EXECUTIVE SUMMARY

1.0   INTRODUCTION

Environmental Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision making tool, which guides the decision makers in taking appropriate decisions for proposed projects. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing.

1.1   Environmental Clearance

As per the Environmental Impact Assessment (EIA); Notification S.O. 1533, 14-09-2006 issued by MoEFCC, Government of India, the MS Ingots/MS Billets Manufacturing Unit expansion project is categorized as Category – B project, which mandates obtaining prior Environmental Clearance from State Environment Impact Assessment Authority, Maharashtra.

1.2   Terms of Reference

M/s. Mundra Steel & Alloys Ltd. (MSAL) submitted the application for Environmental Clearance as per the new notification along with prescribed Form 1, proposed Terms of Reference for EIA study and pre-Feasibility report. The Expert Appraisal Committee considered the project in 154th Meeting on 29th August 2018 and issue the Terms of Reference and prescribed Terms of References is incorporated in the EIA report.

1.3   Brief Description of Project

The proposed project is an expansion project of MS Ingots/ MS billets production (63.33 TPD to 563.33 TPD) at at plot no E-15, MIDC Jejuri, Taluka – Purandar, District – Pune, Maharashtra.. Total land is available with MSAL is 13826.0 sq.m. No additional land is required for the proposed expansion. The project location map is given in **Figure 1**, and 10 km study area map is given in **Figure 2**.

Product Details

Existing Furnace (will be removed)	
Induction furnace	7 MT x 9 Heats = 63.0 TPD
Proposed Furnace (New Installation)	
Induction furnace	2 x 20 MT x 14 Heats = 560 TPD

Project Proponents

Mundra Steel & Alloys Limited was incorporated on 13th April 1993. It is classified as Non-Govt. company and is registered at Registrar of Companies, Pune. Mundra Steel And Alloys Limited's

Corporate Identification Number is (CIN) U27310MH1993PTC071577 and its registration number is 71577. Its registered address is E - 15, M.I.D.C JEJURI JEJURI MH 412302 IN.

