# SUMMARY ON

# ENVIRONMENTAL IMPACT ASSESSMENT

# REPORT

**OF**

# Bhagyalaxmi Metals Pvt. Ltd.

[Establishment of Greenfield Project comprising of establishment of DRI Kilns (Sponge iron – 7,00,000 TPA), Induction Furnace with LRF & CCM (Hot Billets / MS Billets / MS Slab – 6,72,000 TPA), Rolling Mill (TMT Bars, Structural Steel - Angles, Channels, Gutters, Coils, Flat Bars, Strips, MS Pipes, MS Tubes, Galvanized Pipes and angles (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO/Producer Gas as fuel – 7,00,000 TPA), Coal Gasifier for Rolling Mill (6,300 Nm3/ hr), Ferro Alloys – 3 x 9 MVA (FeSi – 21,000 TPA / FeMn-75,600 TPA / SiMn-43,200 TPA / FeCr-45,000 TPA / Pig Iron – 75,600 TPA), WHRB based Power Plant – 60 MW, FBC based Power Plant - 20MW, Galvanizing Plant (1,00,000 TPA), Brick Manufacturing unit (70,000 Bricks/day) & Briquetting Plant (Briquettes – 300 Kg/Hr.)]

at

Plot No: B-1, Mul Growth Center Mul Village & Tehsil,
Chandrapur District, Maharashtra

**Submitted to**

**MAHARASHTRA POLLUTION CONTROL BOARD**

## 1.0 PROJECT DESCRIPTION

Bhagyalaxmi Metals Pvt Ltd. is proposing to establish a Greenfield Project comprising of establishment of DRI Kilns (Sponge iron – 7,00,000 TPA), Induction Furnace with LRF & CCM (Hot Billets / MS Billets / MS Slab – 6,72,000 TPA), Rolling Mill (TMT Bars, Structural Steel - Angles, Channels, Gutters, Coils, Flat Bars, Strips, MS Pipes, MS Tubes, Galvanized Pipes and angles (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO/Producer Gas as fuel – 7,00,000 TPA), Coal Gasifier for Rolling Mill (6,300 Nm3/ hr), Ferro Alloys – 3 x 9 MVA (FeSi – 21,000 TPA / FeMn-75,600 TPA / SiMn-43,200 TPA / FeCr-45,000 TPA / Pig Iron – 75,600 TPA), WHRB based Power Plant – 60 MW, FBC based Power Plant - 20MW, Galvanizing Plant (1,00,000 TPA), Brick Manufacturing unit (70,000 Bricks/day) & Briquetting Plant (Briquettes – 300 Kg/Hr.) at Plot No. B-1, Mul Growth Center, Mul Village & Taluka, Chandrapur District, Maharashtra.

Total land identified for the proposed project is 29.44 Ha. (72.74 Acres) of land and has been allotted by Maharashtra Industrial Development Corporation (MIDC) vide no. MIDC/RON/Mul/B-1/4333/2010 dt. 13.09.2010 and subsequently the same land has been reallotted vide letter No. MIDC/RO(NAGPUR)/Mul/LMS-72/1691/2022 dt. 09/05/2022

As per the Ministry of Environment, Forests & Climate Change, New Delhi notification, dated 14th September, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified under Category 'A'. The Ministry of Environment, Forests & Climate Change, New Delhi has accorded Terms of Reference (TOR) for the proposed project vide letter no. **J-11011/347/2022-IA-II(IND-I),** dated **20th February 2023**. The EIA Report has been prepared by incorporating the TOR stipulated by the Hon'ble EAC.

*Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad*, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1922/ SA 0148 (Rev.01), for preparing EIA report for Metallurgical Unit, have prepared Environmental Impact Assessment (EIA) report for the proposed project by incorporating the TOR approved by Ministry of Environment, Forests & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed project along with the noise level assessment.
- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed project, solid waste management, Greenbelt development.
- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

## 1.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PLANT SITE

The following is the environmental setting within the 10 Km. radius of the Project site:

**Table No. 1.1: Environment Setting within 10 Kms. radius of the site**

| S.No. | Salient Features / Environmental features | Distance w.r.t. site / Remarks |
|---|---|---|
| 1. | Type of Land | Industrial Land |
| 2. | Type of Land (Study Area) | As per LULC the land use within 10 Km. is as follows:<br>Settlements – 4.2 %; Industrial area – 1.9 %; Tanks / River / Major Canal – 10.6 %; Scrub Forest – 12.1 %; Single crop – 46.3 %; Plantation – 6.7 %; Land with scrub – 11.2 %; Land without scrub – 2.1 %; Mining area – 2.4 %; Sheet rock area – 2.5 %. |
| 3. | National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds | • There are no notified National Park / Wild life sanctuary / Biosphere reserve / Elephant corridor within 10 Km. radius of the project site.<br>• Tadoba –Andhari Tiger reserve boundary starting point is at a distance of 17.18 kms. and beyond from the project site and whereas ESZ is at distance of 5.0 Kms. from the project site.<br>• Letter is issued by Divisional Forest Officer, Chandrapur Forest Division, Chandrapur, Forest Department, Govt. of Maharashtra vide no. Desk-14/Survey/Land/1863 30.12.2022 confirming that the |

