PRE-FEASIBILITY REPORT

FOR
INCREASING THE PRODUCTION CAPACITY
of
EXISTING BLAST FURNACES
From
2,92,000 TPA to 3,50,000 TPA
(Increase by 58000 TPA)
BY
Process Optimization &
Efficiency Improvement

LOCATION
Village: Amona
Taluka: Bicholim
Dist: North Goa
GOA

APPLICANT
Vedanta Limited
Pig Iron Plant
(Formerly Sesa Goa Limited)
(Formerly Sesa Industries Limited)

MAY 2016


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1. **Executive Summary:**

Vedanta Limited (formerly Sesa Industries Ltd. and Sesa Goa Limited) operates two Mini Blast Furnaces (MBFs), 2 nos. X 173m3 Working Volume were installed and commissioned prior to 1994. Hence Pig Iron Plant at Amona does not have Environmental Clearance, as set up was prior to EIA Notification 1994. Provisional No Objection Certificate (NOC) was granted by Goa State Pollution Control Board (GSPCB) vide No.7/63/89-PCB/44 dated 17/04/1989 and final NOC vide No.7/63/89-PCB/878 dated 15/01/1991. GSPCB granted Consent to Operate Pig iron Plant vide No.6/19/92-PCB/617 dated 01/12/1992 under Air (Prevention & Control of Pollution) Act, 1981 and Consent to Operate vide No.5/223/91-PCB/768 dated 02/01/1992 under Water (Prevention & Control of Pollution) Act, 1974.

With in-house experiences in operating the blast furnace and experience gathered from other similar BF operating in India, it has been inferred that hot metal production can be increased by additional 58000 TPA, i.e. from 292000 TPA to 350000 TPA with the existing Blast Furnaces.

The 173 *2* m³ Blast Furnaces was designed for foundry grade production having around 2% Si, primarily catering to auto industry for different castings manufacturing. Also Ferro silicon prices got affected due to fall in steel market. To reduce cost of production many of the manufacturers have started using semi-foundry or basic grade pig iron having lesser Si% and explored addition of ferro silicon to metal after melting of pig iron in cupola or induction furnaces.

Since there was over all shortage of demand and China has started dumping steel in India which was cheaper option for different consumers in India. This resulted in pushing primary steel producers to produce pig iron as there was stiff competition in steel production cost and Indian Steel producers were not competitive against the imported steel from other countries. This resulted in heavy inventories of pig iron in India. Looking in to the scenario and taking advantage of strategic location where in sea transport is viable option, management has taken decision of exporting basic grade pig iron in big way. Although there was competition from primary steel producers, Goa being very close located to sea and good water bound logistic infrastructure in place was an advantage there by making Sesa / Vedanta compete with big steel manufacturers.

Max. around Rs. 30 to 35 Cr. will be required, especially for setting up of Oxygen Plant for increase in production capacity by 58000 TPA. Around 10-15 people will be required for operation of oxygen plant besides indirect employment.
The existing twin Blast Furnaces of 173 m³ volume each having Consent to Operate capacity 2,92,000 TPA are operating. The production capacity enhancement to 3,50,000 TPA through process optimization could be done without stopping the BF. It will be completed within 6 month of getting EC.

This production increase can be achieved through increased injection of wind volume, oxygen enriched blast, charging sinter feed upto 50%, better process control in operations, etc. without any change in Blast Furnace or change of product mix.

**Pollution load statement**

<table>
<thead>
<tr>
<th>S.no</th>
<th>Environmental Component</th>
<th>Pollution Load discharged to environment after capacity enhancement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Land Area</td>
<td>There will be no increase in land area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(no physical expansion, no change in BF layout)</td>
</tr>
<tr>
<td>2</td>
<td>Water Consumption</td>
<td>Around 200 KLD water will be required, especially for Oxygen Plant operation. Water will be used from within existing permission granted by Water Resource Department. Water will be sourced from either rain water harvested in mine pits or post monsoon rain water harvested by installing barrage by WRD.</td>
</tr>
<tr>
<td>3</td>
<td>Water Environment</td>
<td>Entire wastewater from BF complex will be recycled &amp; reused</td>
</tr>
<tr>
<td>4</td>
<td>Air Environment</td>
<td>Existing Gas Cleaning Plants (GCPs) have adequate capacity for the additional dust load.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>There will be no additional discharge into air environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Entire dust collected from GCPs will be reused in the sinter plant (100%)</td>
</tr>
<tr>
<td>5</td>
<td>Solid Wastes</td>
<td>100% BF slag (actually it is not solid waste but a raw material for cement plants) will be granulated and sold to cement plants 100% dust will be reused in the sinter plant.</td>
</tr>
</tbody>
</table>
2. **Introduction of Project / Background Information:**