It is involved in Casting of metals [This group includes casting finished or semi-finished products producing a variety of goods, all characteristic of other activity classes.
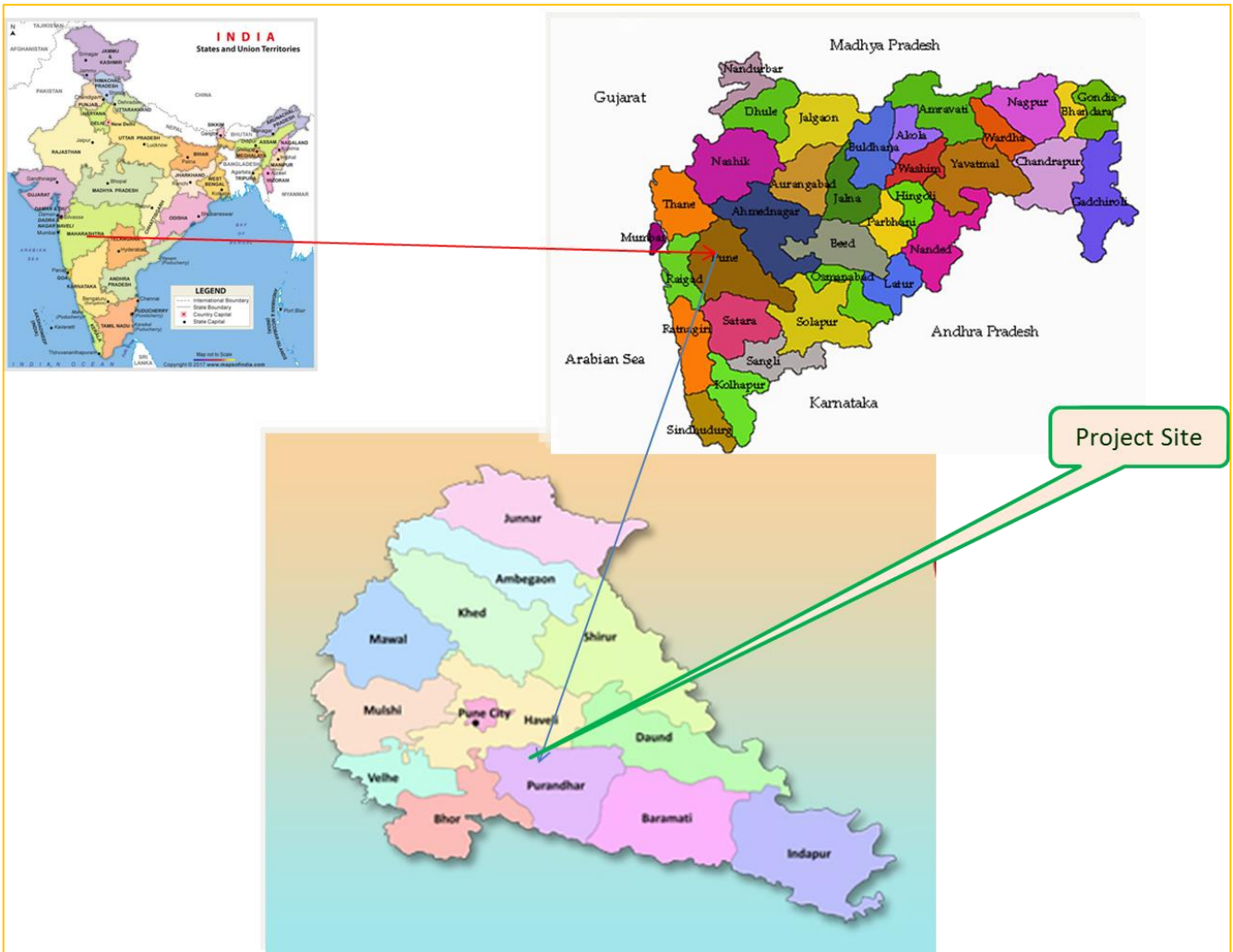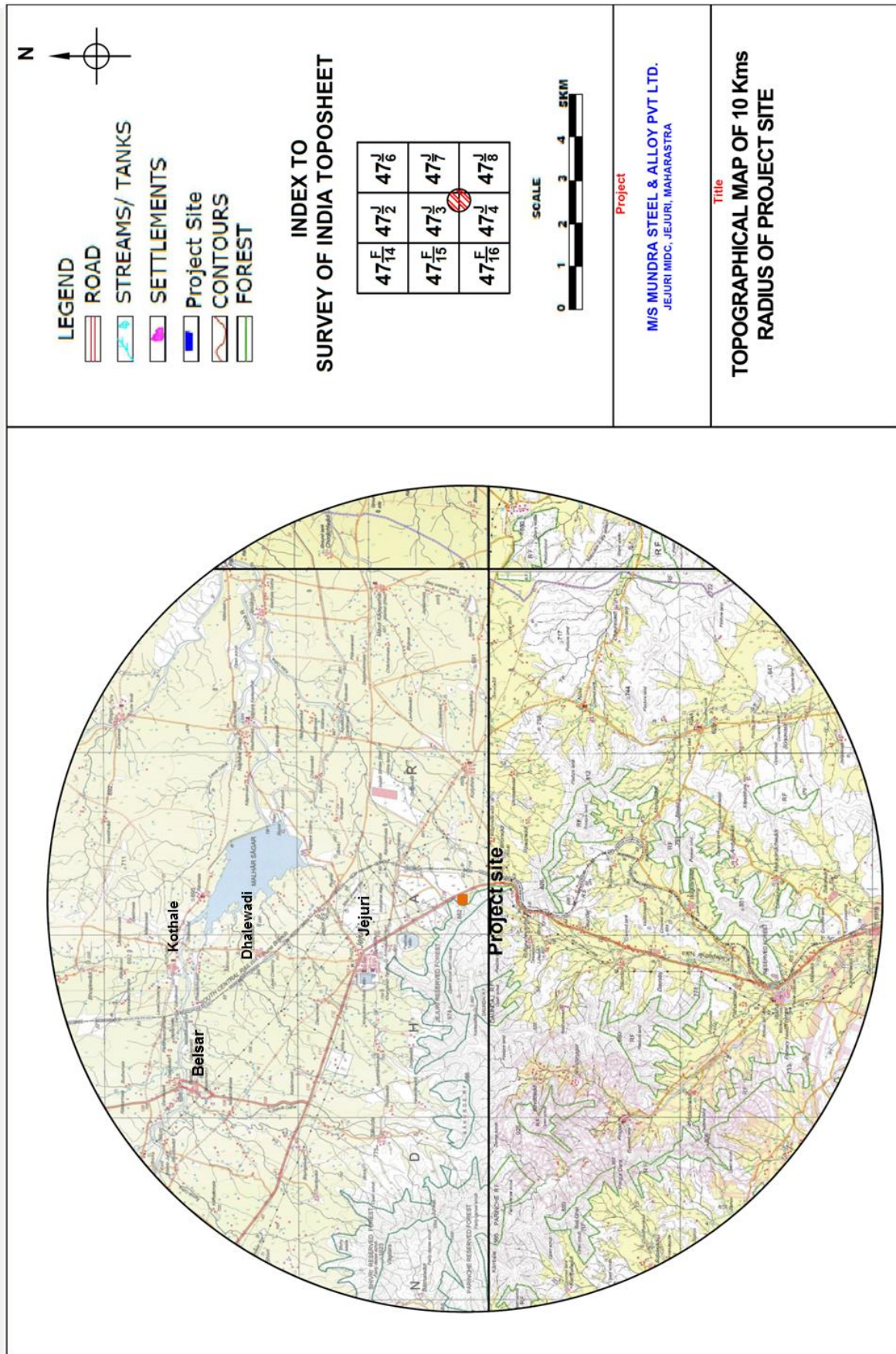