| S.No. | Salient Features / Environmental features | Distance w.r.t. site / Remarks |
|---|---|---|
| | | i. Tadoba – Andhari Tiger reserve boundary starting point is at a distance of 17.18 Kms. & beyond from the project site<br>ii. ESZ is at distance of 5.0 Kms. from the project site<br>• GO issued by MoEF&CC vide dt. 11.09.2019 notifying Tadoba –Andhari Tiger Reserve.<br>• Conservation plan is prepared |
| 4. | Historical places / Places of Tourist importance / Archeological sites | Nil |
| 5. | Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010 | None<br>And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10th July 2019. |
| 6. | Defence Installations | Nil |
| 7. | Nearest village | Maregaon Village – 0.8 Kms. (WSW) |
| 8. | No. of Villages in the Study Area | 32 nos. |
| 9. | Nearest Hospital | Primary Health Centre, Maroda – 6.7km/WNW<br>Sub District Hospital, Mul – 6.1 km/SW<br>Rural Hospital, Saoli – 7.5 km/E |
| 10. | Nearest School | Swami Vivekanand High School- 3.9 km/SW<br>Mount English Public School, Mul – 5.0 km/SW<br>Z. P. School Saoli – 6.5 km/SE<br>Z.P. School khedi – 4.6 km/SE<br>Anganwadi Khedi – 4.6<br>Industrial Training Institute Mul – 1.4 km/S<br>New college of Agriculture mul – 3.8 km/SW<br>Shinde ITI Mul – 3.7 km /SW<br>St.Annes Public School CBSE – 5.4 km/SW |
| 11. | Forests | Scrub Forest (Zudpi Jungle) exists adjacent to the project site (South direction)<br>Rajoli RF – Adjacent to the project site (NEE)<br>Mul RF - 6.6 kms (SSW) |
| 12. | Water body | Mul river – 3.9 kms (S)<br>Human Nadi – 2.5 kms (E)<br>Saloli nadi – 2.7 kms ( SSE)<br>Mul Lake – 4.5 km/SW |
| 13. | Nearest Highway | Maharashtra State Highway # 9 (Nagpur to Chandrapur Road) – 1.4 Kms by Road<br>NH # 930 - 1.4 Kms. by Road |
| 14. | Nearest Railway Station | Mul-Maroda RS - 8.0 Kms by Road |
| 15. | Nearest Port facility | Nil within 10 Km. Radius. |
| 16. | Nearest Airport | Nil within 10 Kms. Radius<br>[Nagpur Airport - 135.0 Kms. (Aerial)] |

| S.No. | Salient Features / Environmental features | Distance w.r.t. site / Remarks |
|---|---|---|
| 17. | Nearest Interstate Boundary | Nil |
| 18. | Seismic zone as per IS-1893 | Seismic zone – II,<br>MSL of the Project area – 197 m to 203 m |
| 19. | R & R | There is no rehabilitation and resettlement issue, as there are no habitations present in the site area. |
| 20. | Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project | Nil |

## 1.2 PLANT CONFIGURATION AND PRODUCTION CAPACITY

Following is the proposed plant configuration and proposed production capacities:

**Table No.1.2: Proposed Plant Configuration & Production Capacities**

| S.No. | Unit (Product) | | Configuration | Capacity |
|---|---|---|---|---|
| 1. | DRI Kilns (Sponge Iron) | | 4 x 500 TPD | 7,00,000 TPA |
| 2. | Induction Furnaces<br>(Hot Billets / MS Billets / MS Slab) | | 4 x 40 T | 6,72,000 TPA |
| 3. | Rolling Mills<br>(TMT Bars, Structural Steel - Angle, Channels, Gutters, Coils, Flat Bars, Strips, MS Pipes, MS Tubes, Galvanized Pipes and angles)<br>(85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO / Producer Gas as fuel) | | 1 x 1300 TPD<br>&<br>1 x 700 TPD | 7,00,000 TPA |
| 4. | Coal Gasifier for Rolling Mill | | 6,300 $NM^3$/ Hr | 6,300 $NM^3$/ Hr |
| 5. | Submerged Electric Arc Furnaces – Ferro Alloys<br>(FeSi / FeMn / SiMn / FeCr/Pig Iron) | | 3 x 9 MVA | FeSi – 21,000 TPA / FeMn-75,600 TPA / SiMn-43,200 TPA / FeCr-45,000 TPA/ Pig Iron - 75,600 TPA |
| 6. | Power plant (80 MW) | WHRB Based Power Plant | 4 x 15 MW | 60 MW |
| | | FBC Based Power Plant | 1 x 20 MW | 20 MW |
| 7. | Galvanizing Unit | | --- | 1,00,000 TPA |
| 8. | Bricks manufacturing Unit | | 70,000 Bricks /Day | 70,000 Bricks /Day |
| 9. | Briquetting plant | | 300 Kg/Hr. | 300 Kg/Hr. |

