PRE-FEASIBILITY REPORT

For

Existing 8.16 MMTPA Iron Ore Pelletisation & Captive power plant of 25 MW along with proposed fuel change from LSHS (Fuel oil) to Natural Gas (Fuel Oil as stand by)

at

Near Fly Over, Scindia Road,

Visakhapatnam, A.P - 530 004

of

ArcelorMittal Nippon Steel India Limited

March 2022

Prepared by:

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TABLE OF CONTENTS

LIST OF TABLES

1. Executive Summary

ArcelorMittal Nippon Steel India is one of India's leading integrated steel producers with an annual production capability of 9.6 million tonnes, supported by a 20-milliontonne pellet-making capability.

The state-of-the-art facilities comprise iron ore beneficiation, **pellet making,** iron making, steel making, and downstream facilities, including a cold rolling mill, a galvanizing and pre-coated facility, an extra-wide plate mill, three pipe mills with coating facilities, and steel-processing facilities.

ArcelorMittal Nippon Steel has the widest range that spans the spectrum of steel products encompassing over 300 grades of steel and value-added products – and backed by a production capacity that's amongst the largest in the continent – Arcelor Mittal Nippon Steel is where your search for the best in steel ends.

ArcelorMittal Nippon Steel is known for the high quality of our flat steel products and supply to customers both in India and abroad. AMNSI teams work closely with customers to develop new grades of steel customized to suit their specific requirements.

AMNSI focus on high value-added grade steels, many of which are import-substitute products. Among integrated steel producers, AMNSI have the widest range of flat steel products that cater to a diverse section of industrial segments – from automobiles, shipbuilding to defence.

As one of the critical inputs for our steel plant at Hazira, AMNSI are the largest pellet producer in India with a capacity of 14 million tonnes with another 6 million tonne pellet capacity under completion. AMNSI operate two pellet facilities – one each at Visakhapatnam, Andhra Pradesh and the other in Paradeep, Odisha. The pellet plants produce DR and BF grades of pellets using iron-ore concentrate/fines.

AMNSI actively promotes environmental responsibility as one of its core business values which is reflected in its operations being certified to ISO 14001: 2015 standard. AMNSI has initiated estimation of Greenhouse Gas inventory from its manufacturing plant in the same spirit. AMNSI management may consider reporting GHG emissions as another key performance indicator in their commitment towards voluntary reporting platforms. AMNSI may also consider individually reporting to global stakeholders in such platforms in order to showcase its commitment to environmental values and increase transparency in stakeholder communication.

ArcelorMittal has taken up the daunting task of aligning their business with "Carbon Neutral Steel by 2050" target as per Paris Agreement and has taken up targets voluntary to reduce certain products from EU geography to go carbon Neutral.

The project 8.16 MMTPA Iron ore Pellet plant and 25 MW captive power plant at Near Fly Over, Scindia Road, Visakhapatnam – 530 004, Andhra Pradesh of AMNS is an existing unit in operation since 1996. It has a plant area of 44.5154 ha (110acre) and 18.25ha (45.10 acre) used for stockpile outside the plant area. The project is for obtaining

Environment Clearance for existing 8.16 MTPA Pellet Plant with a CPP of 25 MW. Furthur MoEF&CC has directed to apply under 7(ii) of EIA notification for the fuel change from fuel oil to natural gas.

The existing plant lies between 17°43' 20.21"N to 17o43’ 00.50” N Latitude and 83°16' 14.87"E to 83o16’ 49.65” E Longitude in Survey of India Toposheet No.650/1, 650/5, 650/2 and 650/6, at an elevation of 1 m AMSL.

Pellet Plant: Process Description

The process steps for steel production in sequence are as follows: -

- Slurry Receipt & Filtration
- Filtration
- Grinding of Anthracite coal & Limestone and Bentonite
- Mixing of Filter cake and Additives
- Balling
- Induration
- Product, Hearth & Side-Layer Handling
- Pellet Product to Stockpile and Reclamation

The plant water requirement is 6,550 m^3/day for Iron ore pelletisation, for captive power plant is 3655 m^3/day and total put together it is estimated at 10,205 KLD for 8.16 MMTPA capacity and net 25 MW captive power plant. Water from slurry received through pipe line from NMDC, Kirandul as a raw material is 9120 KLD and 1200 KLD from GMVC water supply making a total of 10320 KLD.

The total power requirement for operating the pellet plant is 40 MW of which in plant net generation is 25 MW and the balance 15MW is drawn from APTRANSCO.

Since the modernisation project will be taken up within the existing land boundary, therefore this project is not envisaged any R&R issue.

Pelletisation plant complex is an ISO 9001, 14001 & OHSAS 45001 integrated certified company committed to comply with all the Environmental guidelines and notifications.

Since inception, the PP has been upgrading pollution control equipments with latest the then available technologies in order to achieve air emission norms being notified by CPCB and MoEFCC and APPCB from time to time. Retrofitted the ESPs in the processes of pellet manufacturing for bringing down emissions from originally permitted norm of 115 mg/nm3 as in 1996 to the existing norm of 50 mg/nm3 as prescribed presently in the CFO granted by APPCB. Stack emission norms are always well within the permitted limits as prescribed by the APPCB and uploaded the data continuously to APPCB web site as per the directives of APPCB.

PP has provided necessary air pollution control equipment’s like high efficient reverse jet technology bag filters, wet scrubbers at two transfer houses as pollution control measures.

Now as a part of continued efforts for sustainable environment this proposal of change fuel from fuel oil to natural gas will further reduce the pollution of SO_2 by 99 percent and CO_2 by 16 percent.

A well-developed green belt is in place within the plant area. A total number of 48.95 acre out of 110acre (44.5%) is covered under plantation with 49537 number of trees.

Due unstinted efforts towards preserving the better environment, Govt. of Andhra Pradesh awarded the Vizag unit : "Green Award in 2017" under Corporate Sector.

This proposal is grant of TOR duly exempting the public hearing in view of change of fuel.

2. INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION

2.1 Identification of project and project proponent.

The project 8.16 MMTPA Iron ore Pellet plant and 25 MW captive power plant at Near Fly Over, Scindia Road, Visakhapatnam – 530 004, Andhra Pradesh of AMNS is an existing unit in operation since 1996. It has a plant area of 44.5154 ha (110acre) and 18.25ha (45.10 acre) used for stockpile outside the plant area. The project is for obtaining Environment Clearance for existing 8.16 MTPA Pellet Plant with a CPP of 25 MW. Furthur MoEF&CC has directed to apply under 7(ii) of EIA notification for the fuel change from fuel oil to natural gas.

The project M/s ArcelorMittal Nippon Steel India Limited (Formerly Essar steel India limited), one of the largest pellet production facilities in India. The pellet-making facility of AMNS India Vizag is located at the port town of Visakhapatnam on the east coast of India in close proximity to large consuming centres of Asia and the Middle East.