(i) **Identification of Project and Project proponent.**

**Name of Project:** Production Capacity Enhancement of Existing Pig Iron plant, Blast Furnaces from 2,92,000 TPA to 3,50,000 TPA. (Increase by 58000 TPA)

**Category of Project:** “A” Category.

**Project Proponent:** Vedanta Limited - Pig Iron Plant (Formerly Sesa Industries Ltd / Sesa Goa Limited)

(ii) **Brief description of nature of the project:**

The volume of existing 2 mini blast furnaces is 173 m$^3$ each. The licenced production capacity as per consent is 2,92,000 TPA. Highest annual production achieved since inception was 2,79,550 in 2009-10. Highest daily production achieved was 949 tonnes.

**Table showing past 5 years production figures**

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual hot metal Production in tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12</td>
<td>244542</td>
</tr>
<tr>
<td>2012-13</td>
<td>222244</td>
</tr>
<tr>
<td>2013-14</td>
<td>231443</td>
</tr>
<tr>
<td>2014-15</td>
<td>227322</td>
</tr>
<tr>
<td>2015-16</td>
<td>240376</td>
</tr>
</tbody>
</table>

It has been observed from the existing BF that through appropriate process optimization the production capacity could be increased by around 20% to
3,50,000 TPA. This could be achieved by increasing the hot blast volume, by Increasing oxygen enrichment and increasing the Fe content in sinter burden. There will be no change in the process technology, general layout and marginal increase in water consumption. The plant area will remain same. Technically, the pollution load discharged into the environment will also remain same.

(iii) **Need of Project and Importance to the Country or Region:**

The existing BF produces foundry grade pig iron for automobile sector. Hot metal is tapped into ladle and poured in the Pig Casting Machine.

Productivity rate of foundry grade pig iron using BF is low as compared to productivity of basic grade pig iron using the same blast furnace. This is mainly because of strict process control requirement in making foundry grade pig iron.

Enhancing Energy Efficiency in Industries, is one of the key agenda of India’s Intended Nationally Determined Contribution during *United Nations Climate Change Conference*, at Paris, 2015.

In line with same, we are proposing to have energy efficient blower system, which will increase wind volume injection to the Blast Furnaces at the existing power consumption. Due to increase wind volume injection there will be default increase in production from Blast Furnaces.

With restart of iron ore mining in Goa, higher iron (Fe) bearing raw materials – iron ores are readily available.

Thus charging good quality iron ore will lead to increase in production but at the same time coke consumption and slag generation will come down, which is a positive impact on the environment.
(iv) Demand – Supply Gap:

Incremental maximum 58000 Tonnes/year pig iron produced will be either sold in the local market or exported through Marmugoa Port Trust.

(v) Imports Vs Indigenous production:

With Make in India concept, Goan iron ore is charged in Mini Blast Furnaces, to the tune of 85-90%. This pig iron produced is generally sold in Indian Foundry or steel market.

(vi) Export Possibility:

The project is located close to Major Port. This will enhance the export chance by remaining cost competitive.

(vii) Domestic / Export Markets:

Railway line exists till Madgaon in Goa. This will make the product competitive in domestic market like Maharashtra and Karnataka.

The plant is located close to Major Port. This will enhance the export chance by remaining cost competitive.

(viii) Employment Generation (Direct & Indirect) due to project:

It is proposed to install Oxygen Plant for enriching the blast volume. Hence 10-15 employees will be required.

Handling and transportation of additional raw materials and slag would attract additional employment, both direct as well as indirect.
3. **Project Description:**

(i) **Type of project including interlinked and interdependent projects, if any:**

This is a stand-alone pig iron plant which is operational since 1994. Oxygen Plant will be installed for oxygen enrichment of the blast.

(ii) **Location (map showing general location, specific location, and project boundary & project site layout) with coordinates:**

**General Location / Specific Location of Project Site:** Annexure 1

**Project Boundary on 10 km SOI Toposheet:** Annexure 2

**General Plant Layout:** Annexure 3

(iii) **Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental conditions gone into to be highlighted:**

This is an existing plant. Land area and general layout remains unchanged. Hence not applicable.