## 1.3 RAW MATERIAL REQUIRMENT

The following will be the raw material requirement for the proposed project:

**Table No.1.3: Raw Material Requirement, Source & Mode of Transport**

| S.No. | Raw Material | | Quantity (TPA) | Sources | Distance from site (in Kms.) | Mode of Transport |
|---|---|---|---|---|---|---|
| 1. | **For DRI Kilns (Sponge Iron) – 7,00,000 TPA** | | | | | |
| a) | Pellets (100 %) | | 10,15,000 | Maharashtra / Chhattisgarh | ~ 500 Kms. | Through covered conveyers |
| | **or** | | | | | |
| | Iron ore (100%) | | 11,20,000 | Maharashtra / Chhattisgarh | ~ 500 Kms. | By rail & road (through covered trucks) |
| b) | Coal | Indian | 9,10,000 | Maharashtra | ~ 500 Kms. | By rail & road (through covered trucks) |
| | | (or) | | | | |
| | | Imported | 5,82,400 | Indonesia / South Africa / Australia | ~ 600 Kms. (from Vizag Port) | Through sea route, rail route & by road (through covered trucks) |
| c) | Dolomite | | 35,000 | Maharashtra | ~ 100 Kms. | By road (through covered trucks) |
| 2. | **For Steel Melting Shop (Hot Billets / MS Billets / MS Slabs) – 6,72,000 TPA** | | | | | |
| a) | Sponge Iron | | 6,79,000 | Inhouse Generation | --- | Through covered conveyers |
| b) | MS Scrap / Pig Iron | | 1,01,000 | Maharashtra | ~ 100 Kms. | By road (through covered trucks) |
| c) | Ferro alloys | | 34,000 | Inhouse Generation | --- | By road (through covered trucks) |
| 3. | **For Rolling Mill through Hot charging (Rolled Products) – 7,00,000 TPA** | | | | | |
| a) | Hot Billets (for Hot charing) | | 5,95,000 | Inhouse Generation | --- | --- |
| b) | Billets (for Reheating furnace) | | 1,05,000 | Inhouse Generation | --- | --- |
| c) | LDO | | 3400 KL/annum | Nearby IOCL Depot | ~ 100 Kms. | By road (through Tankers) |
| d) | Coal for gasifier (Producer Gas) 6,300 $Nm^3/Hr$ | Indian | 18,900 | Maharashtra | ~ 500 Kms. | By rail & road (through covered trucks) |
| | | Imported | 12,096 | Indonesia / South Africa / Australia | ~ 600 Kms. (from Vizag Port) | Through sea route, rail route & by road |

| S.No. | Raw Material | | Quantity (TPA) | Sources | Distance from site (in Kms.) | Mode of Transport |
|---|---|---|---|---|---|---|
| 4. | **For FBC Boiler [Power Generation 20 MW]** | | | | | |
| a) | Indian Coal | | 1,18,800 | Maharashtra | ~ 500 Kms. | By rail & road (through covered trucks) |
| | **OR** | | | | | |
| b) | Imported Coal | | 76,000 | Indonesia / South Africa / Australia | ~ 600 Kms. (from Vizag Port) | Through sea route, rail route & by road (through covered trucks) |
| | **OR** | | | | | |
| c) | Dolochar + Indian Coal | Dolochar | 1,40,000 | Inhouse Generation | --- | through covered conveyors |
| | | Indian Coal | 48,800 | Maharashtra | ~ 500 Kms. | By rail & road (through covered trucks) |
| | **OR** | | | | | |
| d) | Dolochar + Imported Coal | Dolochar | 1,40,000 | Inhouse Generation | --- | through covered conveyors |
| | | Imported Coal | 31,232 | Indonesia / South Africa / Australia | ~ 600 Kms. (from Vizag Port) | Through sea route, rail route & by road (through covered trucks) |
| 5. | **For Ferro Alloys (3 x 9 MVA)** | | | | | |
| 5 (i) | *For Ferro Silicon – 21000 TPA* | | | | | |
| a) | Quartz | | 31,920 | Maharashtra / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| b) | LAM coke | | 11,760 | Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| c) | Mill scales/ MS Scrap | | 5,670 | Inhouse Generation | --- | By road (through covered trucks) |
| d) | Electrode paste | | 420 | Maharashtra / West Bengal | ~ 300 Kms. | By road (through covered trucks) |
| e) | Bagfilter dust | | 798 | Inhouse Generation | --- | --- |
| 5 (ii) | *For Ferro Manganese – 75,600 TPA* | | | | | |
| a) | Manganese Ore | | 1,71,990 | MOIL / OMC | ~ 500 Kms. | By Rail & Road (through covered trucks) |

