

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. Nilanjan Iron Pvt. Ltd. submitted the application for Environmental Clearance as per the new notification along with prescribed Form1, proposed Terms of Reference for EIA study and pre-Feasibility report. The Expert Appraisal Committee considered the project in 157th Meeting on 02nd November 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 (100 TPD to 500 TPD) at Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur, Maharashtra. Total land is available with NIPL is 10174.0 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 (MS Ingots/MS Billets)	12 MT x 9 Heats = 100 TPD
Proposed Furnace (New Installation)	
Induction Furnace (MS Ingots/MS Billets)	20 MT x 13 Heats = 260 TPD
	20 MT x 14 Heats = 280 TPD
	Total = 500 TPD

Project Proponents

Nilanjan Iron Private Limited is a Private incorporated on 14th July 2005. It is classified as Non-Govt. Company and is registered at Registrar of Companies, Goa. Its authorized share capital is INR 60,000,000 and its paid up capital is INR 50,500,000. It is involved in Manufacture of Basic Iron & Steel.

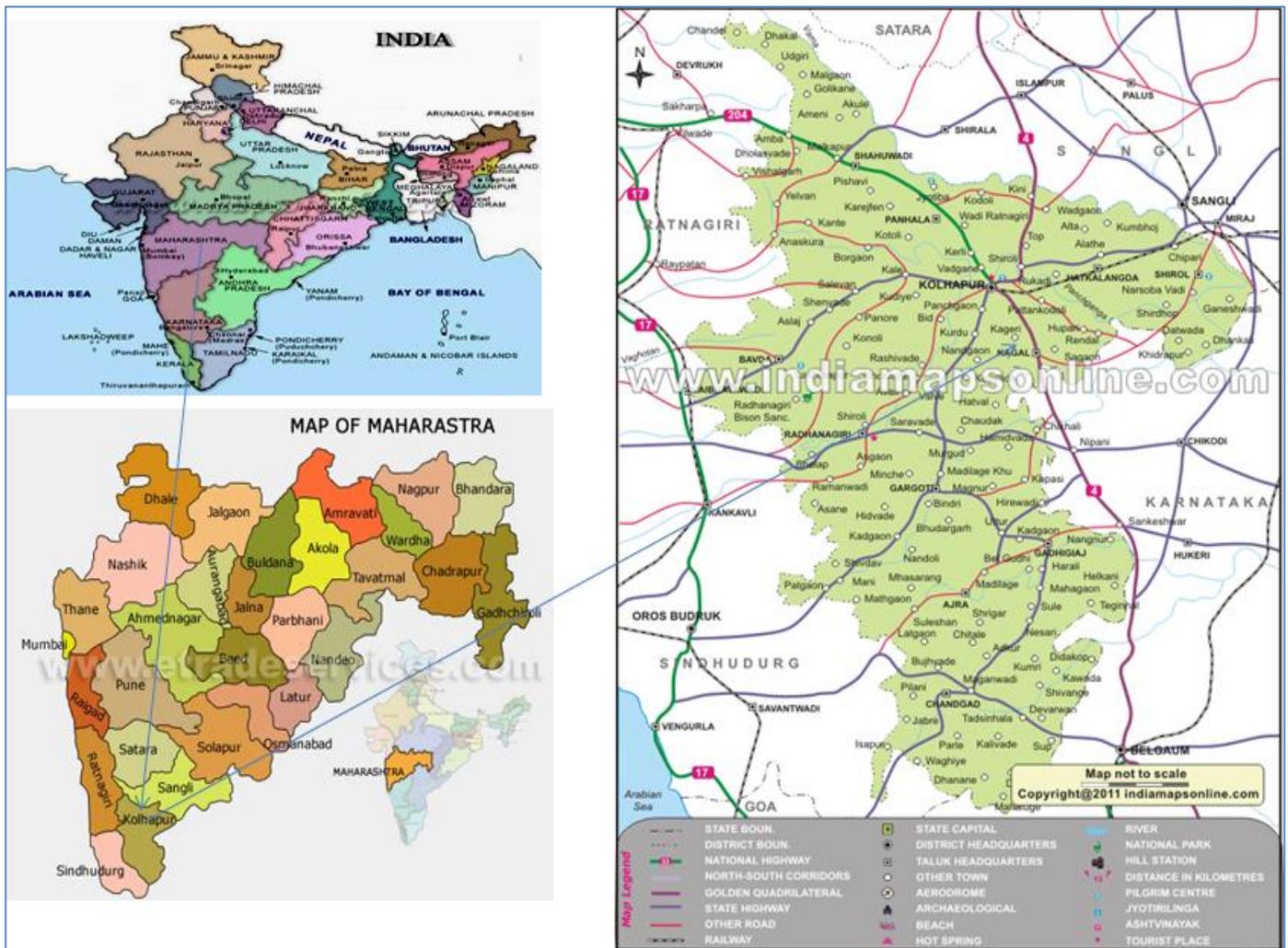


Figure 1: Project Location Map

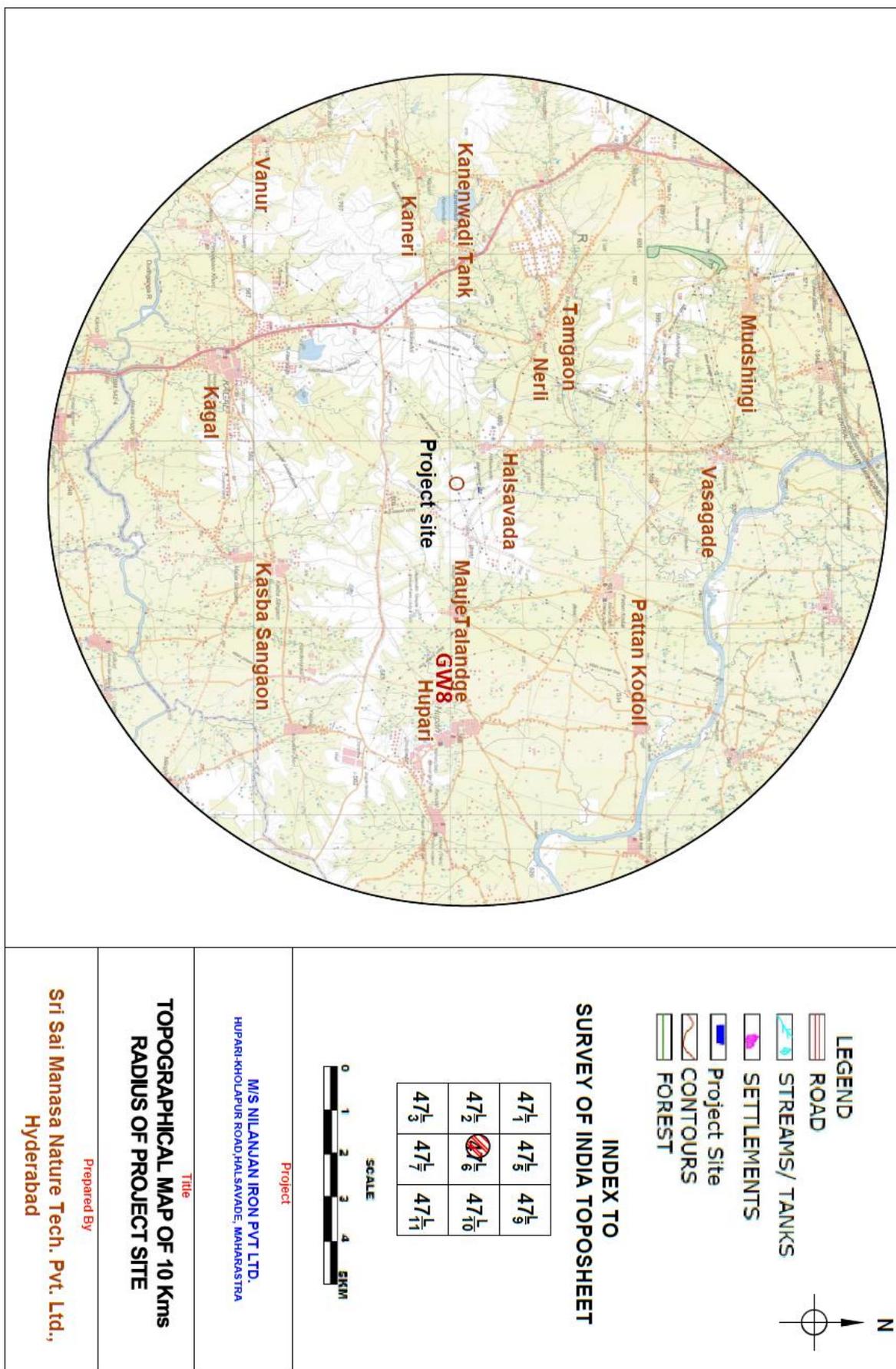


Figure 2: 10 KM Study Area Map of the Project Site

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)	Source
1	Sponge Iron	200	Open Market
2	Metal Scrap	300	Open Market
3	Other Minerals	15	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	200	Billets	500
Metal Scrap	300	Slag	15
Other Minerals	15	Total	515
Total	515		

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
Industrial Cooling	150	60	90	0
Domestic Purpose	8	3	0	5*
Gardening	5*	5	0	0
Total	163	68	90	5*

Water Balance

Fresh water requirement for cooling = 90 KLD

Domestic water requirement = 8.0 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

NIPL has acquired 10174.0 sq.m of land under notified industrial area. 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	Built-up Area	3367.71	33.11
2	Road Area	864.0	8.5
3	Open Space Area	1121.53	11.02
4	Parking Area	1363.97	13.4
5	Greenbelt	3456.79	33.97
Total		10174.0	100

2.4 Power Requirement