(iv) **Size and Magnitude of Operation:**

It is ‘A’ Category Project as per EIA Notification 2006. Additional cost of Rs 30-35 Crs is envisaged, especially for oxygen plant installation and changing the energy efficient impeller of the blowers.
(v) **Project description with process details** (a schematic diagram/flow chart showing the project layout, components of the project etc. should be given):

Attached as **Annexure 4**

(vi) **Raw Material required along with estimated quantity, likely source, marketing area of final product / s, Mode of transport of raw material and finished product:**

Attached as **Annexure 5**

(vii) **Resource Optimization / recycling and reuse envisaged in the project, if any, should be briefly outlined:**

Entire dust collected in Gas Cleaning Plant of Blast Furnaces and Scales of Cast House / PCM will be recycled in Sinter Plant.

Slag generated from BF will be granulated and 100% sold to cement making plants.

Wastewater generated from BFs will be treated and reused.

BF gas shall be partially reused in stoves for making hot blast and balance shall be used along with coke oven gas to generate power using Waste Heat Recovery Boiler based Power Plant (existing 30 MW CPP).

In this manner the existing Pig Iron Plant will technically continue to remain as zero- discharge plant.
(viii) **Availability of water it’s source, Energy / power requirement and source should be given:**

Around 200 KLD water will be required, especially for Oxygen Plant operation. Water will be used from within existing permission granted by Water Resource Department. Water will be sourced from either rain water harvested in mine pits or post monsoon rain water harvested by installing barrage by WRD.

Captive Power Plant (Waste Heat Recovery Boiler based) (2*30 MW) exists from which additional power of 1-2MW will be consumed.

(ix) **Quantity of Wastes to be generated (liquid or soild) and scheme of their management / disposal: (Total after capacity enhancement)**

Incremental slag of 9920 TPA will be 100% granulated and sold to cement makers
Incremental dust from air pollution control equipment: 870 TPA will be 100% reused in the Sinter Plant.

(x) **Schematic representations of the feasibility which give information of EIA purpose:**

Pig Iron Plant with 2 Mini Blast Furnaces (MBFs) of 173m3 volume is operational since 1994. It is proposed to have process optimization and efficiency improvement along with installation of Oxygen Plant that will increase production by 58000 Tonnes/year. There is no requirement of additional land. Around 200 KLD or water will be required, especially for operation of Oxygen Plant. Power will be met through existing captive waste heat recovery power plants. The production capacity
enhancement is about 20% of the existing. Therefore no TOR points for undertaking detailed EIA is proposed for this project.

The company is generating environmental data on regular basis; ambient air quality, wastewater quality before and after treatment, and keeping records of use of solid wastes like slag, dust, spent oil, etc.
4. **Site Analysis:**

   (i) **Connectivity:** The project is well connected by road.

   (ii) **Land Form, Land use and Land Ownership:**

   Land area: Around 44 hectares
   The existing land use is village Panchayat/Communidade land.
   Vedanta Limited owns the land or is either on lease.

   (iii) **Existing Infrastructure:**

   i. 2 nos Mini Blast Furnaces of 173m3 volume
   ii. Hot Blast Stoves and Blower Systems
   iii. Pig Casting Machines
   iv. Raw Material yards, Pig Iron yard and slag shed
   v. Other auxiliaries required for plant operations

   (iv) **Soil Classification:**

   The soil is lateritic type. The area falls under Seismic Zone III.

   (v) **Climatic Data from secondary sources:**

   Climatological Data attached as **Annexure 6.**

   (vi) **Social Infrastructure available:**

   Health center, Bust Stop, Temples, etc.
5. **Planning Brief**

(i) **Planning Concept (types of industries, facilities, transportation etc)** Town and Country planning/Development authority Classification:

This is ‘A’ Category Project as per EIA Notification 14-9-2006 and requires EC.

(ii) **Population Projection:**

The additional manpower is about 10-15

(iii) **Land use planning (breakup along with green belt etc.):**

Out of total area where Pig Iron Plant is operational, 30% open area is provided.

Photographs of Plant is attached as **Annexure 7.**

(iv) **Assessment of infrastructure demand (Physical as well as social):**

No additional infrastructure is required for capacity enhancement, except Oxygen Plant.