| S.No. | Raw Material | Quantity (TPA) | Sources | Distance from site (in Kms.) | Mode of Transport |
|---|---|---|---|---|---|
| b) | LAM coke | 27,594 | Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| c) | Dolomite | 12,852 | Maharashtra / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| d) | MS Scrap / Mill scales | 11,340 | Inhouse Generation | --- | By road (through covered trucks) |
| e) | Electrode Paste | 983 | Maharashtra / West Bengal | ~ 300 Kms. | By road (through covered trucks) |
| f) | Bagfilter dust | 3,780 | In house generation | --- | --- |
| 5 (iii) | *For Silico Manganese – 43,200 TPA* | | | | |
| a) | Manganese Ore | 70,416 | MOIL / OMC | ~ 500 Kms. | By Rail & Road (through covered trucks) |
| b) | FeMn Slag | 45,708 | In house generation | --- | ---- |
| c) | LAM Coke | 16,200 | Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| d) | Dolomite | 9,720 | Maharashtra / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| e) | Electrode paste | 864 | Maharashtra / West Bengal | ~ 300 Kms. | By road (through covered trucks) |
| f) | Quartz | 10,368 | Maharashtra / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| g) | Bag filter dust | 648 | In house generation | --- | --- |
| 5 (iv) | *For Ferro Chrome – 45,000 TPA* | | | | |
| a) | Chrome Ore | 90,000 | Sukinda, Odisha<br><br>Import, South Africa | ~ 500 Kms.<br><br>~ 600 Kms. (from Vizag Port) | By road (through covered trucks)<br>From Port By Road (through covered Trucks) |
| b) | LAM Coke | 14,850 | Andhra Pradesh | ~ 500 Kms. | By road |

| S.No. | Raw Material | Quantity (TPA) | Sources | Distance from site (in Kms.) | Mode of Transport |
|---|---|---|---|---|---|
| | | | | | (through covered trucks) |
| c) | Quartz | 7,875 | Maharashtra / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| d) | MS Scrap / Mill Scale | 6,750 | Inhouse Generation | --- | By road (through covered trucks) |
| e) | Magnetite / Bauxite | 7,605 | Maharashtra / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| f) | Electrode Paste | 1,350 | Maharashtra / West Bengal | ~ 300 Kms. | By road (through covered trucks) |
| g) | Bagfilter dust | 2,880 | Own generation | --- | --- |
| 5 (v) | *For Pig Iron – 75,600 TPA* | | | | |
| a) | HG Iron ore | 111,510 | Maharashtra / Chhattisgarh | ~ 500 Kms. | By rail & road (through covered trucks) |
| b) | LAM Coke | 36,666 | Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| c) | Lime stone | 9,450 | Maharashtra / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| d) | Quartz | 4,536 | Maharashtra / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| e) | Electrode Paste | 1,512 | Maharashtra / West Bengal | ~ 300 Kms. | By road (through covered trucks) |
| f) | Briquetted Bag filter dust | 2,268 | Own generation | --- | --- |
| 6 | **Galvanizing Plant (1,00,000 TPA)** | | | | |
| a) | Tube, Wires, Pipes etc. | 1,00,000 | Own generation | --- | --- |
| b) | Zinc | 4,200 | Maharashtra | ~ 200 Kms. | By road (through trucks) |
| c) | HCl | 302,400 Kl/annum | Maharashtra | ~ 200 Kms. | By road (through trucks) |
| d) | Ammonium Zinc Chloride | 300 | Maharashtra | ~ 200 Kms. | By road (through trucks) |
| e) | Sodium Dichromate | 1,680 | Maharashtra | ~ 200 Kms. | By road (through trucks) |

## 1.4 MANUFACTURING PROCESS

### 1.4.1 Sponge Iron (DRI)

The proposal consists of 4 x 500 TPD to manufacture 7,00,000 TPA of Sponge Iron with 60.0 MW WHRB facility. Refractory lined rotary kilns will be used for reduction of iron ore in solid state.

Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about $1000^0$C enters the reduction zone. Temperature of the order of $1050^0$C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to $160^0$C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

### 1.4.2 Steel Melting Shop

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of

Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 4 x 40 Induction furnaces to manufacture Hot Billets / MS Billets / MS Slab of 6,72,000 TPA. Either the Hot Billets produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through Hot charging method (or) Billets / Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture TMT Bars, Structural Steel - Angle, Channels, Gutters, Coils, Flat Bars, Strips, MS Pipes, MS Tubes, Galvanized Pipes and angles. The flue gases will be treated in fume extraction system with bagfilters.

### 1.4.3 Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) Hot Billets will be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Rolling Mill. Furnace will be heated with either LDO / Producer Gas. A Rolling mills (1 x 1330 TPD & 1 x 700 TPD) will be installed in the present proposal to produce 7,00,000 TPA of TMT Bars, Structural Steel - Angle, Channels, Gutters, Coils, Flat Bars, Strips, MS Pipes, MS Tubes, Galvanized Pipes and angles.