M/s ArcelorMittal Nippon Steel India Limited (Formerly Essar steel India limited) has the following existing operational production capacity:

Table 2.1: Details of Existing Production Capacity

Name of the Units	Production Capacity	CTE from APPCB	CTO from APPCB & Validity	Operational Unit as per valid CTE
Pelletisation Plant	8.16 MTPA	Order No. 13060/PCB/G.ESTT (RO -VSP)/EE/2-2001 Date: 13.03.2001	APPCB/VSP/VSP/111/ CFO/HO/2019 Date:04/10/2019 Amendment: APPCB/VSP/VSP/111/ CFO/HO/2020 Date: 28.03.2020	8.16 MTPA
Captive Power Plant	25 MW(Net)	Order No. APPCB/VSP/111/ HO/2003/65-1728 dt: 19.9.2003	APPCB/VSP/VSP/111/ CFO/HO/2019 Date:04/10/2019 Amendment: APPCB/VSP/VSP/111/ CFO/HO/2020 Date: 28.03.2020	25 MW

Table 2.2: Details of Existing Production Capacity

Sl No.	Product	Existing Capacity in operation	Proposed Capacity	Total
1.	Pelletisation Plant-I	11,000 (TPD)	NIL	11,000 TPD
2.	Pelletisation Plant-II	12,333 (TPD)	NIL	12,333 TPD

Sl No.	Product	Existing Capacity in operation	Proposed Capacity	Total
3.	Captive Power Plant net generation	25 MW	NIL	25 MW

2.2 Brief Description of Nature of the Project: -

- M/s ArcelorMittal Nippon Steel India ltd established 4 MMTPA Pelletisation plant in 1996.
- Later M/s Arcelor Mittal Nippon Steel ltd, went for expansion of the Pelletisation plant from 3.3 MMTPA to 8.16 MMTPA under-II envisaging to carry the beneficiated ore fines in slurry form from the beneficiation plant located at Kirandul, Chhattisgarh state.
- M/s ArcelorMittal Nippon Steel ltd also established a Coal based captive power plant to generate Electricity of net 25 MW for captive use.
- M/s ArcelorMittal Nippon Steel India Limited (formerly M/s Essar steel ltd) proposed a change of fuel project from LSHS to Natural Gas- 0.4 MMSCMD (LSHS/FO fuel as standby).

2.3 Need for the Project and its importance to the Country and/or Region

This is an existing project, in operation since 1991. The development of industrial projects plays a key role in the economic growth of any country. Iron is the most important metal to the mankind and its principal alloy steel is widely used for domestic, agricultural, industrial and defense purposes. Per capita steel consumption is a major indicator of economic status of any country.

- In FY 2019, the world crude steel production reached 1870 million tonnes (MT) and showed a growth of 3.4% over FY 2018.
- China remained world's largest crude steel producer in the same period (996 MT) followed by India (111 MT), Japan (99 MT) and the USA (88 MT).
- The Indian steel industry has entered a new development stage, post de-regulation, riding high on the resurgent economy and rising demand for steel. Rapid rise in the production has resulted in India becoming the 2 nd largest producer of crude steel during 2018 and 2019, from its 3rd largest status in 2017.
- The country was also the largest producer of sponge iron or DRI in the world and the 3rd largest finished steel consumer in the world After China; USA in 2019.
- With emphasis on ATMANIRBHAR BHARAT and following the clarion call of our Prime minister to achieve a target of 300 MMTPA production by 2030, AM/NS INDIA has decided to produce the iron ore pellets in a best possible environmental friendly

approach at Vizag, Andhra Pradesh. Pellets are a major raw material for steel marking and is utilized in-house.

Indian Market Scenario:

India is expected to be the fastest growing steel market globally. Government targets crude steel capacity of 300 MTPA by 2030. Estimates by various consultants like MB, Wood Mackenzie suggests approx 290-295 million tons crude steel production by 2040. This is substantial capacity increase considering current crude steel production is 106 million tons. The primary route for steel making will be BF-BOF but the strikingly differentiating factor will be the usage of pellets especially by the integrated steel plants – accounting for 70% of BOF steelmaking capacity. Pellet charge rates in India's BFs is expected to increase from 164 kg/ton to 421 kg/ton. This translates to a substantial increase in pellet consumption from current levels of 50 million tons to 140-150 million tons pellet demand by 2040. This increase in pellet usage is offset by fall in sinter demand. Assuming current installed pellet capacity of 96 million tons, there is a massive gap that will result as steel making capacity increases in India. Unless the capacity of pelletisation is increased, it is expected that India will cease being a pellet exporter by 2020/21 and turn net pellet importer, that will not be economically favourable development and will let go an opportunity to add to the manufacturing capacity as well as additional jobs.

Additional demand of Iron ore pellet is also expected due to following reasons:

1. Phasing out of Sinter Plants which provide major feed to the Blast Furnaces due to environmental issues.
2. Availability of Iron Ore lump is diminishing and cannot meet the full requirement of Steel making world over.
3. Due to the environmental issues, the developed world based with excess scrap availability, the steel making route is increasing through DRI-EAF route, particularly, in the region, which is in endowed with availability of natural gas.
4. Indian Pellets are cost competitive in the export markets vis-à-vis other suppliers like Brazilian pellets due to the use of lower grades of ore used for production of Pellets.

2.4 Demand Supply Gap

The total recoverable reserves of iron ore in India are about 9,602 million tonnes of hematite and 3,408 million tonnes of magnetite. However, the country has inadequate infrastructure for catering to the iron ore demands of all the DRI / Steel plant. The excessive fines generated from iron ore crushing units are mostly going waste.

In order to meet the ever-increasing demand of steel and demand of pellets by a large no of sponge iron units in the country, it is envisaged to maximize the capacity of iron ore fines pellet plant. The feed material for the above will be iron ore fines of size below 10mm which shall be available from captive iron ore mines of the Group.

2.5 Imports vs. Indigenous production

Indian steel plants mainly cater to the domestic demand. Special steels which are not manufactured in the country are imported like CRGO, HSS, and Steels for defence, space, nuclear sectors, etc. where special steels in various grades and smaller quantities are required. However, due to dumping of steel at very cheap prices by some foreign countries, low quality steels also get imported at prices not remunerative to domestic steel producers.

2.6 Export Possibility

Production will be done to meet the growing demand of Steel in the country. Priority will be given to domestic markets. However, in future export possibility is envisaged if economically viable.

2.7 Domestic/ Export Markets

Pellets of this plant are being utilized mostly for captive usage.

2.8 Employment Generation (Direct and Indirect) due to the project.

Operation and maintenance of pellet plant requires human resources in different categories like managers, engineers of different discipline like metallurgical, mechanical, electrical, electronics, computer, civil, structural, chemical etc., highly skilled, skilled and semi-skilled work force in different discipline, commercial, accountants and financial managers, unskilled labour force, clerical, security personal etc. At present the manpower engaged in the existing plant operations directly /indirectly about 1050 nos.

