.4	30.3	19.8	19.9	0.235	18.3	11.8
0.	Wallolla	Avg	75.2	23.3	13.5	13.5	0.222	16.4	10.1
		98 <sup>th</sup>	88.2	30.0	19.1	19.7	0.234	18.2	11.8
CPCB Standards			100	60	80	80	2	100	400
			(24hr)	(24hr)	(24hr)	(24hr)	(8hr)	(8hr)	(24hr)

From the above results, it is observed that the ambient air quality at all the monitoring locations except  $PM_{10}$  value at Siltara (Max. 122.3  $\mu$ g/m<sup>3</sup>) was within the permissible limits specified by CPCB.

## 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.** 

Sr.	Manitaring Lagotiona	Equivaler	nt Noise Level
No.	Monitoring Locations	Leq <sub>Day</sub>	Leq <sub>Night</sub>
Reside	ential Area		
1.	Akoli	51.9	41.6
2.	Dhaneli	51.6	42.7
3.	Giraud	48.3	38.1
CPCB	Standards dB(A)	55.0	45.0
Comm	ercial Area		
4.	Sankra	54.1	43.8
5.	Mandhar	54.1	42.6
CPCB	Standards dB(A)	65.0	55.0
Silenc	eZone	i i	
6.	Tanda	47.2	36.1
CPCB	Standards dB(A)	50.0	40.0
Indust	rial Area		
7.	Project Site	71.3	58.2
8.	Siltara	62.8	56.3
CPCB	Standards dB(A)	75.0	70.0

 TABLE 4

 SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS

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





## SURFACE AND GROUND WATER RESOURCES & QUALITY

#### 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.

## 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 Yrs. 2007 to 2018). The project is located in "Semi critical "zone as per CGWA classification.

#### 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 Pedi plain 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.

#### Water Quality

Groundwater and surface water quality was assessed by identifying 8 groundwater (Borewell/ handpump) locations in different villages and 5 surface water samples.

#### A. Groundwater Quality

The analysis results indicate that the pH ranged between 7.42 - 8.31. The TDS was ranging from 461.83-1146 mg/l. Total hardness was found to be in the range of 260-732.33 mg/l. The fluoride concentration was found in the range of 0.21-0.62 mg/l. The nitrate and sulphate were found in the range of 19.86-35.67 mg/l and 24.7-52.03 mg/l respectively. Heavy metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Mn, Zn and Hg) were found to be bellow detection limit and within specified standards.

Sr. No.	Locations	WQI	Quality	Remark
1	Project Site	55.61	Good	
2	Sondra	86.79	Good	
3	Mandhar	67.72	Good	Water quality assessed based upon physico-
4	Charoda	72.98	Good	chemical parameters and most samples are
5	Giraud	121.64	Poor	physico-chemically good except Giraud and
6	Achholi	59.15	Good	Siltara
7	Mundrethi	83.13	Good	
8	Siltara	136.25	Poor	





## B. Surface Water Quality

The analysis results indicate that the pH ranged between 7.54-7.81 which are 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 342-540 mg/l which is within the permissible limit of 2000 mg/l.The total hardness recorded was in the range of 153.92-305.76 mg/l as CaCO<sub>3</sub> 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 22.61-129.56 mg/l and 19.28-37.43 mg/l respectively.

Heavy metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Fe, Mn, Zn and Hg) were found to be very low and within specified standards.

## 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 except project site and Giraud.

#### 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 28 May 2016 satellite image with reference to Google Earth data. These were later verified by using SOI toposheet, Google Earth imagery and Ground trothing 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**.

SI. No.	Level-I	Level-II	Area Sq. Km	Percentage
		Settlement	58.87	18.75
	Puilt up lond	Industrial Settlement	22.1	7.04
1	Built-up latiu	Road Infrastructure	7.63	2.43
		Railway	1.53	0.49
		Brick Kline	1.87	0.60
2	Barren Land	Barren Land	0.98	0.31
3	Agricultural Land	Agriculture land	180.71	57.55
4	Scrubs/Wastelands	Open Scrub	29.21	9.30
5		River	4.92	1.57
	Water bodies	Water bodies	2.31	0.74
		Drainage	1.98	0.63
6	others	Mining/Stone Quarry	1.89	0.60
	Total		314	100

#### TABLE 5

#### 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 1.4-1.66 g/cc which indicates favorable physical condition for plant growth. The water holding capacity is between 18.0-35.05 %. Infiltration rate, in the soil is in the range of 15.17-25.8 mm/hr. The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from 205.05-260.02 mg/Kg and 53.28-125.08 mg/Kg respectively. Chloride is in the range of 66.11-264.08 mg/Kg. Organic matter and nitrogen were found in the range of 2.08-3.41 % and 152.29-173.34 kg/ha.

## **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 110 floral species were observed in the study area. The details about the floral composition are as follows.