### 1.4.4 Submerged Electric Arc Furnace

Submerged Electric Arc Furnace (3 x 9 MVA) will be setup in the proposed project. Ferro Manganese, Silicon Manganese will be produced using manganese ore as main raw material, Ferro Silicon will be produced using Quartz as main raw material & Ferro Chrome will be produced using Chrome Ore as main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage. Flue gases will be extracted through 4$^{th}$ hole and then treated in bag filters.

### 1.4.5 Power Generation

**Through WHRB Boiler**

The hot flue gases from proposed 4 x 500 TPD DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate (4 x 15 MW) electricity. The gases after heat recovery will pass through ESP and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere through stacks of adequate height.

**Through FBC Boiler**

Coal (Imported / Indian) along with dolochar will be used as fuel in FBC Boilers to generate 20 MW of electricity. The flue-gases will be treated in high efficiency ESP and then discharged through a stack of adequate height into the atmosphere.

### 1.4.6 Galvanisation Plant

The process involves immersing steel or iron in a bath of molten zinc in order to produce a corrosion resistant, coating of iron and zinc alloy and zinc metal. When the steel remains immersed in the zinc, a metallurgical reaction takes place between iron that is present in the steel and the molten zinc. As this reaction is a diffusion process the coating is formed perpendicular to all surfaces so a uniform thickness is formed throughout the part.

### 1.4.7 Fly Ash Brick Manufacturing Unit

It is proposed to establish Fly Ash brick making unit of 70,000 bricks/day capacity. Fly ash (70%), Gypsum (5%), cement (10%) and Stone dust (15%) are manually feed into a pan mixer where water is added to the required proportion for homogeneous mixing. The proportion of raw material may vary depending upon quality of raw materials

## 1.5 Water Requirement

- Water required for the proposed project will be 2800 KLD. This includes make up water for DRI Kiln, Induction Furnace, Rolling Mill, Coal Gasifier, Ferro Alloys, Galvanizing Unit, Brick Manufacturing unit, Briquetting Unit & Domestic.
- Air cooled condensers will be provided Power plant.
- Water required for proposed project (for process and domestic) is 2800 KLD & Water required for proposed project will be supplied by Maharashtra Industrial Development Corporation (MIDC). In case of any shortfall from MIDC, it is proposed to source remaining quantity of water through Borewells in the company owned private land of 10 acres, proximate to the proposed project site (which not part of the MIDC land). A pipeline will be laid to bring water to the proposed project site.

**Table No.1.4: Water Requirement Breakup**

| S.No. | Unit | Quantity in KLD |
|---|---|---|
| 1. | Make-up water for DRI plant | 500 |

| | | |
|---|---|---|
| 2. | Make-up water for SMS plant | 400 |
| 3. | Make-up water for Rolling mill | 450 |
| 4. | Make-up water for Ferro Alloy plant | 90 |
| 5. | Make-up water for Coal Gasifier | 10 |
| 6. | Make-up water for Galvanisation Plant | 10 |
| 7. | Bricks manufacturing Unit | 10 |
| 8. | Briquetting plant | 10 |
| 9. | Captive Power Plant | 1300 |
| | • Cooling Tower Make-up | 545 |
| | • Boiler make-up | 605 |
| | • D.M. plant regeneration water | 150 |
| 10. | Domestic | 20 |
| | **Total** | **2800** |

### 1.6 Wastewater Generation

- Total effluent generated from the proposed project will be 442 KLD.
- There will be no effluent discharge in the Sponge Iron, unit as closed-circuit cooling system will be adopted.
- Effluent generated from Induction Furnace Unit, Ferro Alloys, Galvanisation Plant will be sent to Effluent Treatment Plant (ETP) for treatment and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent from power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent generated from Coal Gasifier will be used in ABC Chamber of DRI Kilns.
- Air cooled condenser will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will be also be minimized.
- Sanitary waste water will be treated in STP and after treatment it will be utilized for greenbelt development.
- Zero liquid effluent discharge practice will be maintained in the proposed project.
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.

**Table No.1.5: Breakup of Wastewater Generation**

| S.No. | Source | Generation (KLD) |
|---|---|---|
| 1. | From Induction Furnace | 20 |
| 2. | From Rolling Mill | 22 |
| 3. | From Ferro Alloys | 6 |
| 4. | From Coal Gasifier | 8 |
| 5. | From Galvanisation Plant | 5 |
| 6. | Power Plant | 365 |
| | a) Cooling Tower blowdown | 125 |
| | b) Boilers blowdown | 90 |
| | c) D.M. plant regeneration water | 150 |
| 7. | Sanitary Wastewater | 16 |
| | **Total** | **442** |

## 1.7 Wastewater Characteristics

The following are the Characteristics of wastewater.

