

## **EXECUTIVE SUMMARY**

**For**

**Expansion of ferro-alloys plant by adding additional 3 x 12.5 MVA submerged arc furnace and new products i.e., Fe moly, Fe Titanium, Fe Vanadium, Fe Boron, McFeMn, LcFeMn, Fe Niobium, Cored Wire and FeSiZr, at Gollapuram village, Hindupur Mandal, Ananthapuram Dist., Andhra Pradesh (India)**

**Project Proponent:**

**M/S. Oswal Smelter Pvt. Ltd.,**

**Sy. No. 31-1, 2, 3,32-1A, 2B, 37-2, 38-1, 2 & 48-1 village- Gollapuram,  
Mandal Hindupuram, District Ananthapuram, Andhra Pradesh**

## **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 proposed ferroalloys expansion project is categorized as Category – A project, which mandates obtaining prior Environmental Clearance from MoEFCC, GOI, NEW DELHI.

#### **1.2 Terms of Reference**

M/s Oswal Smelters (P) Ltd. (OSPL) 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 on the project in 15<sup>th</sup> February 2018. The Expert Appraisal Committee considered the project in the 28<sup>th</sup> meeting held on March 12<sup>th</sup> to 14<sup>th</sup>, 2018 and prescribed Terms of References is incorporated in the EIA report.

#### **1.3 Brief Description of Project**

The proposed project is expansion in production of ferroalloys adding 3 x 12.5 MVA submerged Electrical Arc Furnace. After expansion total Furnace capacity will be 1 X 9 MVA & 3x12.5 MVA. The project is located at Sy. No. 31-1, 2, 3, 32-1A, 2B, 37-2, 38-1, 2 & 48-1, Village Gollapuram, Hindupur Mandal, District Ananthapuram, Andhra Pradesh. The project location map is given in **Figure 1.1**, and 10 km study area map is given in **Figure 1.2**.

#### **Product Details**

<b>Sr. No.</b>	<b>Particular</b>	<b>Existing (TPA)</b>	<b>Proposed (TPA)</b>	<b>Total (TPA)</b>
1	Ferro Manganese or	18500	43200	61700
2	Silico Manganese or	14000	36000	50000
3	Ferro Silicon	8000	25200	33200
4	Fe Moly	-	1200	1200
5	Fe Titanium	-	1200	1200
6	Fe Vanadium	-	1200	1200