Figure 1: Project Location Map

Figure 2: 10 KM Study Area Map of the Project Site

2.0   PROJECT DESCRIPTION

2.1   Raw Material Requirement

The major raw materials for the proposed expansion are Sponge Iron, Scrap and Other minerals. The raw material requirement for the production of billets is formulated based on the working days of the plant. The working days of the plant are 360 days per year. The raw material requirement per day is given in **Table 1**

Table 1: Total Raw Material Requirement after Expansion

S. No.	Raw Materials	Quantity (MTPA)[3]	Source
1	Sponge Iron	225	Open Market
2	Scrap	338	Open Market
3	Other Minerals	17	Open Market

2.1.1 Material Balance

The material balance is given in **Table 2.**

Table 2: Material Balance for Billets

Input	TPD	Out Put	TPD
Sponge Iron	225	Billets	563
Scrap	338	Slag	17
Other Minerals	17	Total	580
Total	**580**	**Total**	**580**

2.2   Water Requirement

The manufacturing process of proposed project does not require water at any stage. The water requirement in the project will be for cooling purpose, domestic consumption and green belt development. Total initial water requirement for the project will be 163 KLD. This requirement will be met from Local Supplier. The details of water requirement for different purposes are presented in **Table 3.**

Table 3 : Water Requirement

All values in KLD

Item	Water Requirement	Losses	Recirculation/ Recycle	Effluent Generation
Cooling and Thermo pack	120	48	72	0
Domestic Purpose	6	2	0	4*
Gardening	4*	4	0	0
Total	**130**	**54**	**72**	**4***

Water Balance

Fresh water requirement for cooling = 48 KLD

Domestic water requirement = 6.0 KLD

Domestic waste will be treated in STP.