**Table No.1.6: Characteristics of Effluent**

| PARAMETER | CONCENTRATION | | | |
|---|---|---|---|---|
| | Cooling Tower blowdown | DM Plant Regeneration | Boiler Blowdown | Sanitary waste water |
| pH | 7.0 – 8.0 | 5.0 – 10.0 | 9.5 – 10.5 | 7.0 – 8.5 |
| BOD (mg/l) | -- | -- | -- | 200 – 250 |
| COD (mg/l) | -- | -- | -- | 300 – 400 |
| TDS (mg/l) | 1000 | 5000 – 6000 | 1000 mg/l | 800 – 900 |
| Oil & Grease (mg/l) | -- | 10 | -- | 5 - 10 |
| TSS (mg/l) | -- | -- | -- | 150-200 |

## 2.0 DESCRIPTION OF ENVIRONMENT

Base line data has been collected on ambient air quality, water quality, noise levels, flora and fauna and socio-economic details of people within 10 km radius of the plant.

## 2.1 Ambient air quality

Ambient air quality was monitored for $PM_{2.5}$, $PM_{10}$, $SO_2$, NOx & CO at 8 stations including project site during **1st March 2022 to 31stMay 2022**. The following are the concentrations of various parameters at the monitoring stations:

**Table No.2.1 : AAQ Data Summary**

| S.No. | Parameter | Concentration range | Standard as per NAAQS |
|---|---|---|---|
| 1. | $PM_{2.5}$ | 26.7 to 41.8 µg/m$^3$ | 60 |
| 2. | $PM_{10}$ | 44.5 to 69.3 µg/m$^3$ | 100 |

| | | | |
|---|---|---|---|
| 3. | $SO_2$ | 7.9 to 16.7 µg/m$^3$ | 80 |
| 4. | $NO_X$ | 8.7 to 19.8 µg/m$^3$ | 80 |
| 5. | CO | 355 to 1050 µg/m$^3$ | 2000 |

## 2.2 Water Quality

### 2.2.1 Surface Water Quality

5 no. of samples i.e. 60m Upstream & 60 m Downstream from Human Nadi (2.5 Kms. – East Direction), 60m Upstream & 60 m Downstream from Saloli Nadi (2.7 Kms. – SEE Direction) and Maregaon Village Pond have been collected and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

### 2.2.2 Ground Water Quality

8 No. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

## 2.3 Noise Levels

Noise levels were measured at 8 locations during daytime & Nighttime. The equivalent day-night noise levels in the study zone are ranging from **46.5 dBA to 63.5 dBA.**

# 3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

## 3.1 Prediction of impacts on air quality

The likely emissions from the proposed project are $PM_{10}$, $SO_2$, NOx & CO. The predictions of Ground level concentrations have been carried out using Industrial Source Complex (ISC-3) model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

**Table No.2.2: NET RESULTANT MAXIMUM CONCENTRATIONS DURING THE OPERATION OF THE PROPOSEDPROJECT (APCS WORKING SCENARIO)**

| Item | $PM_{10}$ ($\mu g/m^3$) | $SO_2$ ($\mu g/m^3$) | $NO_X$ ($\mu g/m^3$) | CO ($\mu g/m^3$) |
|---|---|---|---|---|
| Maximum baseline conc. in the study area | 69.3 | 16.7 | 19.8 | 1050 |
| Maximum predicted incremental rise in concentration due to proposed project (Point Sources) | 1.7 | 11.8 | 11.1 | --- |
| Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions) | 0.7 | --- | 5.4 | 3.5 |
| **Net resultant concentrations during operation of the proposed project** | 71.7 | 28.5 | 36.3 | 1,053.5 |
| **National Ambient Air Quality Standards** | **100** | **80** | **80** | **2000** |

The net resultant Ground level concentrations during operation of the proposed project are within the NAAQS. Hence, there will not be any adverse impact on air environment due to the proposed project.

### 3.2 Prediction of impacts on Noise quality

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosures will be provided to the STG. The ambient noise levels will be within the standards prescribed by MoEF vide notification dated 14-02-2000 under the Noise Pollution (Regulation & Control), Rules 2000 i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. **10.11 Ha.** of extensive greenbelt will be developed to further attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed project.

### 3.3 Prediction of impacts on Water Environment

- There will be no effluent discharge in the Sponge Iron, unit as closed-circuit cooling system will be adopted.
- Effluent generated from Induction Furnace Unit, Ferro Alloys, Galvanisation Plant will be sent to Effluent Treatment Plant (ETP) for treatment and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.

- Effluent from power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent generated from Coal Gasifier will be used in ABC Chamber of DRI Kilns.
- Air cooled condenser will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will be also be minimized.
- Sanitary waste water will be treated in STP and after treatment it will be utilized for greenbelt development.
- Zero liquid effluent discharge practice will be maintained in the proposed project.
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.

### 3.4 Prediction of Impacts on Land Environment

The effluent will be treated to achieve SPCB standards. Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed / utilized as per CPCB / SPCB norms **10.11 Ha.** of extensive greenbelt will be developed as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed project.