The detail Breakup of the employees is given in the Table below:
Table 2.3: Total Manpower Details

Manpower	Managerial	Supervisory	Skilled	Semiskilled	Unskilled	High Skilled	Total
Existing	33	92	201	136	443	45	**950**

3. PROJECT DESCRIPTION

3.1 Type of Project including interlinked and independent projects if any

This is an existing pelletisation plant with a production capacity of 8.16 MTPA pellet with a captive power plant of 25 MW (Net) is in operation since 1991.

3.2 Location (Map showing specific location, project with boundary, project site layout with coordinates)

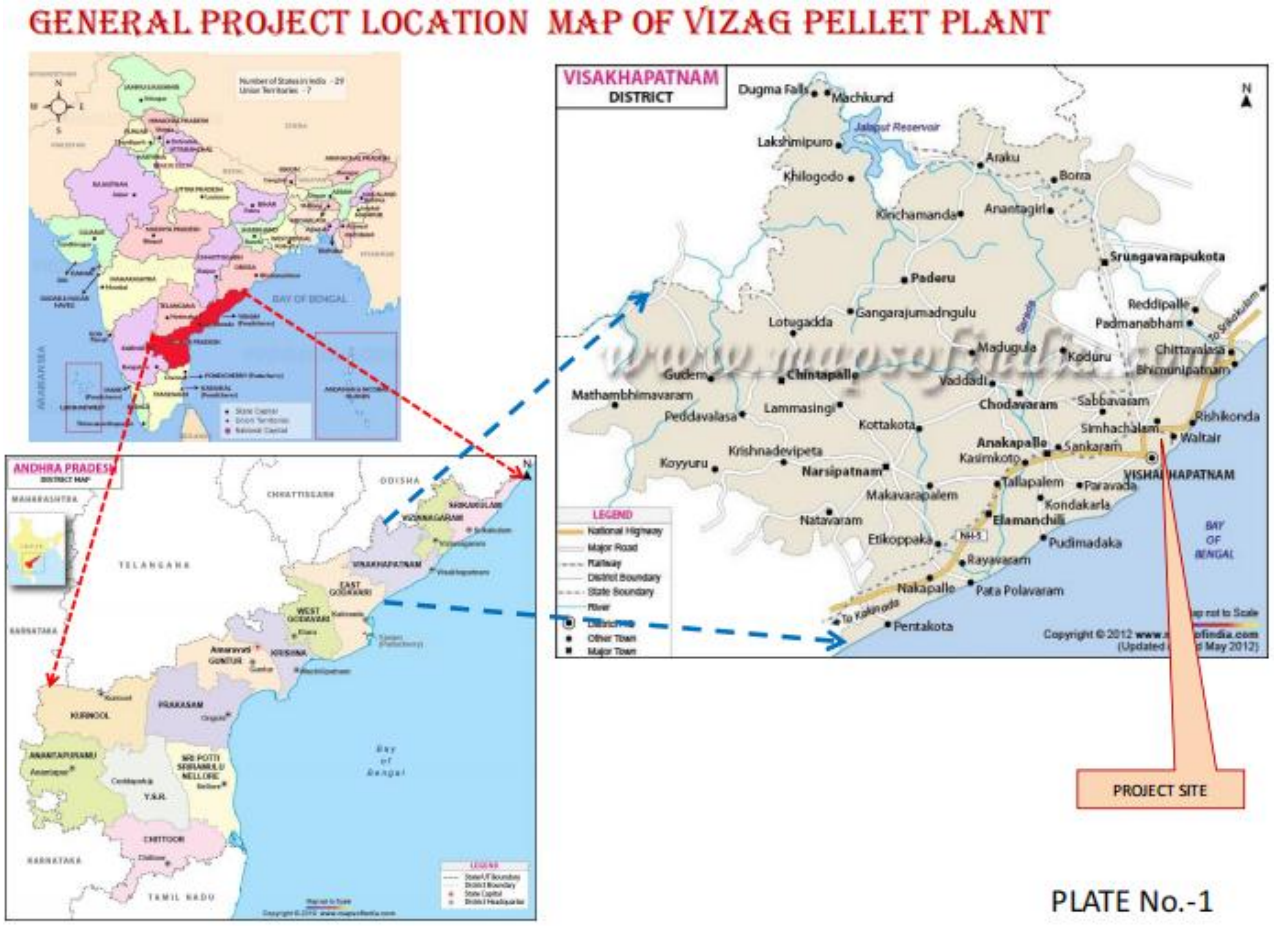


Fig 3.1: General Location map

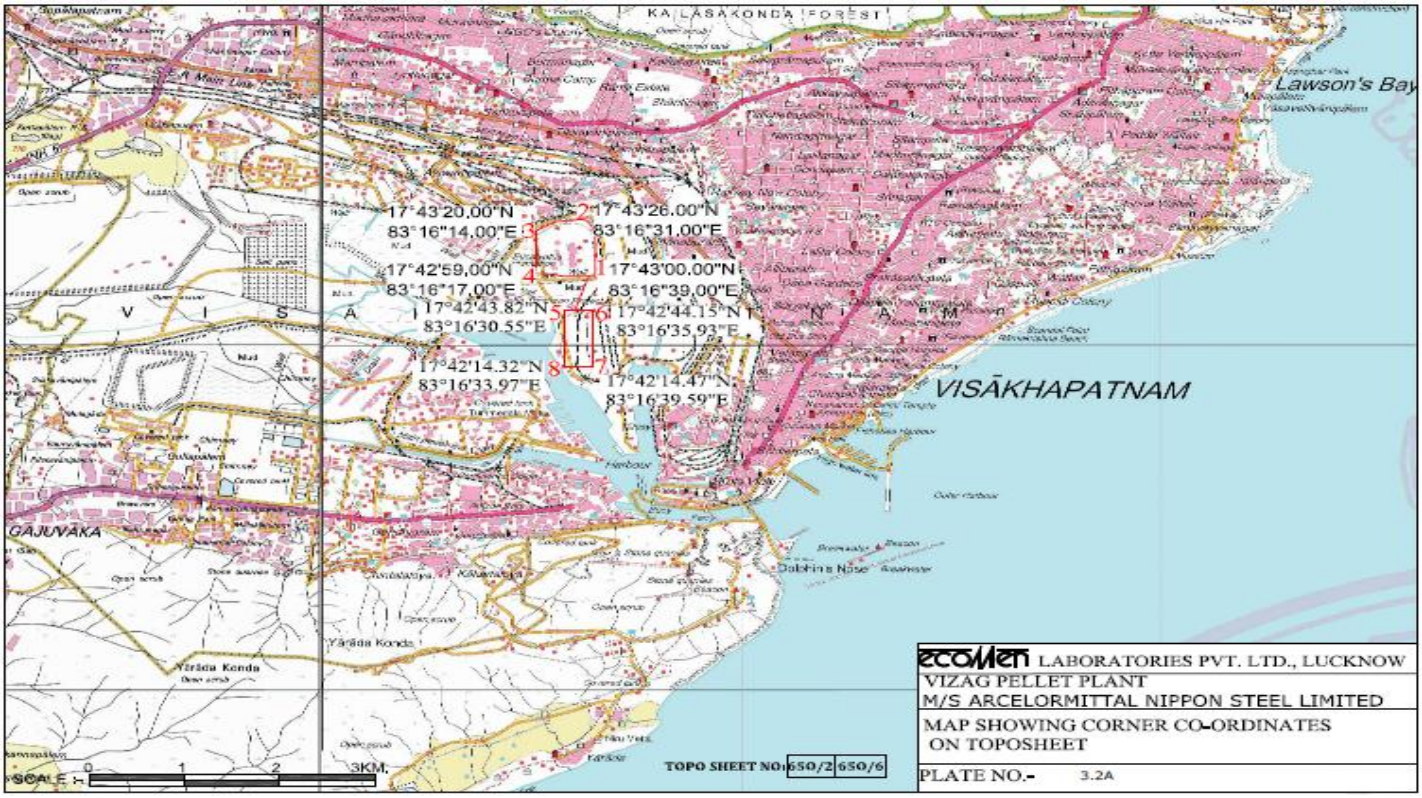


Fig 3.2A: Specific Location Map

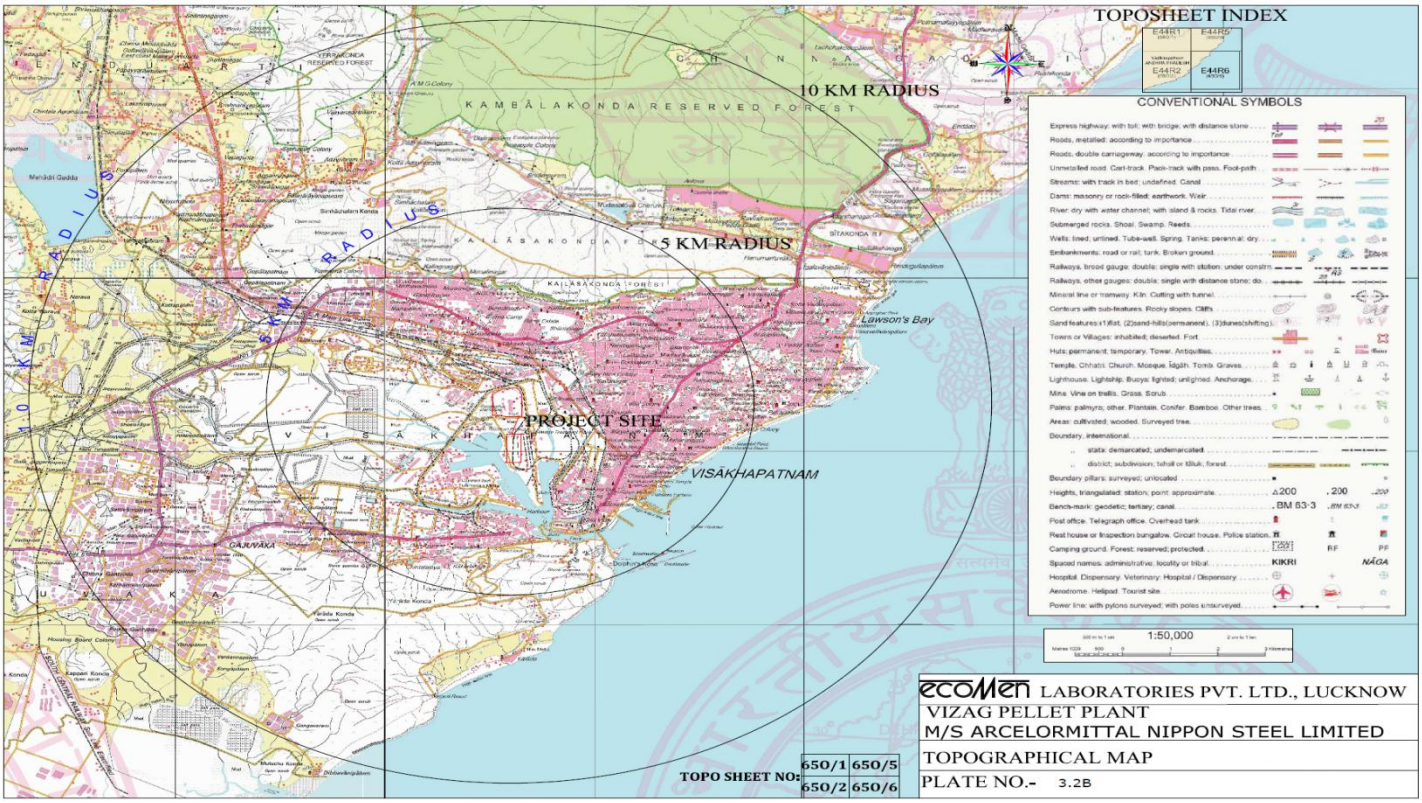


Figure 3.2B: Topographical Map of the Plant site with plant boundary.

Fig 3.3A project site layout with coordinates

STATEMENT OF BUILT UP AREAS (INDEX TABLE - 1)