Treated water will be used for Gardening Purposes.

Zero Discharge norms will be followed.

2.3 Land Requirement

MSAL has acquired 13826.0 sq.m of land. The proposed expansion activity will be established within the existing plant area only. The land breakup details are presented in **Table 4.**

Table 4: Land Break-up Details

Sr. No.	Particular	Area (Sq.m)	Area in %
1	Ground Coverage	3285.08	23.76
2	Road Area	2725.92	19.71
3	Open Space Area	1456.36	10.53
4	Parking Area	1659.68	12.0
5	Greenbelt	4698.96	34.0
Total		**13826.0**	**100**

2.4 Power Requirement

The existing power requirement is 3.5 MW and additional 4.0 MW will be required for proposed expansion. The power will be sourced from the Maharashtra State Electricity Board. The details of Existing and proposed power requirement is given in **Table 5.**

Table 5: Power Requirement

S No	Particular	Quantity	Source
1	Existing	3.5 MW	Maharashtra State Electricity Board
2	Proposed	4.0 MW	
	Total	**7.5 MW**	

2.5 Man Power Requirement

The skilled/semiskilled /unskilled manpower required for the proposed expansion project. The man power requirement will be fulfilled from the surrounding villages, to help for the improvement of the socio economic status in the surrounding rural areas. The details of employment is given in **Table 6**

Table 6: Man Power Requirement

S No	Particular	Numbers
1	Existing Manpower (Staff + Worker)	05 + 50 = 55
2	Proposed Manpower(Staff + Worker)	10 + 50 = 60
	Total	**115 Nos.**

2.6 Technology and Process Description

The induction furnace operates as a batch melting process producing batches of molten steel known "heats". The furnace operating cycle is called the tap-to-tap cycle and is made up of the following operations:

- Furnace charging

- Melting

- Refining

- De-slagging

- Tapping

- Furnace turn-around

The process flow diagram is **Figure 3.**
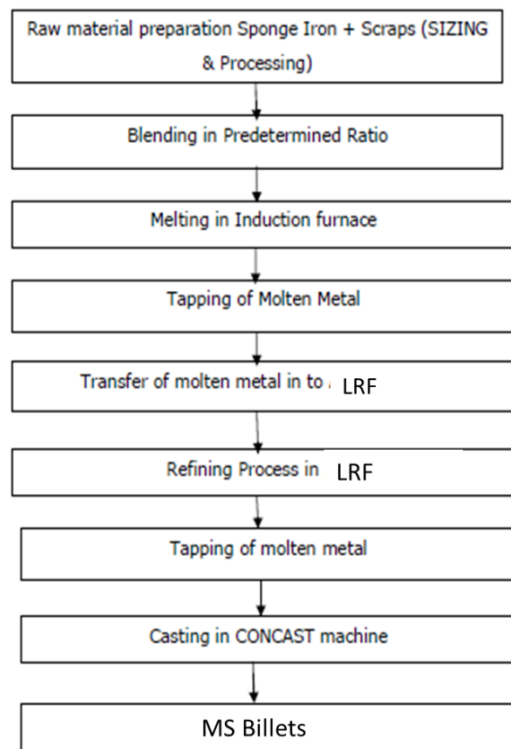
Figure: 3 -Manufacturing Process

3.0 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were conducted in the proposed project area and in the area within 10 km radius from the proposed expansion project area to assess the existing environmental scenario in the area. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, Land were monitored during March 2018 to May 2018 in the study area covering 10 km around the Plant area.