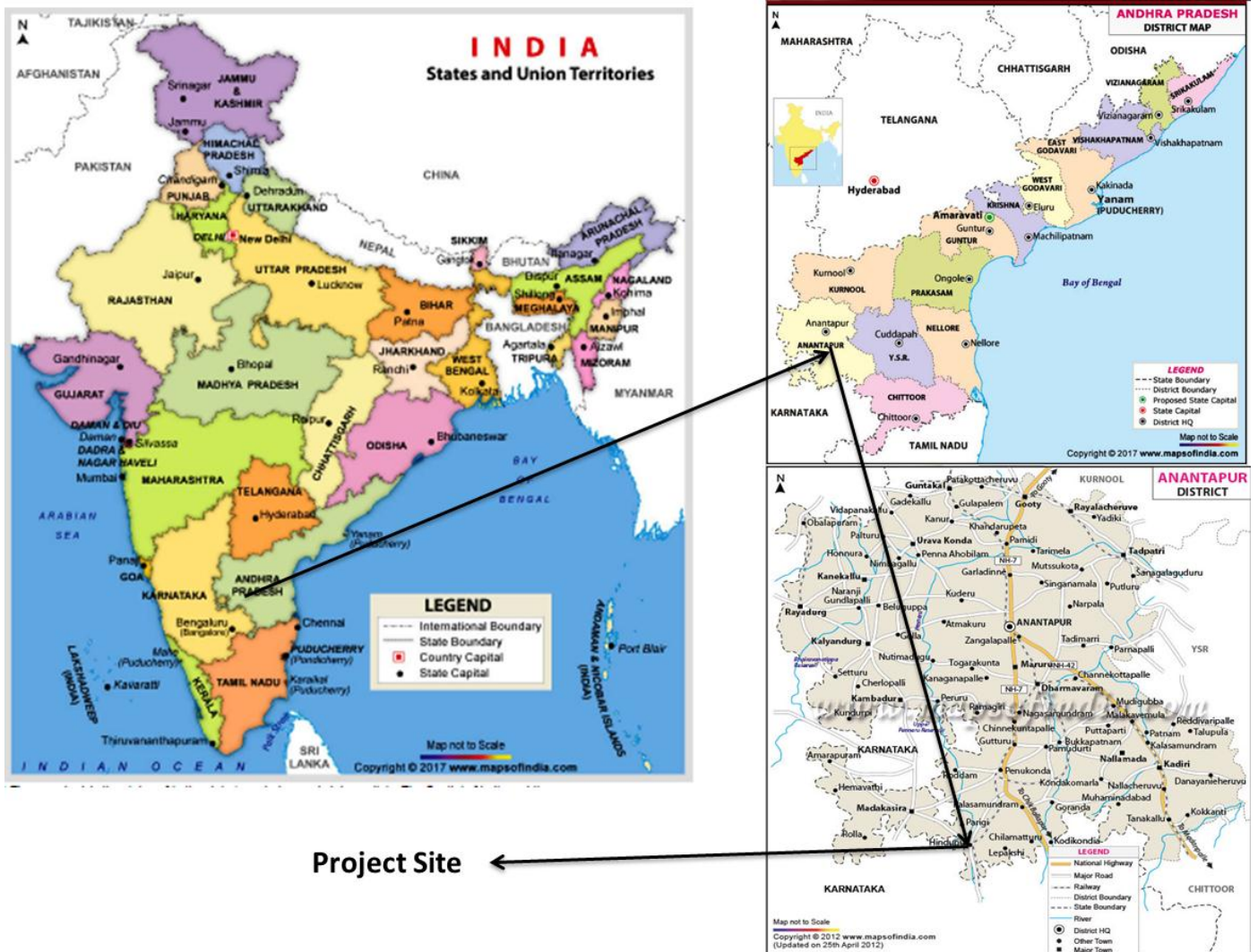
**Expansion in Production of Ferroalloys Unit by Adding 3 x 12.5 MVA submerged Arc Furnace and new products i.e., Fe moly, Fe Titanium, Fe Vanadium, Fe Boron, McFeMn, LcFeMn, Fe Niobium, Cored Wire, FeSiZr  
M/s Oswal Smelters (P) Ltd.**

7	Fe Boron	-	1200	1200
8	Mc FeMn	-	3000	3000
9	Lc FeMn	-	3000	3000
10	Fe Niobium	-	1200	1200
11	Cored Wire	-	4000	4000
12	FeSiZr	-	1000	1000

**Project Proponents**

The project proponents are M/s Oswal Smelters (P) Ltd., incorporated in 2007 under companies Act 1956 with their registered office at # 1034, 3rd Floor, 1st Main Road, Dr. Rajkumar Road, 4th Block, Rajajinagar, Bengaluru-560 010.

**Expansion in Production of Ferroalloys Unit by Adding 3 x 12.5 MVA submerged Arc Furnace and new products i.e., Fe moly, Fe Titanium, Fe Vanadium, Fe Boron, McFeMn, LcFeMn, Fe Niobium, Cored Wire, FeSiZr M/s Oswal Smelters (P) Ltd.**



**Figure 1: Project Location Map**



Expansion in Production of Ferroalloys Unit by Adding 3 x 12.5 MVA submerged Arc Furnace and new products i.e., Fe moly, Fe Titanium, Fe Vanadium, Fe Boron, McFeMn, LcFeMn, Fe Niobium, Cored Wire, FeSiZr  
M/s Oswal Smelters (P) Ltd.