S.NO:	DISCRIPTION	SIZE IN MTRS	AREA IN SQM
1.	THICKENER	50.00mØ	1965.00 Sq.m
2.	SLURRY TANK (2NOSX14.00MØ)	14.00mØ	308.00 Sq.m
2A.	SLURRY TANK (2NOSX20.00MØ)	20.00mØ	628.30 Sq.m
2B.	COMPRESSOR ROOM	6.00MX6.00M	36.00 Sq.m
3.	FILTERING AND BALLING BUILDING	110.00MX20.00M	2200.00 Sq.m
3A.	FILTERING AND BALLING BUILDING	110.00MX20.00M	2200.00 Sq.m
4.	INDURATING BUILDING	140.00MX16.00M	2240.00 Sq.m
4A.	INDURATING BUILDING	146.00MX16.00M	2336.00 Sq.m
5.	PROCESS FAN AREA (OPEN YARD)	130.00MX40.00M	5200.00 Sq.m
5A.	PROCESS FAN AREA (OPEN YARD)	130.00MX40.00M	5200.00 Sq.m
6.	HEARTH LAYER SEPARATION	11.00MX19.00M	209.00 Sq.m
6A.	HEARTH LAYER SEPARATION	11.00MX19.00M	209.00 Sq.m
7.	CONTROL ROOM	30.00MX10.00M	300.00 Sq.m
8.	COOLING TOWER WITH PUMP HOUSE	40.00MX10.00M	400.00 Sq.m
8A.	COOLING TOWER WITH PUMP HOUSE	40.00MX10.00M	400.00 Sq.m
9.	ADDITIVE GRINDING BUILDING	40.00MX10.00M	400.00 Sq.m
9A.	COKE & FLUX GRINDING BUILDING	32.00MX25.00M	800.00 Sq.m
10.	JUNCTION TOWER	6.00MX18.00M	108.00 Sq.m
11.	CONVEYOR GANTRY	110.00MX15.00M	1650.00 Sq.m
11A.	PELLETS COOLING CONVEYOR	3.93MX130.00M	510.90 Sq.m
11B.	CONVEYOR GANTRY	110.00MX15.00M	1650.00 Sq.m
12.	DEDUSTING UNIT	8.00MX12.00M	96.00 Sq.m
12A.	DEDUSTING UNIT	8.00MX12.00M	96.00 Sq.m
13.	PUMP HOUSE (PP1)	20.00MX21.00M	420.00 Sq.m
13A.	PUMP HOUSE (PP2)	20.00MX21.00M	420.00 Sq.m
13B.	PUMP HOUSE TRANSFORMER	9.00MX12.00M	108.00 Sq.m
14.	L.R.S HUT	4.00MX6.00M	24.00 Sq.m
14A.	L.R.S HUT	4.00MX6.00M	24.00 Sq.m
15A.	FILTER CAKE STOCKPILE	68.00MX32.00M	2176.00 Sq.m
16A.	CONVEYOR TRIPPER		
17A.	FILTER CAKE CONVEYOR	3.93MX78.00M	306.54 Sq.m
19A.	WATER TREATMENT PLANT	6.00MX10.00M	60.00 Sq.m
21.	BENTONITE STORAGE	18.00MX36.00M	648.00 Sq.m
22.	Additive Storage (Open Storage Area)		
23.	TRUCK UNLOADING HOPPER	5.00MX5.00M	25.00 Sq.m
24.	ORE BINS	8.00M Ø	50.00 Sq.m
25.	COKE BINS	8.00M Ø	50.00 Sq.m
26.	BALL MILL BUILDING	60.00MX35.00M	2100.00 Sq.m
27.	PELLET CONVEYOR	(3.93MX230.00M)	903.90 Sq.m
27A.	PELLET CONVEYOR	(3.93MX230.00M)	903.90 Sq.m
27B.	PELLET CONVEYOR-2	(3.93MX230.00M)	903.90 Sq.m
28.	ORE FINES CONVEYOR	(3.93MX960.00M)	3772.80 Sq.m
28A.	ORE FINES CONVEYOR-7	(3.93MX960.00M)	3772.80 Sq.m
29.	FUEL OIL STORAGE (FO Installation)	10.00M Ø	79.00 Sq.m
30.	SWITCH GEAR ROOM	30.00MX10.00M	300.00 Sq.m
31.	M.R.S.S (OPEN YARD)	58.00MX45.00M	2610.00 Sq.m
32.	A,P,S,E,B SWITCH YARD (OPEN YARD)	50.00MX45.00M	2250.00 Sq.m
33.	PUMP HOUSE (MAIN WATER)	42.00MX10.00M	420.00 Sq.m
34.	Process Water Reservoir (BASE AREA)	10MG CAPACITY	16860.00 Sq.m
35.	MUNCIPAL WATER RESERVOIR		
36.	OVER FLOW LAUNDER	92.00M Long Pipe Line	
37.	WEIGH BRIDGE	15.00MX15.00M	225.00 Sq.m
38.	PELLET LOADING HOPPER	6.00MX3.00M	18.00 Sq.m
39.	CHIMNEY PP1	5.00MX5.00M	25.00 Sq.m
39A.	CHIMNEY PP2	5.00MX5.00M	25.00 Sq.m
40.	PP1- ESP1	48.00MX60.00M	2880.00 Sq.m
40A.	PP2- ESP2	48.00MX60.00M	2880.00 Sq.m
41.	MCC FOR PP1-ESP1		132.34 Sq.m
41A.	MCC FOR PP2-ESP2	13.06MX7.25M	94.68 Sq.m
46.	PROJECT OFFICE (ADMN BUILDING)	36.00MX24.00M	864.00 Sq.m
47.	MAIN STORES AND WORKSHOP	90.00MX18.00M	1620.00 Sq.m
47A.	PROJECT STOR	29.00MX18.00M	522.00 Sq.m
47B.	OPEN STORAGE YARD		
48.	SECURITY AND GATE COMPLEX	10.00MX4.00M	40.00 Sq.m
48A.	Security and Gate Complex(METERIAL)	27.00MX13.00M	351.00 Sq.m
49.	EXECUTIVE CARPARKING AREA(Open)		
51.	DEISEL STORAGE YARD PUMP ROOM	3.00MX2.50M	7.50 Sq.m
52.	DINING&REST ROOMS (Workers Facility)		514.19 Sq.m
53.	CONVENTINALTHICKNER	55.00MØ	2375.82 Sq.m
54.	4TH Ball Mill (Inside Existing Ball Mill Building NO.26)		
56.	PUMP HOUSE SHED	5.00MX12.00M	60.00 Sq.m
58.	BAG HOUSE	3.00MX06.00M	18.00 Sq.m
59.	CONVEYOR 2A		
59A.	CONVEYOR 2B		
61.	COOLING AIR FAN		
62.	Pressure Filter Building (AT LVL 0.00M)	56.00MX16.60M	929.60 Sq.m
	Pressure Filter Building (AT+6.05M LVL)		283.30 Sq.m
	Pressure Filter Building (AT+11.05M LVL)		476.50 Sq.m
	Pressure Filter Building (AT +15.5M LVL)		403.30 Sq.m
63	LPG GAS Cylinders Storage Godown	5.33MX3.96M	21.10 Sq.m
64.	GAS CYLINDERS STORAGE GODOWN	5.26MX9.96M	52.38 Sq.m
65.	BENTONITE STORAGE SHED	120.60MX46.60M	5619.96 Sq.m
66.	HEARTH LAYER SCREENING SYSTEM		
67.	HLSB COVERED SHED	61.25MX24.65M	1509.81 Sq.m
68.	ADMIN BUILDING-2 (GF & FF)		1534.54 Sq.m
69.	NATURAL GAS PRESSURE REDUCING STATION (NGPRS)		143.60 Sq.m
	TOTAL PLANT BUILTUP AREA		91,956.66 Sq.m

STATEMENT OF BUILT UP AREAS CAPTIVE POWER PLANT (INDEX TABLE -2)