- a. Trees: Total 62 species were found in the study area
- b. Shrubs (small trees): Total 23 species were enumerated from the study area.
- c. Herbs: In the study area 13 species were observed.
- d. Bamboo & Grasses:07 species were enlisted from the study area
- e. Climbers and Twiners: Total 04 species of climbers/ twiners were recorded in the study area.
- f. **Parasite :** Each 1 species enlisted in the area

## Fauna in the Study area:

Among mammals; *Canisaureus* (Jackal), Common Langur, *Herpestesedwardsi* (Common Mongoose), *Vulpesbengalensis*(Indian fox), are protected in schedule –II. Whereas, *Lepusnigricollis*(Black-naped hare), *Funambuluspinnati*(Palm squirrel) protected in Schedule IV and Rats protected in Schedule V.

Among the Herpetofauna, Indian Cobra (*Najanaja*), and Common Rat Snake (*Ptyas mucosa*) were provided protection as per Schedule-II of Wild life protection act, (1972) and Common Indian Krait (*Bungaruscaerulus*), Indian Toad (*Bufoparietalis*) were provided as per Schedule – IV of Wildlife protection act 1972 and as amended.

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

## 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 education facilities infrastructure and evaluation 2011 are presented in **Table 7 & 8** respectively.

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

No. of villages	35
No of Towns	02
Total households	40548
Total nonulation	100171



Proposed Expansion of Induction Furnace and Rerolled Steel Products from 56745 TPA to 150480 TPA at Plot No. 19 - 20 Phase – 1, Siltara Industrial Growth Centre, Tehsil and District Raipur (CG) **M/s. Hindustan Coils Limited** 



Male Population	98918
Female population	91253
SC Population	27081
ST Population	7714
Total literates	124677
Total Illiterates	65494
Total workers	69114
Total main workers	58886
Total marginal workers	10228
Total non-workers	121057

Source: Primary census abstract 2011, district Raipur, Chhattisgarh

TABLE 7

## DETAILS REGARDING EDUCATION FACILITIES WITHIN 10 KM RADIUS STUDY AREA

Gov. Primary school	Private primary school	Gov. Middle School	Private Middle School	Gov. Secondary School	Gov. Senior Secondary School	Private Senior Secondary School	Gov. Arts, Science Degree College	Pvt. Arts, Sci.& Comm. College

Source: District census handbook 2011, District Raipur, State Chhattisgarh

TABLE 8
INFRASTRUCTURE FACILITIES IN THE STUDY AREA

	In percentage (%)									
Yr.	Educ ation	Drinking water	Road	Power	Recrea tion	Transport ation	Medical	Commu nication	Bank	Drainage
20 11	100	100	100	100	94	94	37	91	77	49

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

#### SALIENT OBSERVATION OF THE SOCIO-ECONOMIC SURVEY

- Some of the villages have good facilities like R.O water plant, Sewing machine center, etc. in surrounding villages from project site. These all happen only because of CSR initiatives taken by various private limited. These need to be continuing over the years only then villages people standard of living can be raised, but now more important is to find the needful area in which CSR activities intervention brings change.
- 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 Labour Work its allied activities eg. Cattle rearing, dairy farming etc. Other income generation sources of the area, 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. 135 (2011). The prevailing labour charges of agriculture operations are varied with the operations of cultivations of crops i.e. ploughing, leveling, weeding, transplanting, havesting, havesting, havesting, have sting, hav





and winnowing. The actual wage rates of agriculture labour varied from Rs. 152 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 (2.6%), kodo-kutki (2.3%) and wheat (1.9%). The maize, urd, niger, soybean, arhar, mustard, kulthi, alsi, groundnut, til, masoor, pea, moong, jwar, urd, kulthi and safflower 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 is Hindi. 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 defication 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. Mandhar Railway Station – 3.10 km (SE)
- 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
- Medical facilities: There were healthcare facilities available in the study area. In some of the villages primary health sub centres were available. Hospitals and other better health centres 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 Panchyat 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.
- 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.

#### 4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### Air Environment

The proposed expansion will have impact on the air quality parameters like  $PM_{10}$ ,  $PM_{2.5}$ ,  $SO_2$ ,  $NO_X$  and CO. The raw material handling plant, IF's, steel melting shops will emit dust and fumes. Apart from the above, there will be fugitive dust emissions due to transportation, storage and processing of raw materials.

Although, the quantity of production will be increased but ground level concentrations will not be increased as the process of sponge and pig iron melting in induction furnace does not cause any SOX emission, even the NOx formation is negligible it only emits some particulate matter with carbon loss gases exiting from top of induction furnace crucible. The existing emission limit of Particulate matter of 50 mg/NM<sup>3</sup> will be reduced to 30 mg/NM<sup>3</sup>. By use of better quality raw material carbon loss based flue gas generation will also get reduced. Hence it is inferred that considering cumulative concentration levels based on Air (ISCST3) Modeling Studies, the pollution load exerted due to proposed expansion project will be insignificant.