3.1   Meteorology

3.1.1 Summary of the Meteorological Data Generated at Site

The site Specific meteorological data is given in **Table -7 and** wind rose diagram is given in **Figure 4.**

Table 7: Site Specific Climatological Data (from March 2018 to May 2018)

Month	Temperature (ºC)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
March 2018	12.3	37.2	23	53	11.3
April 2018	17.1	42.3	25	49	6.7
May 2018	21.2	46.7	36	56	4.1
Total					22.1
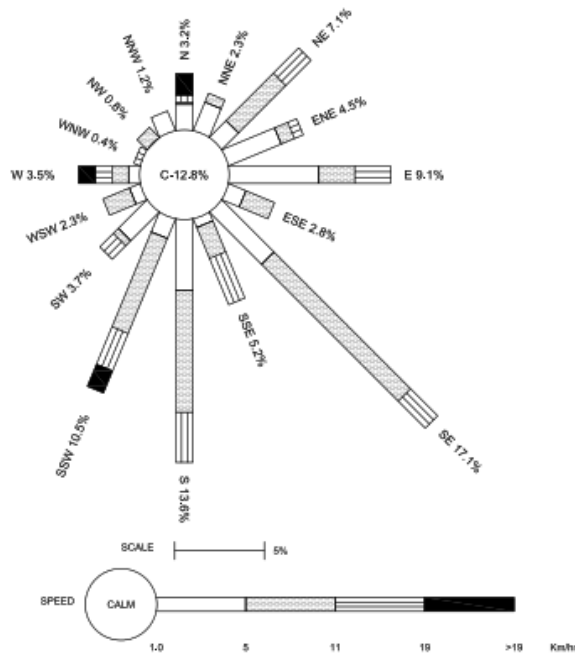
Figure 4: Windrose Diagram (Site Specific)

3.2   Ambient Air Quality Status

The status of ambient air quality within the study area was monitored for the period of during March 2018 to May 2018 at 8 locations including the Plant area and in nearby villages. Total 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind directions. The levels of Respirable Particulate Matter (PM_{10}), Fine Particulates ($PM_{2.5}$), Sulphur Dioxide (SO_2,) and Oxides of Nitrogen (NO_X) were monitored. The minimum and maximum values of monitoring results are summarized in **Table 8.**

Table 8: Summary of Ambient Air Quality Results
Particulate Matter – PM_{10}

All Values in µg/m³

Location Name	Minimum	Maximum	Average	98th Percentile
Project Site	68.4	72.2	70.1	72.1
Kolhire	58.4	62.6	60.7	62.3
Mavdikap	59.0	62.9	61.0	62.9
Kothale	57.1	60.7	58.7	60.5
Daundaj	55.8	61.4	58.6	61.2
Belsar	58.5	63.2	61.0	63.1
Sakurde	62.1	66.2	64.4	66.2
Jejuri	55.8	61.2	58.3	61.0

Particulate Matter – $PM_{2.5}$

10

All Values in µg/m³

Location Name	Minimum	Maximum	Average	98th Percentile
Project Site	26.9	32.2	29.8	32.1
Kolhire	24.0	27.9	26.2	27.8
Mavdikap	24.4	28.4	26.5	28.1
Kothale	22.7	26.8	25.5	26.7
Daundaj	25.0	27.3	26.2	27.1
Belsar	23.9	27.9	26.5	27.8
Sakurde	24.1	28.0	26.4	28.0
Jejuri	24.3	28.0	26.3	27.8

Sulphurdioxide - SO_2

All Values in µg/m³

Location Name	Minimum	Maximum	Average	98th Percentile
Project Site	16.7	19.1	18.1	19.0
Kolhire	14.8	17.5	16.3	17.5
Mavdikap	15.3	17.7	16.5	17.5
Kothale	14.9	17.6	16.1	17.5
Daundaj	14.1	17.3	15.6	17.0
Belsar	14.6	17.1	15.9	17.0
Sakurde	16.0	18.5	17.3	18.5
Jejuri	14.2	17.4	15.7	17.1