S.NO:	DISCRIPTION	SIZE IN MTRS	AREA IN SQM
I.	COAL STORAGE YARD (OPEN AREA)	(60.00MX160.00M)	9600.00 Sq.m
II.	COVERED COAL STORAGE SHED(2 NOS)	(36.00MX20.00M)	1440.00 Sq.m
III.	COAL HANDLING PLANT (2 NOS)	(8.00MX8.00M)	128.00 Sq.m
IV.	COAL BUNKERS	(14.00MX7.00M)	98.00 Sq.m
V.	AFBC BOILER	(33.00MX13.00M)	429.00 Sq.m
VI.	ESP	(26.00MX7.00M)	182.00 Sq.m
VII.	CHIMNEY	4.30MØ	14.52 Sq.m
VIII.	TG BUILDING	(35.00MX40.00M)	1400.00 Sq.m
IX.	COOLING TOWER	(15.00MX35.00M)	525.00 Sq.m
X.	DM & RO PLANT	(20.00MX27.00M)	540.00 Sq.m
XI.	132KV SWITCH YARD	(27.00MX27.00M)	729.00 Sq.m
XII.	RAW WATER TANKS	(60.00MX40.00M)	2400.00 Sq.m
XIII.	MCC BUILDING	(8.00MX16.00M)	128.00 Sq.m
	TOTAL AREA		17613.52 Sq.m

STATEMENT OF PARKING AREAS (INDEX TABLE - 3)

S.NO:	DISCRIPTION	SIZE IN MTRS	AREA IN SQM
49A.	EXECUTIVE PARKING	10.00M X 24.00M	240.00 S.qm
49B.	STAFF PARKING	10.00M X 60.00M	600.00 S.qm
49C.	VISITORS PARKING	20.00M X 38.00M	760.00 S.qm
50A.	VISITIRS PARKING	10.00M X 20.00M	200.00 S.qm
50C.	TRUCK PARKING AREA	120.00M X 100.00M	12000.00 S.qm
	TOTAL PARKING AREA		13800.00SQM

Fig 3.3B List of Plant components

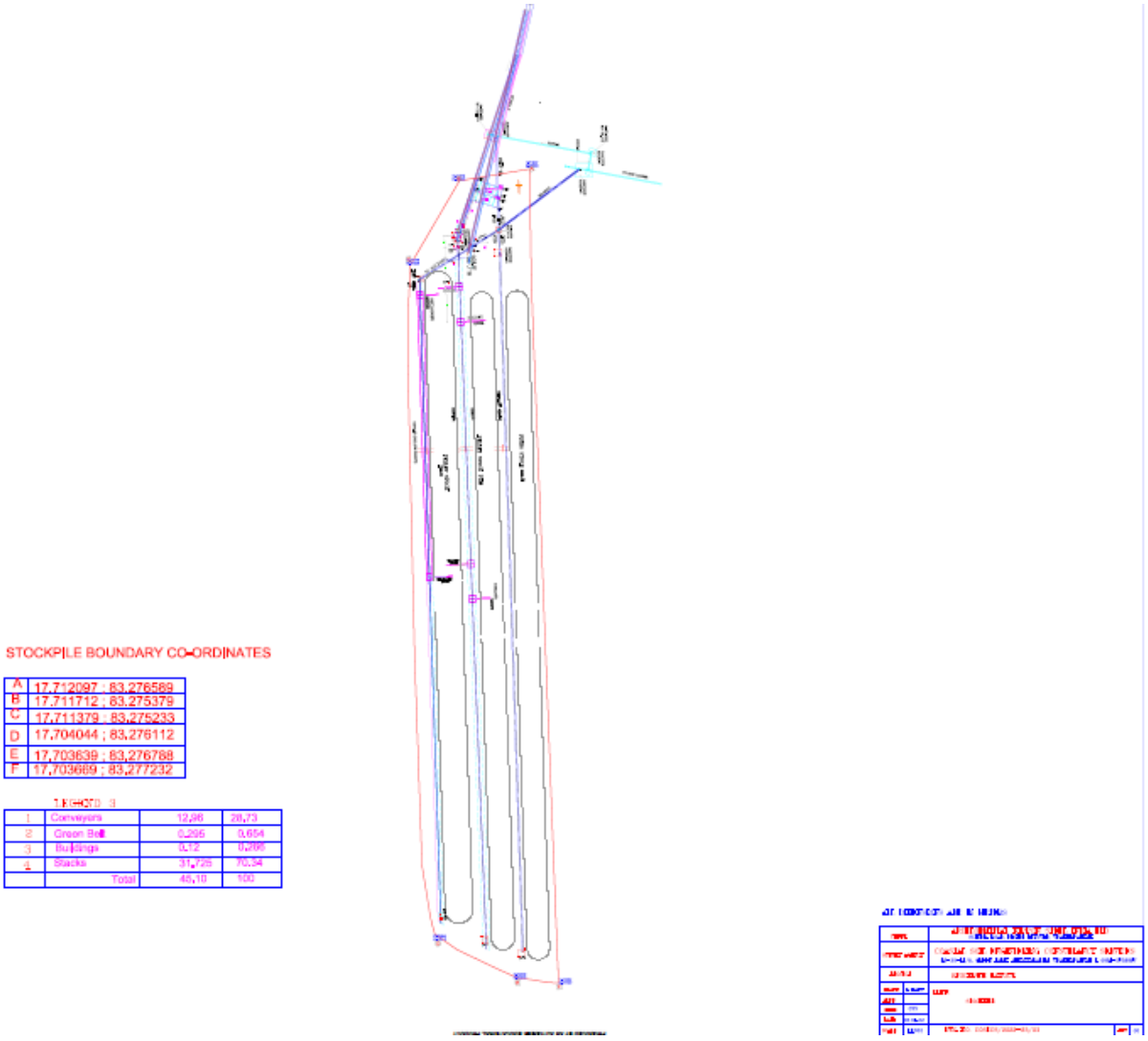


Fig 3.3C Stockpile area layout

3.3 Details of Alternate Sites Considered and the Basis of Selecting the Proposed Site, Particularly the Environmental Considerations gone into should be Highlighted.

No alternate site has been considered as it is an existing project since 1996.

3.4 Size or Magnitude of Operation

As per EIA Notification dated 14/08/2006 as amended from time to time, this project falls under S. No. 3 (Iron Ore pelletisation), Project Activity '3(a)' Metallurgical Industries. The total cost of the project is 1307.98 Crore. The existing facilities are used to produce 8.16 MTPA. It is proposed to change the fuel from existing LHSH to Natural gas (LSHS fuel as standby). The total area of the plant is 44.5154 ha (110acre). An area of 18.25 ha (45.10 acre) outside the plant is used for stock pile.

3.5 Project description with process details (a schematic diagram/ flow chart showing the project layout, components of the project etc. should be given).

PROJECT DESCRIPTION

Iron Ore Pellet Plant

General

The pellet plant has a full capacity of 8.16 MTPA with 25 MW Captive power plant.