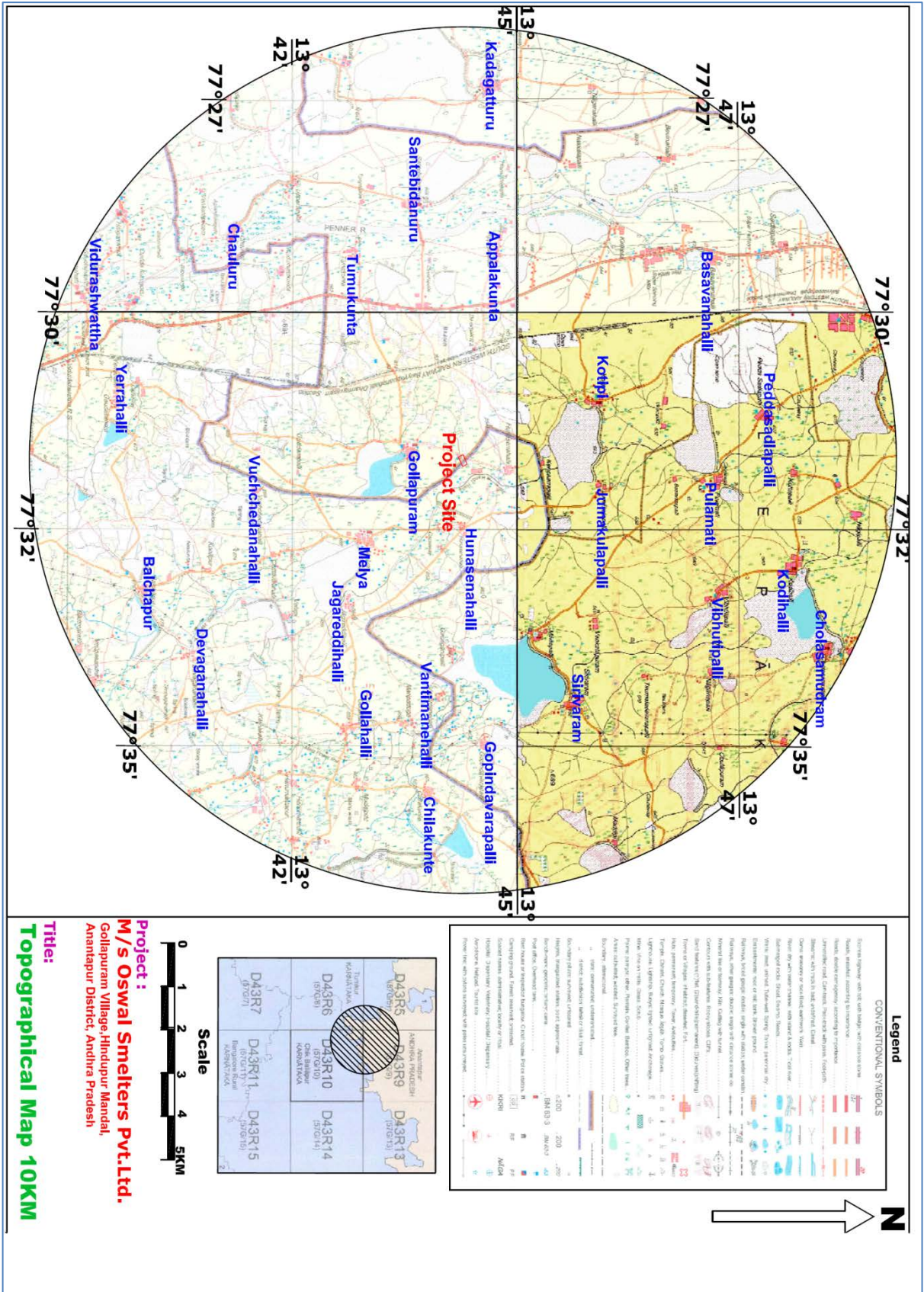


Figure 2: 10 KM Study Area Map of the Project Site

## 2.0 PROJECT DESCRIPTION

### 2.1 Raw Material Requirement

The raw materials required for the production of Ferro-manganese and Silico-manganese are:

- Manganese ore,
- Ferro-manganese slag,
- Quartz,
- Dolomite,
- Coal
- Coke

The working days of the plant are 330 days per year. The raw material requirement per day is given in **Table 1**.

**Table 1: Raw Material Characteristics**

Description	Physical	Chemical
Manganese Ore	Size : 6-50mm Size : 6-75mm Moisture : 5% max	Mn : 44% Al <sub>2</sub> O <sub>3</sub> : 5% SiO <sub>2</sub> : 6% MgO : 1.3% P : 0.6% S : 0.005% CaO : 0.6%
Ferro-manganese Slag (generated in Ferro - manganese process)	Size : 25 - 75mm Moisture : 0.5% max	MnO : 32.0 – 35.0% FeO : 0.8% Al <sub>2</sub> O <sub>3</sub> : 10.5% SiO <sub>2</sub> : 30.0% CaO : 10.0% MgO : 9.0%
Dolomite	Size : 25 - 50mm Moisture : 0.5% max	MgO : 21.0% CaO : 31.0% SiO <sub>2</sub> : 0.8%
Quartz	Size : 25 - 50mm Moisture : 0.5% max	SiO <sub>2</sub> : 97.0%

### 2.2 Material Balance

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

**Table 2: Ferro Manganese**

S. No.	Components	Quantity
1	Manganese Ore High Grade	1000 Kgs.
2	Manganese Ore Low Grade	1200 Kgs.
3	Ferro Manganese Slag	500 Kgs.
4	Coke	400 Kgs.
5	Coal	400 Kgs.
6	Quartz	200 Kgs.
7	Dolomite	200 Kgs.