The existing power requirement is 5.0 MW and additional 5.0 MW will be required for proposed expansion. The power will be sourced from the Maharashtra State Electricity Board. 2.0 nos. DG sets with a capacity of 500 kVA each will also be provided for emergency purposes. The details of Existing and proposed power requirement is given in **Table 5**.

Table 5: Power Requirement

S No	Particular	Quantity	Source
1	Existing	5.0MW	Maharashtra State Electricity Board
2	Proposed	5.0 MW	
	Total	10.0 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)	10 + 60 = 70
2	Proposed Manpower(Staff + Worker)	10 + 100 = 110
	Total	180 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**.

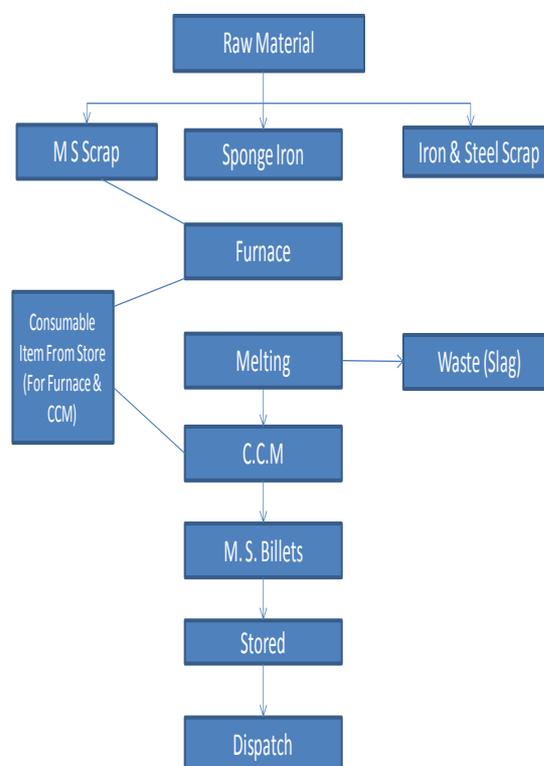


Figure: 3 -Manufacturing Process

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 October 2018 to December 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 October 2018 to December 2018)

Month	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
October 2018	19.8	31.7	48	53	44.6
November 2018	17.9	29.8	44	48	29.7
December 2018	15.0	29.1	30	37	13.2
Total					87.5