Design Criteria: Pellet Plant

Description	**PP-1**	**PP-2**
Ore Type	Hematite	Hematite
Ore Source	NMDC Kirandul	NMDC Kirandul
Capacity	3.90 MMTPA/458tph	4.37 MMTPA/513tph
Grate Area	420m^2	444m^2
Grate Factor	23.8ton/m^2	27.3ton/m^2
Total Length of Furnace	105 m	111mts
Bed height	460mm	460mm
No of Working days	350	350

Design criteria: Captive Power Plant

Description	**Specification**	**Make**
Boiler	Type: AFBC Capacity: 125 TPH Rated Steam pressure: 67kg/cm^2. Steam temp: 495Deg. Cent Fuel Steam Coal Imported	M/s Cethar Vessels Limited
Steam Turbine	Type: Impulse, reaction turbine with single cylinder Speed: 3000rpm, Stages:25 Steam Pressure: 57 bar, temp: 490Deg.cent	M/s SKODA (Purchased from Sweden)
Generator	Rating: 35 MW Speed: 3000rpm Rated Current: 2145A Rated Voltage: 10.5 V	M/s SKODA (Purchased from Sweden)

Description	Specification	Make
	Static Excitation, Air cooled	
Transformers	ICT(40MVA/2200A/10.5KV/132KV):1 no UAT-1 (25MVA): 1 no UAT-2 (20 MVA): 1no SST-1,2 (2 MVA): 2 no	M/s National Industry,M/s Voltamp,M/s Alstom
Coal Handling system	Capacity: 70 TPH Crusher- 1 no Bag Filters Feed: less than 50mm size coal Output: 8mm	M/s ABB
ESP	No of Field:4 nos Gas flow: 219096Am3/hr Inlet Dust Emission: Out Let Dust Emission: 50mg/nm^3	M/s THERMAX
Ash Handling system	Type: Dense Phase fly ash handling system Modes of unloading: dry/wet No of silos: 1 nos	M/s Macawber Beekay Pvt. Limited
DM Plant	Capacity: 2X5 m3/hr No of Storge Tanks: 2 nos (150m^3 each)	M/s Techno Aquatech
Water source	Raw Water Tank Volume: 2000m^3, RCC Soft Water plant: 1X125TPH Soft water tank: 1000m^3 RCC	M/s Techno Aquatech
Fire Fighting Systems	Fire Water tank: 500m^3 Main Pump: 70M/273m^3/hr/75kw Diesel pump: 70M/250m^3/hr Jockey pump: 70M/10.8m^3/hr/9.3kw	M/s Beacon/Kirloskar

3.6 Raw materials, Quality, and source

The Raw materials required for the proposed pellet plant are iron ore Concentrate, additives like Bentonite, limestone, and Anthracite coal.

A brief description of the requirement and quality of Raw materials and sources of their availability are as follows

a) Raw materials requirement

Raw materials requirement (dry basis) for 8.16 MTPA pellet plant is as follows. Common facilities like slurry pipelines, raw material handling system, product storage yard, electrical switch yard, transformers, FO unloading point, FO/LDO storage facility, Additive grinding building, thickener, filtration unit.

Raw materials (basis@350days)	Annual requirement, t	Daily requirement, t	Hourly requirement, t
Iron ore Concentrate (1:1)	82,00,000	23098	962
Limestone(16kgs/t)	1,31,200	369	15.39
Bentonite(10.03kg/t)	82,000	230.9	9.62
Mill Scale	3,00,000	857.14	35.71
Anthracite coal (14.15kg/t) (for PP)	1,16,030	326.8	13.61
Steam Coal (for CPP)	1,77,500	500.00	20.80

Raw material Source and Mode of transportation:

Raw Material Required	Quantity in Tons per Annum	Source	Distance from site (Kms)	Mode of Transportation	Nearest Sea port
Iron ore Concentrate	82,00,000	Slurry Pipeline/Railway rakes	267	Pipeline	-
Limestone	1,31,200	Dubai	2894	Sea route	Visakhapatnam
Bentonite	82,000	Kandla Gujarat	2077	Sea route	Visakhapatnam
Anthracite Coal (for PP)	1,16,030	Russia /Ukraine	9364	Sea route	Visakhapatnam
Steam Coal (for CPP)	1,77,500	Indonesia	2240	Sea route	Visakhapatnam
Fuel oil	1,05,000	HPCL	15	By Road	Visakhapatnam
Mill Scale	3,00,000	Hazira	2100	Sea Route	Visakhapatnam

Raw Material Required	Quantity in Tons per Annum	Source	Distance from site (Kms)	Mode of Transportation	Nearest Sea port
Proposed Raw material for the change fuel project					
Natural gas	0.4MMSCMD	GAIL/APGDC	Pipe Line	Pipe line	Visakhapatnam

b) Raw materials quality

Average chemical composition of raw materials required for the Pellet production is as follows.

Raw Material	Fe (t)	FeO	Fe_2O_3	SiO_2	Al_2O_3	CaO	MgO	LOI	Remarks
Iron Concentrate	65.18	0.38	93.19	2.85	1.29	0.20	0.05	2.30	65.18
Anthracite Coal %	-	--	--	--	--	--	--	90.00	
Bentonite, %	12.33		17.63	49.17	16.88	2.86	1.90	11.00	
Limestone, %	11.00		0.40	1.16	0.20	54.00	0.81	42.00	
Raw Material (Captive Power Plant)									
Steam Coal (for CPP)	Moisture (ADB)	Ash (ARB)	VM (ADB)	FC (ADB)	S(ARB)	GCV(ADB)			
	14.5	2.0	42.2	40.90	0.10	5728			

Raw materials sources

Iron ore Slurry

Main raw material for iron ore Pelletisation i.e., Iron ore fines/Concentrate is received in the form of slurry (~69% solids) at pellet Plant through slurry pipeline from Kirandul Beneficiation Plant.

Bentonite

The Bentonite requirement of the plant is sourced from private mines in Gujarat state through purchase. The quality of Bentonite envisaged chemical composition is already given above.

Anthracite Coal

The required size of Anthracite coal is minus 6 mm and is sourced from Russia through purchase from Ukraine/Russia and will be transported through sea route.

Limestone

The Limestone suitable for pellet plant is sourced from Dubai region and is transported by sea route to Visakhapatnam Port Trust.

Operating Regime

The plant is operating based on three shifts a day continuously. The plant availability is as follows.

Description	**Duration in days/year**	**Frequency**
Major capital repairs	15	Once in a year
Scheduled maintenance	Continuous	2 shutdowns of 12 hours each in a month
Unscheduled stoppage and shutdown	1-2	Once in 2-3 months
Total non-productive days	10	--
Total productive / working days	350	--

For all practical purposes number of working days of the plant has been assumed to be 350 days

Material Balance:

INPUT Dry basis				**OUTPUT Dry basis**			
Material	**%**	**t/h**	**t/yr.**	**Material**	**%**	**t/h**	**t/yr.**
Iron ore Concentrate	96	962	81,96,240	Pellets	96	962	8166240

A. Coal	1.4	13.62	1,16,042.4	Loss on ignition	4	38.63	329127.6
Limestone	1.6	15.39	1,31,122.8	----	----	----	----
Bentonite	1.0	9.62	81,962.40	----	----	----	----
Total	**100.00**		**81,96,240**				

Quality of Pellets

The chemical composition of DR grade pellets is shown in below.