### Source of Raw Materials

Ore & Metal Company Limited/Open Market

## 2.3 Utilities

### Water Requirement

The manufacturing process of Ferro Alloys does not require water at any stage. The water requirement in the Project will be for cooling purpose, domestic consumption and green belt development. The existing unit requires 94 KLD of water and second phase (proposed phase) requires 160 KLD of water. Total initial water requirement for the project will be 254 KLD. This requirement will be met from APIIC Growth Centre. The details of water requirement for different purposes are presented in **Table 3**.

**Table 3: Water Requirement**

Item	Water Requirement in KLD (1 x 9 MVA)	Water Requirement in KLD (3 x 12.5 MVA)	Total Water Requirement (KLD)
Cooling Purpose	84	150	234
Domestic Purpose	10	10	20
Dust Suppression			
Greenbelt			
<b>Total</b>	<b>94</b>	<b>160</b>	<b>254</b>

M/s Oswal Smelters (P) Ltd has acquired 35.7 acres of land in Growth Center APIIC. The proposed expansion activity will be established within the existing plant area only.

### Water Balance

There is no generation of process wastewater in the proposed project. Cooling water is continuously re-circulated in the cooling water circuits, heat exchangers and discharged to the sump or holding tank cooling towers where evaporation losses drift losses and spillages are

encountered. Domestic waste water will be sent to the septic tank followed by soak pit. Zero Discharge norms will be followed.

#### **Land Requirement**

M/s Oswal Smelters (P) Ltd has acquired 35.7 acres of land in Growth Center APIIC. 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**

<b>S No</b>	<b>Particular</b>	<b>Existing (Acres)</b>	<b>Proposed (Acres)</b>	<b>After Expansion (Acres)</b>
1	Plant and Machinery	4.6	6.0	10.6
2	Greenbelt	12.2	-	12.2
3	Open/Future Expansion	18.9	-	<b>12.9</b>
	<b>Total</b>	<b>35.7</b>	<b>6.0</b>	<b>35.7</b>

#### **Power Requirement**

The existing power requirement is 9.0 MVA and additional 40.5 MVA will be required for proposed expansion. The power will be sourced from the Eastern Power Distribution Company of Andhra Pradesh Limited.

#### **Man Power Requirement**

The skilled/semiskilled /unskilled manpower required for the proposed Project is estimated is 300 nos. and the existing Man Power is 110. 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.

## **2.4 Technology and Process Description**

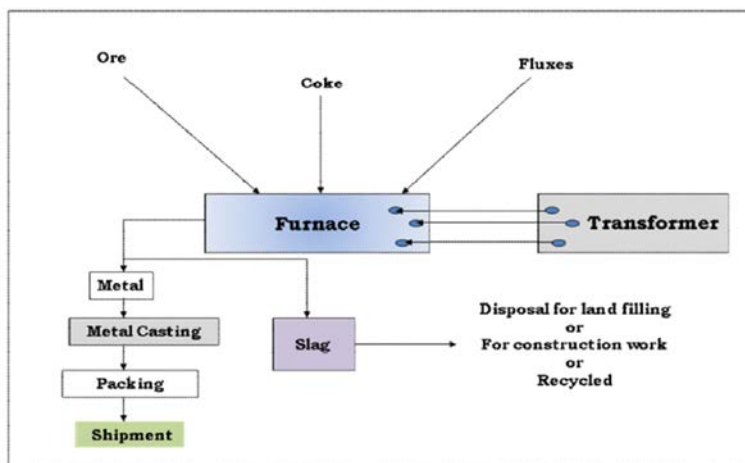
Most of the Ferro alloys e.g., Ferro Manganese and Silico Manganese are produced by smelting process. Smelting of the charged material is carried out in an electrical arc furnaces equipped with transformer of proper rating.

#### **Basic Process**

Ferro-alloys are produced by reducing metals from their oxides contained in ores by using a suitable reduction under conditions created to ensure a high recovery of the valuable elements from the starting materials. Such reduction reactions are characterized by stability of an oxide at high temperatures. The stability of all oxides will become more stable with increasing temperature. An element which forms a stronger oxide can under appropriate conditions be used as reductant for a less strong oxide. The reaction will proceed successfully if



the difference of oxygen involved with a small difference, favorable conditions should be formed to make the reaction proceed. The presence of iron or iron oxides can facilitate some reduction processes. Iron dissolves the reduced element, forms a compound with it, and thus lowers the melting point of an iron element alloy is lower than that of the pure element, e.g. in Ferro-manganese production, and therefore the reaction of reduction of the element can proceed at a lower temperature.