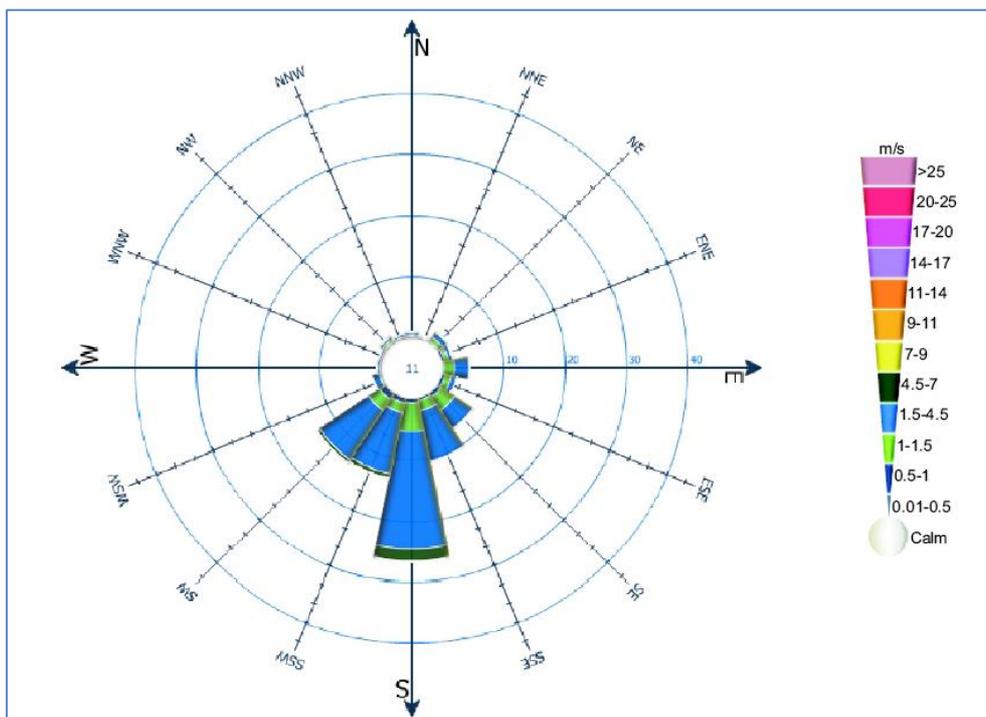


Figure 4: Windrose Diagram (Site Specific)

3.2 Ambient Air Quality Status

The status of ambient air quality within the study area was monitored for the period of during October 2018 to December 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 (PM₁₀), Fine Particulates (PM_{2.5}), Sulphur Dioxide (SO₂) 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 – PM₁₀**

Location Name	Minimum	Maximum	Average	All Values in µg/m ³
				98 th Percentile
Project Site	73.4	81.5	77.4	81.1
Halsavade	52.2	59.6	55.5	59.3
Tamgaon	51.3	64.0	58.3	63.3
Vasagade	46.1	53.7	50.3	53.7
Pattankodli	43.8	53.1	49.4	53.1
Kanheri	40.5	47.7	44.2	47.5
Kagal	59.5	67.3	64.5	67.3
Talgande	64.7	74.7	69.9	74.6

Particulate Matter – PM_{2.5}

Location Name	Minimum	Maximum	Average	All Values in µg/m ³
				98 th Percentile
Project Site	30.7	33.8	32.2	33.6
Halsavade	20.3	22.7	21.6	22.7
Tamgaon	20.3	25.0	22.7	24.8
Vasagade	17.5	21.5	20.1	21.4
Pattankodli	17.4	21.3	19.4	21.1
Kanheri	15.5	17.8	16.8	17.8
Kagal	23.9	27.5	26.0	27.4
Talgande	26.0	30.5	28.1	30.4

Sulphurdioxide - SO₂

Location Name	Minimum	Maximum	Average	All Values in µg/m ³
				98 th Percentile
Project Site	12.6	14.0	13.2	13.9
Halsavade	13.3	15.2	14.2	15.2
Tamgaon	14.1	17.4	15.4	17.2
Vasagade	10.2	12.8	11.9	12.8
Pattankodli	10.8	13.2	12.0	13.1
Kanheri	10.1	11.8	11.0	11.7
Kagal	12.3	14.3	13.3	14.2
Talgande	12.6	14.8	13.7	14.7