(v) **Amenities / Facilities:**

No additional amenities / facilities is required for capacity enhancement. The existing amenities / facilities are adequate for the BF production enhancement. Save an exception for Oxygen Plant.
6. **Proposed Infrastructure**

There is no change in the land area, except installation of Oxygen Plant

(i) **Industrial Area (Processing Area)**: No change

(ii) **Residential Area (Non Processing area)**: No change

(iii) **Green Belt**: No change

(iv) **Social Infrastructure**: No change

(v) **Connectivity (Traffic and Transportation Road/ Rail/Metro/ Water ways etc)**: No change

(vi) **Drinking Water Management (Source and supply of water)**: No change

(vii) **Sewerage System**: No change

(viii) **Industrial Waste Management**: Changed as per additional handling of raw materials, dust from air pollution control devises and slag from blast furnace. Generation of spent oil and lubricants will remain more or less same. The existing EMP is adequate for the marginal increase in waste.

(ix) **Solid waste Management**: Changed as per additional handling of raw materials, dust from air pollution control devises and slag from blast furnace.

(x) **Power requirement supply and source**: CPP – Waste Heat

Recovery based Power Plant will meet the power demand
7. **Rehabilitation and Resettlement (R & R) Plan**

(i) **Policy to be adopted (Central/ State) in respect of the project affected persons including home oustees, land oustees and landless laborers (a brief outline to be given):**

Not applicable because no additional land will be required for the production enhancement of blast furnaces
8. **Project Schedule and Cost Estimates**

(i) **Likely date of start of construction and likely date of completion (time schedule for the project to be given):**

The existing Pig Iron Plant with 2 Blast Furnaces is already operating. The process optimization could be done without stopping the BF. It will be completed within 6 month of getting EC.

(ii) **Estimated project cost along with analysis in terms of economic viability of the project:**

Around Rs 30-35 Crs will be required especially for setting up of Oxygen Plant.
9. **Analysis of Proposals (Final Recommendations)**

(i) **Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any in the area:**

Financial Benefit
Capital Investment of Rs 30-35 Crs will be required for setting up of Oxygen Plant and for retrofitting energy efficient impeller for the existing blower systems.

Social Benefit
Around 10-15 people will get employment.

The existing Blast Furnaces of 2*173 m³ volume and 2,92,000 TPA production capacity is already operating. The production capacity enhancement to 3,50,000 TPA through process optimization could be done without stopping the BF. It will be completed within 6 month of getting EC.
ANNEXURE 1 : LOCATION MAP
ANNEXURE 2: MAP SHOWING PLANT SITE AND SURROUNDING 10 KM AREA
ANNEXURE 3: GENERAL PLANT LAYOUT SHOWING LOCATION OF BLAST FURNACE
ANNEXURE 4 : PROJECT DESCRIPTION, PROCESS DETAILS & SCHEMATIC FLOW CHART

Project Description
There are 2 Mini Blast Furnaces (MBFs), one being the mirror image of other. Transportation of raw material from storage yard to the stock house is done by trucks transportation. The raw materials are distributed into the respective bunkers through shuttle conveyors located at the top of the stock house bunkers. All materials, stored in different weigh hoppers is charged sequentially into collecting conveyors which is discharged into charging conveyor which in turn feed the material to the blast furnace top charging equipment. Combustion air and combustion gas is pre-heated by heat recovery system using BF gas from the stoves.

A blast furnace (BF) is an enclosed vertical furnace into which the raw materials enter at the top, while the products (molten iron and slag) are tapped from the bottom (the hearth). The raw material mixture of iron bearing materials (iron ore lump and sinter) and additives (slag former, such as limestone) is called the “burden”. The burden and coke are fed into the top of the furnace via a sealed charging system to prevent furnace gases from escaping. Coke reduces iron ore to iron and also supplies heat. Iron ore gets converted to iron and impurities are converted to slag. The solid burden moves downwards, counter current of a rising stream of hot reducing gas. The hot reducing gas is provided by hot stoves and is needed to transfer heat to the solid burden in order to raise the temperature for reaction. The BF gas with residual calorific value is collected from the top of the furnace for treatment and use.

The blast furnace is periodically tapped to remove the hot metal iron and slag from the earth. For this purpose a tap-hole is opened in the side wall of the hearth. The tapped metal has a temperature of approximately 1440-1500 °C. The slag and hot metal from the furnace flows along the refractory or low cement covered runners and they are subsequently separated at the skimmer in the cast house, after which each continues in a separate runner. Liquid Hot metal is poured into ladles or torpedo cars. Slag flows in runners to a granulation plant. At the end of casting cycle, the tap hole is closed by injecting a heat resistant tap hole clay mixture, using a so-called “mudgun”.