The mitigation measures adopted are:

- The primary & secondary emissions from the Induction furnaces, and continuous casting machine area will be extracted and treated in a fume extraction system.
- Adequate capacity dust extraction measures with swivel hood, ID fan shall be provided at different loading, unloading and transfer points in the raw material handling section.
- Fumes will be evacuated directly from induction furnaces through hoods with swiveling mechanism and ducting.
- The duct carrying fumes from Induction furnaces will join in a mixing chamber from where the gases will be led to the bag house by means of ID fan.
- To control Air Pollution company had already installed Bag Filter with 30 meter chimney which will be upgraded by improvement in number of bags and ID/FD fan capacity to cater the future requirement i.e. to restrict emissions within the 30 mg/Nm<sup>3</sup> in place of prescribed limit of 50 mg/Nm<sup>3</sup>
- Adequate dust suppression system in the form of water sprinklers shall be provided at raw material yard, temporary solid waste dump site and along the vehicular roads.
- There will be dedicated roads for vehicles carrying raw materials and products.
- Adequate greenbelt (20%) is being already provided within plant premises. Whereas, Further, additional plantation will also be developed outside the plant at Atal Nagar (formally known as Naya Raipur)





• Stacks are being already provided with porthole and working platform so that stack monitoring can be done as per norms of statutory authority.

#### Noise Environment:

During the normal operation of manufacturing process noise will be generated due to Induction Furnaces, Rolling mill, ID Fan, Blower/air Fan, Cutting/Shearing Machine and DG Set, 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:

- Equipment will be standard and equipped with silencer. The equipment will be in good working conditions, properly lubricated and maintained to keep noise within permissible limits.
- High noise zone will be marked and earplugs will be provided to the workmen near high noise producing equipment. The workmen will be made aware of noise and vibration impacts on their health and mandatory use earplugs.
- Proper shifting arrangement will be made to prevent over exposure to noise and vibration.
- Tall trees with heavy foliage shall be planted along the boundary of camp / project site / plantation area, which will act as a natural barrier to propagating noise.
- Silent DG sets shall be used at construction camp / project site.
- Speed limits shall be enforced on vehicle.
- Use of horns / sirens will be prohibited.
- Use of loud speakers will be complying with the regulations set forth by CPCB.
- Regular noise monitoring will be carried at construction camp / project site to check compliance with prevailing rules.

#### Water Environment:

The proposed expansion project may have some impact on the water environment. The impact may be on the source of water in the form of depletion of water resources of the area and in the form of deterioration of quality of natural water resources due to discharge of plant effluent.

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.
- No groundwater required for Industrial Cooling. Water will be provided through CSIDC pipeline network.
- Water requirement for domestic purposes only fulfilled through ground water.
- Waste water generated through sanitary/toilet activities. This will be treated in STP and treated water will be used for plantation purposes and dust suppression.
- 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.





## **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 expansion of M/s. Hindustan Coils Ltd. will be within the existing plant premises, no tree cutting involved in the project. There will not be any significant increase in pollution load due to proposed expansion project. Thus, the impact on local ecology in surrounding area would be minimum.

Further, the total plant area is 2.24 Ha out of which M/s. HCL already planted 680 trees of different local and fast growing species within 0.448 ha (20% of total plant area). Plant species observed within plant premises are *Kadamb*, *Conocarpus*, *Badam*, *Gulmohar*, *Neem*, *Cassia*, *Peltaphorum*, etc. M/s. HCL will also carried out additional compensatory plantation within 0.5824 Ha (i.e. 26%) of land at Atal Nagar.

#### Socio-economic Impacts:

The land use is not going to be significantly change as the proposed expansion will be carried out within existing plant premises, 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 ENVIRONMENTAL MONITORING PROGRAM

An Environmental Management Cell (EMC) will be established for the proposed expansion 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.

#### 6.0 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.

## 7.0 PROJECT BENEFITS

#### Proposed Social Welfare Arrangement

The proposed project would provide development of area and consequent indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the central region. M/s. HCL will carry community welfare activities in the following areas:

- Community development
   Education
- Health& medical care
   Drainage and sanitation
   Roads





The company will comply with its obligation for CSR as per Company's Act too.

As per O.M. dated 01/05/2018 issued by MoEF&CC, New Delhi proposals regarding Corporate Environment Responsibility (C.E.R.). The proposed expansion cost of the project is Rs. 3101 Lakhs. Thus, as per CER 1% i.e. 31.01 lakhs will be spent for the improvement of Environment.

## 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.

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. The capital cost required to implement the EMP for proposed expansion is estimated to be Rs40 Lakhs. The annual recurring expenses will be Rs.15 Lakhs has been allocated for implementation of the Environmental Management Plan for proposed expansion project.

#### 9.0 CONCLUSION

The proposed expansion of M/s. Hindustan Coils Ltd. 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 better than the 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 can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed expansion project will not add significant pollution level than existing being it is hot charging process, 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.

#### 10.0 DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed project of M/s HCL 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 as per QCI-NABET SA – 241<sup>th</sup> AC Meeting, dtd. Jan 4, 2019.