**Figure 3: Process Flow Chart of Ferro Alloy Project**

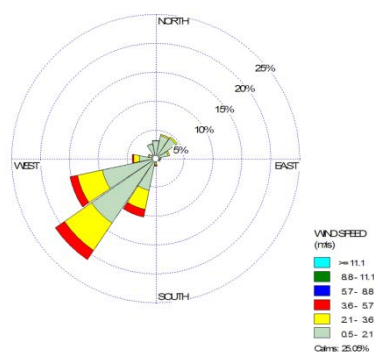
### 3.0 BASELINE ENVIRONMENTAL STUDIES

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 to May 2018 in the study area covering 10 km around the Plant area.

### 3.1 Meteorology & Ambient Air Quality

#### Summary of the Meteorological Data Generated at Site

#### Summary of Site Specific Wind Pattern



### 3.2 Ambient Air Quality Status

The status of ambient air quality within the study area was monitored for the period of March 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<sub>10</sub>), Fine Particulates (PM<sub>2.5</sub>), Sulphur Dioxide (SO<sub>2</sub>), and Oxides of Nitrogen (NO<sub>x</sub>) were monitored. The minimum and maximum values of monitoring results are summarized in **Table 6**.

**Table 6: Summary of Ambient Air Quality Results**

Name of Village (s)	PM <sub>10</sub> (µg/m <sup>3</sup> )			PM <sub>2.5</sub> (µg/m <sup>3</sup> )			SO <sub>2</sub> (µg/m <sup>3</sup> )		
	Min.	Max.	98 <sup>th</sup> %	Min.	Max.	98 <sup>th</sup> %	Min.	Max.	98 <sup>th</sup> %
Project Site	67.1	70.8	70.7	26.4	31.6	31.5	16.4	18.7	18.7
Hunasehalli Village	59.6	63.9	63.6	24.5	28.5	28.4	15.1	17.9	17.8
Gollapuram Village	59.6	63.5	63.5	24.6	28.7	28.4	15.5	17.9	17.7
Jumakulapalli Village	59.5	63.2	63.0	23.6	27.9	27.9	15.5	18.3	18.3
Sirivaram Village	57.5	63.3	63.1	25.8	28.1	27.9	14.5	17.8	17.5
Peddasadlapalli Village	57.9	62.6	62.5	23.7	27.6	27.6	14.5	16.9	16.9
Appalakunta Village	63.4	67.5	67.5	24.6	28.6	28.6	16.3	18.9	18.9
Chaluru Village	56.4	61.8	61.6	24.5	28.3	28.1	14.3	17.6	17.3
<b>CPCB Standards</b>	<b>100</b>			<b>60</b>			<b>80</b>		
Name of Village (s)	NO <sub>x</sub> (µg/m <sup>3</sup> )			Carbon Monoxide (CO) mg/m <sup>3</sup>					
	Min.	Max.	98 <sup>th</sup> %	Min.	Max.	98 <sup>th</sup> %			
Project Site	20.9	23.5	23.5	0.2	0.5	0.5			
Hunasehalli Village	19.6	22.6	22.5	0.1	0.3	0.3			
Gollapuram Village	19.6	22.2	22.1	0.1	0.3	0.3			
Jumakulapalli Village	19.7	22.6	22.6	0.2	0.4	0.4			
Sirivaram Village	18.7	22.3	21.9	0.1	0.3	0.3			
Peddasadlapalli Village	18.7	21.5	21.5	0.1	0.3	0.3			
Appalakunta Village	20.5	23.9	23.6	0.2	0.4	0.4			
Chaluru Village	18.4	21.9	21.7	0.1	0.3	0.3			
<b>CPCB Standards</b>	<b>80</b>			<b>4.0</b>					

From the above results, it is observed that the ambient air quality with respect to PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub> 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 7**.