Blast furnace gas is reused as fuel in the blast furnace stoves. The molten iron is
PFR for increasing the production capacity of blast furnace from 2,92,000 TPA to 3,50,000 converted to pigs in Pig Casting Machine. The process flow of blast furnace is shown below.

**Process Flow Chart of Plant**

![Diagram of process flow chart of plant]

**Process Flow Chart of Blast Furnace**

![Diagram of process flow chart of blast furnace]
Production Capacity Enhancement Process Details

With in-house experience in operating the blast furnace and experience gathered from similar blast furnaces (Uttam Galva, Jindal Steel, etc), it has been confirmed that the hot metal production can go up to 3,50,000 TPA.

This production increase can be achieved through increased injection of wind volume, oxygen enriched blast, charging high Fe sinter feed up to 50% and better process control in operations (without any change in Blast Furnace – physical expansion or change of product mix). Only Oxygen Plant will be additional installation.

It is possible to enhance the productivity of existing blast furnace in six steps, described below:

I. Production enhancement from 2,92,000 TPA to 313677 TPA can be increased after increasing wind volume from current level of 30000 Nm$^3$/h to 32000 Nm$^3$/h.

II. Production enhancement from 313677 TPA to 320630 TPA can be increased after increasing Fe percentage in burden (iron ore/pellets/sinter) from 56.89% to 58.48%.

III. Production from 320630 TPA to 323840 TPA can be increased after improving plant OEE from current 90.97 % to 91.97 % (OEE can be increased up to 97%)

IV. Production from 323840 TPA to 334805 TPA can be increased by producing basic grade. (from 230000 TPA to 240965 TPA)

V. Production from 334805 TPA to 341501 TPA can be increased by Oxygen enrichment from current level of 0 % to 2 %

VI. Production from 341501 TPA to 350202 TPA can be increased by Increase in sinter from 35% to 50%.
Pollution control devices are capable enough to handle this additional production level and there will be no impact on environment on this account.

Blower which is main equipment decisive for augmenting the production level will be made energy efficient by change of impeller without changing the motor.

The Fe balance of the existing blast furnace (production: 2,92,000 TPA) and that of blast furnace producing 3,50,000 TPA metal is shown in two different Figures shown below.
PFR for increasing the production capacity of blast furnace from 2,92,000 TPA to 3,50,000 TPA,
ANNEXURE 5 : LIST OF RAW MATERIALS AND MATERIAL BALANCE

Material Balance of 2,92,000 TPA and 3,50,000 TPA Production

<table>
<thead>
<tr>
<th>Raw Materials (INPUT)</th>
<th>Quantity for 292 KTPA</th>
<th>Quantity for 350 KTPA</th>
<th>Product (OUTPUT)</th>
<th>Quantity for 292 KTPA</th>
<th>Quantity for 350 KTPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sintered ore</td>
<td>175200</td>
<td>287000</td>
<td>Hot Metal</td>
<td>2,92,000</td>
<td>3,50,000</td>
</tr>
<tr>
<td>iron ore</td>
<td>306600</td>
<td>280000</td>
<td>Slag,</td>
<td>99280</td>
<td>108500</td>
</tr>
<tr>
<td>Coke</td>
<td>182500</td>
<td>189000</td>
<td>Ground Loss</td>
<td>2,920</td>
<td>3,500</td>
</tr>
<tr>
<td>PCI</td>
<td>0</td>
<td>24500</td>
<td>Dust &amp; sludge</td>
<td>4380</td>
<td>5250</td>
</tr>
<tr>
<td>Limestone, dolomite &amp; Quartzite</td>
<td>55,480</td>
<td>30,100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7,19,780</td>
<td>7,86,100</td>
<td>Total</td>
<td>4,18,300</td>
<td>4,67,250</td>
</tr>
</tbody>
</table>

Source of Raw Materials and Transportation:

Iron ore shall be purchased from mines located in Goa. It will be transported mostly by waterways. Jetty already exists near the plant for loading and unloading.

In case iron ore is brought from other locations, it will be transported using rail and road. Rail facility exist upto Madgao / Vasco and road facility exists upto site.

Coke and Sintered ore is available inhouse.

Finished product will be transported using the Jetty and road.