Oxides of Nitrogen – NOx

All Values in µg/m³

Location Name	Minimum	Maximum	Average	98th Percentile
Project Site	21.3	24.0	22.7	24.0
Kolhire	19.2	22.1	20.6	22.0
Mavdikap	19.4	22.0	20.7	21.8
Kothale	18.9	21.7	20.2	21.7
Daundaj	18.1	21.6	19.8	21.3
Belsar	18.9	21.7	20.4	21.7
Sakurde	20.1	23.4	21.6	23.1
Jejuri	18.2	21.7	20.0	21.5

Carbon Monoxide – CO

All Values in mg/m³

Location Name	Minimum	Maximum	Average	98th Percentile
Project Site	0.2	0.5	0.4	0.5
Kolhire	0.10	0.29	0.21	0.29
Mavdikap	0.10	0.30	0.21	0.30
Kothale	0.19	0.38	0.26	0.38
Daundaj	0.10	0.29	0.19	0.29
Belsar	0.10	0.30	0.21	0.30
Sakurde	0.20	0.40	0.30	0.40
Jejuri	0.10	0.30	0.20	0.30

From the above results, it is observed that the ambient air quality with respect to PM_{10}, $PM_{2.5}$, SO_2 and NOx at all the monitoring locations was within the permissible limits specified by CPCB.

3.3 Ambient Noise Levels

Ambient noise level monitoring was carried out at the 8 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 9.**

Table 9: Summary of Ambient Noise Level Monitoring Results [Leq in dB(A)]

Equivalent Noise levels	Project Site	Kolhire	Mavdikap	Kothale	Daundaj	Belsar	Sakurde	Jejuri
L_d	63.3	50.1	51.3	48.7	50.8	49.3	52.6	51.4
L_n	56.7	43.4	43.7	42.6	44.4	42.5	43.2	43.8
CPCB	75	55	55	55	55	55	55	55
L	70	45	45	45	45	45	45	45

L_d	: Day Equivalent
L_n	: Night Equivalents

Conclusion

The Maximum Noise (day) value was observed 63.3 dB(A) and the minimum noise (day) valve was observed 48.7 dB(A). The Maximum Noise (night) value was observed 56.7 dB(A) and the minimum noise (night) valve was observed 42.5 dB(A).

3.4   Surface and Ground Water Resources & Quality

Surface Water

- pH of the ground water samples collected was in the range of 7.88.

- Total Dissolved Solids in the samples was in the range of 522 mg/l.

- Total Hardness was found to vary between 267 mg/l.

The heavy metal contents are found to be negligible. Water quality is excellent but it is not potable due to presence of coliform. It can be used for drinking purpose after installing bacteriological treatment devices at individual or at community level.

Ground Water

Sampling was carried out at 8 locations during the study period. Sampling and analysis was carried out, as per standard methods and frequency of the sampling was thrice/stations. The summary of the results are presented below: pH in ground water sample was observed to be in the range 6.55 to 8.14 while conductivity was observed in the range of 751- 1314 μS/cm. The value of alkalinity and hardness were observed in the range of 147 – 244 mg/l and 276 to 406mg/l respectively. Whereas the heavy metals were found to be within the limits.

3.5   Land use Land Cover classification

The Land Cover classes and their coverage are summarized in **Table 10**.

Table 10: LU/LC Classes and their Coverage in SQ. km of 10 km Radius)

S. No.	Particular	Area (ha.)	PGA *** (%)
1	Water body	328.68	1.0
2	Settlement	522.68	2.0
3	Open Forest	909.99	3.0
4	Fallow Land	4217.29	13.0
5	Barren Scrub	10922.76	34.0
6	Agriculture Land	14971.85	47.0
	Total	**31873.25**	**100**

3.6   Soil Quality

Sampling was carried out at 8 locations during the study period. The summary of the results are presented below:

- pH in soil sample was observed in the range 7.44 to 8.51.

- Organic Matter was observed in the range of 0.32 -0.78%.