Oxides of Nitrogen – NOx

All Values in $\mu\text{g}/\text{m}^3$

Location Name	Minimum	Maximum	Average	98 th Percentile
Project Site	15.3	16.9	16.1	16.8
Halsavade	16.2	18.4	17.4	18.3
Tamgaon	16.9	20.8	18.5	20.6
Vasagade	13.0	16.0	14.9	15.9
Pattankodli	13.6	16.4	14.9	16.4
Kanheri	13.2	14.4	13.8	14.3
Kagal	14.9	17.4	16.0	17.3
Talgande	15.8	18.7	17.1	18.4

Carbon Monoxide – CO

All Values in mg/m^3

Location Name	Minimum	Maximum	Average	98 th Percentile
Project Site	0.53	0.72	0.65	0.72
Halsavade	<0.1	<0.1	<0.1	<0.1
Tamgaon	<0.1	<0.1	<0.1	<0.1
Vasagade	<0.1	<0.1	<0.1	<0.1
Pattankodli	<0.1	<0.1	<0.1	<0.1
Kanheri	<0.1	<0.1	<0.1	<0.1
Kagal	<0.1	<0.1	<0.1	<0.1
Talgande	0.22	0.23	0.18	0.22

From the above results, it is observed that the ambient air quality with respect to PM₁₀, PM_{2.5}, SO₂ 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	Halsavade	Tamgaon	Vasagade	Pattankodli	Kanheri	Kagal	Talgande
L _d	69.4	54.1	53.2	54.7	51.3	50.6	54.8	53.9
L _n	65.7	44.6	43.1	55.3	44.2	42.3	44.5	44.1
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 69.4 dB(A) and the minimum noise (day) value was observed 50.6 dB(A). The Maximum Noise (night) value was observed 65.7 dB(A) and the minimum noise (night) value was observed 43.1 dB(A).

3.4 Surface and Ground Water Resources & Quality

Surface Water

- pH of the ground water samples collected was in the range of 7.07 – 8.0.
- Total Dissolved Solids in the samples was in the range of 418 – 851 mg/l.
- Total Hardness was found to vary between 117 – 441 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 8.11 to 8.32 while conductivity was observed in the range of 326- 448 μ S/cm. The value of alkalinity and hardness were observed in the range of 101.7 – 180.3 mg/l and 124 to 232 mg/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	568.71	1.8
2	Settlement	3235.68	10.28
3	Open Scrub	2171.34	6.9
4	Fallow Land	2872.08	9.12
5	Agriculture Land	22610.74	71.9
	Total	31458.55	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 7.14 to 8.22.
- Bulk density was observed in the range of 1.16 -1.36 g/cc.

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	0-2km	2-5km	5-10km	0-10km
1	Number of households	1804	5777	23576	31157
2	Male population	3861	14123	47631	65615
3	Female population	3717	13411	47606	64734
4	Total population	7573	27533	95232	130338
5	SC population	1584	4627	19241	25452
6	ST population	1160	2584	9883	13627
7	Total population(0-6 years)	677	3441	8802	12920
8	Average household size	4.2	4.2	4.0	4.1
9	% of males to the total Population	51.0	51.3	50.0	50.3
10	% of females to the total population	49.0	48.7	50.0	49.7

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) ($\mu\text{g}/\text{m}^3$)	Oxides of Nitrogen (NO _x) ($\mu\text{g}/\text{m}^3$)
Baseline Scenario (Max)	81.5	20.8
Predicted Ground Level Concentration (Max)	1.02	2.05
Overall Scenario	82.42	22.85
NAAQ Standards	100	80

Mitigation Measures

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

- Stack height would be approx.. 40 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 163 KLD and fresh water requirement will be 90.0 KLD for cooling and 8.0 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 recirculated 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	3.0	15.0	Sold to Brick Manufactures
2	Used Oil	1.0	2.0	Sold to Board Authorized Vendor

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	80.00	15.00
2	Wastewater Management	03.50	0.80
3	Green Belt development	03.00	01.00
4	Monitoring	06.00	03.50
5	Occupational Health safety Management	03.00	01.00
6	Solid Waste Management	15.00	04.00
	Total	110.50	25.30

Table 12: CER Budget

Activity Identified	CER Budget INR (Lakhs)
Plantation in surrounding Villages	5.0
Environmental Awareness Program	2.5
Solid waste management	2.5
Total	10.0

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.