### 3.5 Socio - Economic Environment

There will be certain upliftment in Socio Economic status of the people in the area & development of the area due to the proposed project. Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

## 4.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF&CC are tabulated below:

**TABLE NO.4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS**

| S.No. | Particulars | Frequency of Monitoring | Duration of sampling | Parameters required to be monitored |
|---|---|---|---|---|
| **1. Water & Wastewater quality** | | | | |

| S.No. | Particulars | Frequency of Monitoring | Duration of sampling | Parameters required to be monitored |
|---|---|---|---|---|
| A. | Water quality in the area | Once in a month except for heavy metals which will be monitored on quarterly basis | Grab sampling | As per IS: 10500 |
| B. | Effluent at the outlet of the ETP | Twice in a month | Composite sampling | As per EPA Rules, 1996 |
| C. | STP Inlet & Outlet | Twice in a month | Composite sampling | As per EPA Rules1996 |
| **2. Air Quality** | | | | |
| A. | Stack Monitoring | Online monitors (all stacks)<br>Once in a month | | PM<br>PM, $SO_2$ & NOx |
| B. | Ambient Air quality (CAAQMS) | Continuous<br>Quarterly Once | Continuous<br>24 hours | $PM_{10}$, $SO_2$& NOx<br>$PM_{2.5}$, $PM_{10}$, $SO_2$, NOx & CO |
| C. | Fugitive emissions | Quarterly Once | 8 hours | PM |
| **3. Meteorological Data** | | | | |
| | Meteorological data to be monitored at the plant. | Daily | Continuous monitoring | Temperature, Relative Humidity, rainfall, wind direction & wind speed. |
| **4. Noise level monitoring** | | | | |
| | Ambient Noise levels | Quarterly Once | Continuous for 24 hours with 1 hour interval | Noise levels |

## 5.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved in the proposed project as there are no habitations in the project site. Hence no R & R study has been carried out.

## 6.0 PROJECT BENEFITS

With the establishment of the proposed project employment potential will increase. Land prices in the area will increase. The economic status of the people in the area will improve due to the proposed project. Periodic medical checkups will be carried out. Top priority will be given to locals in employment.

## 7.0 ENVIRONMENT MANAGEMENT PLAN

### 7.1 Air Environment

The following are air emission control systems proposed in the proposed project:

**Table No.11.7.1: Air Emission Control Systems Proposed**

| S.No. | Source | Control Equipment | Emission at the outlet |
|---|---|---|---|
| 1. | DRI kilns with WHRB's | Electro Static Precipitators (ESP) (High Performance rigid electrodes) | PM < 30 mg/Nm$^3$ |
| 2. | Induction Furnaces with CCM | Fume Extraction system with PTFE bag filters | PM < 30 mg/Nm$^3$ |
| 3. | Submerged Electric Arc Furnace | 4$^{th}$ Hole Fume Extraction system with bag filters | PM < 30 mg/Nm$^3$ |
| 4. | Re-heating furnaces attached to Rolling Mill | Stack | PM < 30 mg/Nm$^3$ |
| 5. | FBC Boiler | Electro Static Precipitators (High Performance rigid electrodes) | PM < 30 mg/Nm$^3$ |
| | | Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done | SOx< 100 mg/Nm$^3$ |
| | | Combustion temperature will be around 800-850$^0$C, which is not conducive for thermal NOx formation. Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided. | NOx < 100 mg/Nm$^3$ |
| **Note** : Apart from the above Dry fog system with dust suppression at transfer points, crushing plant , dust extraction system with bagfilters at other dust emanating areas , covered conveyers, mechanical dust sweepers, etc. will also be provided. | | | |

Apart from the above the following air emission control systems/ measures are proposed in the Plant:

- All conveyors will be completely covered with G.I. sheets to control fugitive dust.
- All bins will be totally packed and covered so that there will not be any chance for dust leakage.
- All the dust prone points material handling systems will be connected with de-dusting system with bag filters.
- All discharge points and feed points, wherever the possibility of dust generation is there a de-dusting suction point will be provided to collect the dust.

### 7.2 Water Environment

- Total effluent generated from the proposed project will be 442 KLD.
- There will be no effluent discharge in the Sponge Iron, unit as closed-circuit cooling system will be adopted.
- Effluent generated from Induction Furnace Unit, Ferro Alloys, Galvanisation Plant will be sent to Effluent Treatment Plant (ETP) for treatment and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent from power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent generated from Coal Gasifier will be used in ABC Chamber of DRI Kilns.
- Air cooled condenser will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will be also be minimized.
- Sanitary waste water will be treated in STP and after treatment it will be utilized for greenbelt development.
- Zero liquid effluent discharge practice will be maintained in the proposed project.
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.

**EFFLUENT TREATMENT PLANT**

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed with Cooling Tower blowdown in a Central Monitoring Basin (CMB). Service water will be treated in an oil separator and after treatment it will be taken to CMB. The treated effluent will be utilized for dust suppression, ash conditioning and for Greenbelt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented.

The following will be treated combined effluent characteristics.