3.7   Biological Environment

Rare and Endangered Flora in the Study Area

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity. **Among the enumerated flora in the study area, none of them were assigned any threat category, by RED data book of Indian Plants.**

3.8   Socio-economic Environment

Information on socio-demographic status and the trends of the communities in the 10 km radius was collected through primary social survey and secondary data from census 2011 & village directory 2011. Summary of the socio-economic status of the study area is given in **Table 7.**

Table 7: Population Details

S.No.	Particulars	0-10km
1	Number of households	11416
2	Male population	26611
3	Female population	25684
4	Total population	52295
5	SC population	4182
6	ST population	2090
7	Total population (0-6 years)	5559
8	Average household size	4.58
9	% of males to the total Population	50.88
10	% of females to the total population	49.12

4.0   IMPACT ASSESSMENT AND MITIGATION MEASURES

4.1   AIR Pollution

The air quality modeling has been done and the details are given below:

24 Hourly Concentrations	Particulate Matter (PM) ($\mu g/m^3$)	Oxides of Nitrogen (NOx) ($\mu g/m^3$)
Baseline Scenario (Max)	72.2	24.0
Predicted Ground Level Concentration (Max)	1.22	2.43
Overall Scenario	**73.42**	**26.43**
NAAQ Standards	**100**	**80**

Mitigation Measures

Following measures will be taken to control air/fugitive pollution during operation:

- Stack height would be approx. 30 m (2 nos.) for gaseous emission confirming to the CPCB norms. D. G. Sets, stack height of 3.0 m above the roof level will be maintained.

- Stack emission level will be kept within permissible limit by installation of Fume extraction system with ventury scrubber and online stack emission monitoring will be done.

- Ambient air quality and stack emission would be regularly monitored and effective control exercised, so as to keep limits on stack emission loads would be met honestly at all the time.

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

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

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

4.2   Water Quality Management

The total water requirement of the plant is 130 KLD and fresh water requirement will be 48.0 KLD for cooling and 4.0 KLD for domestic purposes. The water will be mainly used for furnace cooling purpose, greenbelt, dust suppression and domestic purpose only. Cooling water will be continuously recalculated in the cooling circuit and domestic effluent is sent to septic tank followed by soak pit. The water is supplied for cooling water in Induction Furnace. The water

for other areas i.e. for greenbelt, dust suppression and domestic use is supplied directly. However, the Plant will be designed for Zero Discharge from the operations.

4.3   Noise Pollution Control

Noise level at the plant boundary, calculated from the above equation, is expected to be less than 60 dB (A) without considering any attenuation factors.

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

i.   Time to time oiling and servicing of machineries will be done.

ii.   Acoustic enclosure for Turbine and D.G. sets will be provided.

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

4.4 Greenbelt Development and Plantation

About 33% of the total Plant area will be developed as green belt.

4.5 Solid and Hazardous Waste Generation and Management

The details of solid waste generation are given below:

Sr. No.	Particular	Existing (TPD)	After Expansion (TPD)	Management
1	Slag	2.0	15.0	17.0

4.6   EMP and CER Details

Details of environment management plan are given in **Table 11** and **CER in Table 12.**

Table 11: EMP Budget

S. No	Environmental Aspect	Capital Expenditure (Rs. Lacs)	Recurring Expenditure (Rs. Lacs)
1	Air pollution control device, Chimney, water cooling, insulation etc	72.00	05.50
2	Wastewater Management	02.70	01.20
3	Green Belt development	01.00	00.75
4	Occupational Health & Safety	03.00	01.00
5	Solid Waste Management	12.00	04.00
6	Environmental Cell & Monitoring	4.00	02.00
	Total	**94.70**	**14.45**

Table 12: CER Budget

Activity Identified	CER Budget INR (Lakhs)
Health Camps	5.0
Skill Development programmes	5.0
Setting up a Library and Career Counseling Center	5.0
Drinking water facility	5.0
Total	**20.0**

5.0   CONCLUSION

As discussed, it is safe to say that the project is not likely to cause any significant impact on the ecology of the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released from the premises of the project.