**Table 7: Summary of Ambient Noise Level Monitoring Results [Leq in dB(A)]**

Equivalent Noise levels	Project Site	Hunasenahalli Village	Gollapuram Village	Jumakulapalli Village	Sirivaram Village	Peddasadlapalli Village	Appalakunta Village	Chaluru Village
L <sub>Max</sub>	69.5	58.9	57.3	56.5	55.9	55.2	57.9	55.2
L <sub>Min</sub>	46.9	37.2	38.2	38.3	37.6	36.5	38.4	36.8
L <sub>d</sub>	64.6	53.8	53.9	51.9	51.4	52.3	53.3	51.9
L <sub>n</sub>	52.8	41.9	42.6	41.4	41.5	41.0	41.9	41.2

### 3.4 Surface and Ground Water Resources & Quality

#### Groundwater

- pH of the ground water samples collected was in the range of 7.05 – 7.85.
- Total Dissolved Solids in the samples was in the range of 420 – 610 mg/l.
- Total Hardness was found to vary between 134.77 – 190.00 mg/l.
- Chlorides concentration was found to vary between 70.48 – 165.12mg/l.
- Fluoride concentration was found to vary between 0.15 – 0.34 mg/l.
- Sulphates concentration was found to vary between 22.5 – 48.6 mg/l.
- Heavy metal concentrations in all the samples were found to be well within the limits.

### 3.5 Land use Land Cover classification

The Land Cover classes and their coverage are summarized in **Table 8**.

**Table 8: LU/LC Classes and their Coverage in SQ. km of 10 km Radius)**

S. No.	Particular	Area (ha.)	PGA *** (%)
1	Settlement	18.311	6.0
2	Dense Forest	1487.65	5.0
3	Open Scrub	10010.98	30.0
4	Fallow Land	5463.58	16.0
5	Agriculture Land	14368.25	43.0
	<b>Total</b>	<b>33156.09</b>	<b>100</b>

### 3.6 Soil Quality

- The following are the highlights of soil quality in the study area are as follows Soil Samples within 10 km Radius
- PH of the soil samples were found to be in the range of 6.55 – 7.42
- Organic content of the soil samples was found to be medium exhibiting in the range of 0.23% - 0.53 % and average fertility.

### 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.** (Nayar and Sastry, 1990) and Red list of threatened Vascular plants (IUCN, 2010; BSI, 2003).

### 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 9.**

**Table 9: 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	7578	27534	95237	130349
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 MITIGATION MEASURES

#### 4.1 AIR Pollution Control Measures

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

- i. Stack height would be approx 30 m (4 nos.) for gaseous emission confirming to the CPCB norms. D. G. Sets, stack height of 3.0 m above the roof level will be maintained.
- ii. Stack emission level will be kept within permissible limit by installation of bag filter and online stack emission monitoring will be done.

- iii. Ambient air quality and stack emission would be regularly monitored and effective control exercised, so as to keep limits on stack emission loads would be met honestly at all the time.
- iv. 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.
- v. 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.
- vi. 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 proposed project would be based on “Zero Liquid Discharge” (ZLD)

#### **4.3 Noise Pollution Control**

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

- 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 plant site will be developed as green belt.

#### **4.5 EMP and CSR Details**

Details of environment management plan are given in **Table 10**.

**Table 10: EMP Budget**

<b>S. No</b>	<b>Item</b>	<b>Recurring Cost per annum (Lac)</b>	<b>Capital Cost (Lac)</b>
1	Air Pollution Control	6.0	2
2	Water Pollution Control	1.0	0.5
3	Noise Pollution Control	0.25	0.25
4	Environment Monitoring and Management	10.0	0.2
5	Occupational Health	5.0	0.2
6	Green Belt	1.0	0.3

*Expansion in Production of Ferroalloys Unit by Adding 3 x 12.5 MVA submerged Arc Furnace and new products i.e., Fe moly, Fe Titanium, Fe Vanadium, Fe Boron, McFeMn, LcFeMn, Fe Niobium, Cored Wire, FeSiZr M/s Oswal Smelters (P) Ltd.*

7	Salary of EMP staff	6.0	-
8	Safety management.	2.5	0.25
9	Laboratory and chemicals	4.0	0.3
	<b>Total</b>	<b>35.75</b>	<b>4.0</b>

Details of budget for CSR activity are given in **Table 11**.

**Table 11: Cost of CSR Activity**

<b>Activity</b>	<b>Total Cost (lakhs)</b>
Health Camps	20.0
Vocational Skill Development Program	20.0
Entrepreneurship awareness camps	10.0
Setting up a Library and Career Counseling Center	10.0
Maintenance of roads	20.0
Drinking Water facility	20.0
<b>Total</b>	<b>100.0</b>

## 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.

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