- pH - 6.5 - 8.5
- TSS - < 100 mg/l

- Oil & Grease - < 10 mg/l
- Free available chlorine - < 1.0 mg/l
- Copper - <1.0 mg/l
- Iron - < 1.0 mg/l
- Zinc - < 1.0 mg/l
- Chromium - < 0.2 mg/l
- Phosphates - < 5.0 mg/l

*Treated Sewage Characteristics*

| S.No. | Parameters | Parameters limit |
|---|---|---|
| 1. | pH | 6.5 – 8.0 |
| 2. | BOD (mg/ L) | Not more than 10 |
| 3. | COD (mg/ L) | Not more than 50 |
| 4. | TSS (mg/ L) | Not more than 20 |
| 5. | $NH_4$-N (mg/ L) | Not more than 5 |
| 6. | N-Total (mg/ L) | Not more than 10 |
| 7. | Fecal Coliform (MPN/100 ml) | Less than 100 |

**TREATED EFFLUENT DISPOSAL**

| | |
|---|---|
| Total treated effluent generation | 442 KLD |
| Effluent quantity to be used for ash conditioning | 42 KLD |
| Effluent to be used for dust suppression in CHP | 60 KLD |
| Effluent to be used for Greenbelt development | 250 KLD |
| Effluent from Gasifier to be used in ABC Chamber | 8 KLD |
| RO Rejects to be used for Floor washing, Toiler cleaning & Flushing | 82 KLD |

**10.11 Ha.** of greenbelt will be developed within the plant premises by using the treated effluent. A dedicated pipe distribution network will be provided for using the treated effluent for greenbelt development.

## 7.3 Noise Environment

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosure will be provided. All the machinery will be manufactured in accordance with MoEF&CC norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. The extensive greenbelt development proposed within the plant premises will help in attenuating the noise levels further. Noise barriers in the form of trees are recommended to be grown around administrative block and other utility units.

### 7.4 Land Environment

The wastewater generated from the proposed project will be treated in the Effluent Treatment Plant to comply with the SPCB standards and will be used for dust suppression, ash conditioning and for greenbelt development. All the required Air emission control systems will be installed and operated to comply with SPCB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposed project.

**Table No.7.2: Solid Waste Generation and Disposal**

| S.No. | Waste | Quantity (TPA) | Proposed method of disposal |
|---|---|---|---|
| 1. | Ash from DRI | 1,26,000 | Will be utilized in the proposed Brick Manufacturing Unit |
| 2. | Dolochar | 1,40,000 | Will be used in proposes CFBC power plant as fuel. |
| 3. | Kiln Accretion Slag | 6,300 | Will be utilized in the proposed Brick Manufacturing Unit |
| 4. | Wet scrapper sludge | 28,000 | Will be utilized in the proposed Brick Manufacturing Unit |
| 5. | SMS Slag | 67,200 | Slag from SMS will be crushed and iron will be recovered & then remaining non -magnetic material being inert by nature will be used in proposed Brick Manufacturing Unit |
| 6. | End Cuttings from Rolling Mill | 20,730 | Will be reused in the SMS |
| 7. | Mill scales from Rolling Mill | 2,100 | Mill scales will be recycled to Ferro alloys unit. |
| 8. | Ash from Power Plant (Indian Coal + Dolochar) | 1,05,960 | Will be utilized in the proposed Brick Manufacturing Unit |
| 9. | Slag from FeMn | 45,708 | Will be reused in manufacture of SiMn as it contains high $SiO_2$ and Silicon. |
| | **(or)** | | |
| 10. | Slag from FeSi | 5,057 | Will be given to Cast iron foundries |
| | **(or)** | | |
| 11. | Slag from SiMn | 38,481 | will be used for Road construction / will be given to slag cement manufacturing |
| | **(or)** | | |
| 12. | Slag from FeCr | 26,136 | Will be processed in Zigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analysed for Chrome content through TCLP test, if the Chrome content in the slag is within the |

| S.No. | Waste | Quantity (TPA) | Proposed method of disposal |
|---|---|---|---|
| | | | permissible limits, then it will be utilised for Road laying /brick manufacturing.<br>If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF. |
| | **(or)** | | |
| 13. | Slag from Pig Iron | 32,508 | Will be given slag based cement manufacturing units |
| 14. | Zinc Dross | 650 | Will be given to SPCB approved vendors / TSDF |
| 15. | ETP Sludge | 100 | Will be sent to TSDF |

### 7.5 Greenbelt Development

Greenbelt of **10.11 Ha.** of extensive greenbelt will be developed in the plant premises. Width of proposed greenbelt ranges from 20 m.

### 7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 45.84 Crores

Recurring Cost per annum for Environmental protection : Rs. 10.32 Crores

### 7.7 Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

- Continuous stack monitoring system is proposed for stack attached to all the Stacks.
- Online Ambient Air Quality Monitoring Stations will be established in consultation with SPCB during operation of the plant.
- Fugitive emission monitoring will be carried out as per CPCB norms.
- Energy meters will be installed for all the pollution control systems.
- Rain water harvesting pits are being constructed in consultation with CGWB.