Transportation of raw materials and finished product by road will be minimal.
ANNEXURE 6: CLIMATE DATA

24 Hrs. Wind rose Diagram
Entire study period

00-08 Hrs. Wind rose Diagram
Entire study period

08-16 Hrs. Wind rose Diagram
Entire study period

16-24 Hrs. Wind rose Diagram
Entire study period

PFR for increasing the production capacity of blast furnace from 2,92,000 TPA to 3,50,000
ANNEXURE 7: PHOTOGRAPHS OF EXISTING PLANT

Photographs of Pig Iron Plant

Dust Capture Hoods & Bag House provided for Blast Furnace
PFR for increasing the production capacity of blast furnace from 2,92,000 TPA to 3,50,000

Photograph of wind shield

Photograph rain guns in open yard

Enclosed shed with Dry Fog De-dusting system in Raw material handling Area
PFR for increasing the production capacity of blast furnace from 2,92,000 TPA to 3,50,000

**ANNEXURE 8: AIR MONITORING DATA:**

<table>
<thead>
<tr>
<th>Location</th>
<th>Month</th>
<th>PM10</th>
<th>PM2.5</th>
<th>SO2</th>
<th>Nox</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>November-2015</td>
<td>53.31</td>
<td>21.5</td>
<td>15.79</td>
<td>18.42</td>
</tr>
<tr>
<td></td>
<td>December-2015</td>
<td>71.87</td>
<td>30.1</td>
<td>17.35</td>
<td>20.92</td>
</tr>
<tr>
<td></td>
<td>January-2016</td>
<td>78.92</td>
<td>33.99</td>
<td>14.42</td>
<td>17.86</td>
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<tr>
<td></td>
<td>February-2016</td>
<td>76.22</td>
<td>31.35</td>
<td>13.01</td>
<td>16.39</td>
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<tr>
<td></td>
<td>March-2016</td>
<td>77.81</td>
<td>33.12</td>
<td>13.84</td>
<td>17.56</td>
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<td></td>
<td>November-2015</td>
<td>50.18</td>
<td>21.42</td>
<td>14.19</td>
<td>17.67</td>
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<td>December-2015</td>
<td>66.05</td>
<td>27.72</td>
<td>16.17</td>
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<td>January-2016</td>
<td>76.46</td>
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To,
M/s. Sesa Goa Ltd.,
Altinho,
Pemim (Goa) -403001

Sub: The Proposed Low Phos Pig Iron Plant at Amona / Navelim village.

Sir,

Subsequent to issue of letter No. N-11017/1/Ec/REGN/89-CCOM dt. 5-7-89 by Indian Bureau of Mines, the provisional N.O.C. issued to you vide lr. No. 7/63/89-PCB/44 dated 17-4-1989 has been made final.

This N.O.C. shall be valid upto commissioning of the factory/project and an application in the prescribed proforma for Consent under Section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 should be submitted to the Board 30 days before expiry of this N.O.C.

Yours faithfully,

(Member Secretary) for Goa State Pollution Control Board
Approval from Directorate of Industries & Mines for setting up Pig iron Project at Bicholim dated : 19/1/1990

To,
M/S Sasa Goa Ltd.,
Altinho,
Panaji-Goa,

Sir,

In pursuance of the deliberations held in the High Powered Co-ordination Committee meeting on 29.9.89, I am pleased to convey the approval of the Government of Goa for setting up your proposed Low Phos Pig Iron Project at Bicholim, Goa. You may, therefore, go ahead with the implementation of the project and keep us informed of the developments.

Yours faithfully,

(P. Felix Sequeira)
Director of Industries and Mines.
First consent to operate was granted on date: 1/12/1992 vide letter no: 6/19/92-PCB/617
5. The industry should install three Ambient Air Quality monitoring stations within the factory premises at the boundary limits for determination of SO$_2$, NO$_x$, & OPF. The sampling should be done once in a month for 24 hours, and results should be sent to the Board office regularly.

6. Parameters for monitoring, in addition to pollutant(s) shall include meteorological data of wind speed and direction and the wet and dry bulb temperatures. In cases where there is more than one ambient air quality station, the wind and temperature data may be obtained from only one station.

7. The applicant shall take immediate action to install or modify the emission control equipment to achieve the emission limits prescribed under regular intimation to the Board office.

8. The applicant shall plant trees along boundaries or premises in the area to prevent dust spreading to adjoining areas.

9. The applicant shall take all those necessary steps to maintain the good and healthy ambient air quality in and around the industry.

10. An application shall be made for renewal of consent in the prescribed form atleast 30 days before the date of expiry of consent order.

11. The Goa State Pollution Control Board reserves the right to add any new consent condition or amend the existing one in the consent issued herewith.

12. This consent would automatically stand revoked in case of not meeting any of the above condition by the applicant.

(Signed)

Secretary
Goa State Pollution Control Board