Constituents	Value
Fe (t) (%)	65.3 - 65.5
SiO2 (%)	3.42
Al_2O_3 (%)	1.55
CaO	0.90
MgO	0.15

The mechanical and metallurgical properties of the pellets are depending on the physical characteristics and chemical composition of the input raw materials.

Based on the experience with respect to Indian iron ore Concentrate and other materials following mechanical and metallurgical properties of the pellets can be anticipated.

Description	Value
1. Size of pellets	
9 to 16 mm	95.50
Plus 16 mm	2.50
Minus 9 mm	2.5-3.0
Porosity	25.60
Cold Crushing Strength	260
tumble index (plus 6.35 mm)	93.5
Abrasion index (minus 0.6 mm)	5.4

Specific consumption of Raw materials and Services

Raw materials specific consumption (dry and net), kg/t of pellets

Raw Materials	DR Grade Pellet
Iron Ore Concentrate	1.03
Limestone	16 kg/t
Bentonite	10 kg/t
Anthracite Coal (for Pellet plant)	14.10 kg/t
Fuel oil	14.5 -15 l/t
Steam Coal Specific Coal Consumption (gross) @4700 GAR (for CPP)	1.03-1.04
Natural Gas	20.07m^3/t

Services specific consumption per ton of pellets

Description	Specific	Unit
Fuel Oil	14.5-15.0	Litres/ton
Water (pellet plants)	0.4-0.5	M^3/ton
Power (Pellet Plant)	39.0-40.0	kwh/MT

Services specific consumption in CPP

Description	Specific	Unit
Water (CPP)	4.0-4.5	M^3/HR/MW
Steam Coal Specific Coal Consumption.(gross) @4700 GAR (for CPP)	1.03-1.04	Specific

Process Description Pellet Plant

The main plant facilities include the concentrate Slurry receipt in Slurry tanks, filtration, additives grinding, balling, induration, and product load out besides the auxiliary and service facilities. These facilities have been described in the subsequent sections.

Slurry Receipt & Filtration: The slurry received from Kirandul is stored in the four slurry tanks; there are two Slurry tanks for each line. Each tank is 20m dia. and 18m height. An independent slurry pump house for each pellet plant is established near the

tanks. There are 04 slurry pumps of adequate capacity to pump slurry to Filtration building.

Filtration: There are 04 Nos. of pressure filters, 10 nos. ceramic filters and 4 nos. Vacuum filters are in existing filtration building. Each filter has about 144 m2 filtration area. Dedicated compressors and wash pumps are installed in the filtration area of the plant to provide the air volumes and pressures necessary for the filters. Each filter has its own hydraulic pump and drive. Cycles are controlled and programmable. From all the filtering sections from both the plant, separated filtrate water is sent to thickeners (2nos) one for each plant. The filter cake produced from these filters will cme out with a moisture content of approx. 9 to 9.5%.

Grinding of Anthracite coal & Limestone and Bentonite and Handling: A primary crusher for limestone is provided to bring down the size from approx. +50mm to -6mm to improve the throughput of ball mill envisaged for grinding of anthracite coal and Limestone/dolomite together. Bentonite will be ground in a Ring Roller mill. Hot air generator shall be provided for facilitating dry grinding. Anthracite coal and limestone are drawn from the bins in additive grinding unit in required proportion and fed to the ball mill for grinding. A hot gas generator using fuel oil (LDO) is attached to the ball mill to dry the additives. The ground anthracite coal /limestone mix is either sent to the day bins in the mixing area or sent to the storage silo. Transportation of ground products is carried out pneumatically.

The grinding system for Bentonite consists of Ring roller mill having a capacity of 30 TPH. It is equipped with a hot gas generator using fuel oil (LDO) for the simultaneous drying of the ground product, bag filter and fan. A net operation time of approx. 8 hours per day for Bentonite is required to cover the daily demands. Ground products are stored in silos and transported pneumatically to Bin/Mixing building.

Mixing of Filter cake and Additives: The filter cake from the pressure filters is collected on a belt conveyor and fed into 2nos intermediate bins (effective volume approx. 450 m3 each). In this section bin for ground Limestone + dolomite (effective volume 100m3) and the other for Bentonite (effective volume 75m3) are also provided. Proportioning of Bentonite to the required quantity of filter cake according to a pre-selected value is performed by weigh feeders which are installed underneath the bins for filter cake, Limestone + Anthracite coal and Bentonite. Filter cake, Anthracite coal mix and Bentonite are mixed in EIRICH mixer, enabling an intensive mixing of above materials.

Balling: The mixed material is conveyed and distributed to mixed material bins installed. The charging of these bins is done automatically in accordance with a pre-set time schedule. A control loop, governed by the filling degree of the bins, is superimposed on this schedule for determining the direction of feed. This bin's filling degree is measured by load cells. The material discharge from each mixed material bin is affected by a vibrating mouth and controlled by a weigh feeder which is equipped with a variable speed drive, thus feeding the adjusted amount of mixed material onto the pelletizing discs. Each

balling disc with 7.5 m diameter is charged by means of a fluffer. The fluffer has two functions, namely the disintegration of any compacted material as well as the distribution of the mixed material on the balling disc. Green pellets are formed on the disc, with simultaneous and variable addition of water. The inclination and the RPM of the discs are variable. Optimum inclination is determined during start-up, according to mixed material properties, desired green pellet diameter and feed rate. During operation it is possible to regulate the disc RPM. Green pellets exiting each disc are transported by a short belt conveyor to a roller screen for removal and recycle of both oversize and undersize green balls, lumps, and fines.

The On-Size green pellets from roller screen are discharged onto a reversible belt conveyor. In case of emergency and during start-up of a disc when the green pellets do not possess the required properties, the disc discharge can be recycled or discharged to an emergency stockpile. During normal operation, the reversible belt conveyor transfers the green pellets to the wide belt conveyor. This flat belt conveyor ensures smooth handling of the green pellets. A weigher is installed in this belt for weighing the total amount of green pellets discharged from the pelletization discs, which is one of the parameters for the Indurating machine speed control.

For distributing the narrow stream of green pellets smoothly and evenly onto the 4 m wide Indurating machine, a reciprocating conveyor will be installed which feeds the green pellets uniformly onto a 4 m wide belt conveyor. This wide belt conveyor discharges the green pellets onto a double deck roller feeder which consists of an upper and a lower roller deck. The upper part screens out oversize green pellets (i.e., + 18 mm) and the lower part will screen out undersize green pellets (i.e., - 8 mm). Besides this, a certain rerolling effect of the green pellets is achieved during screening process.

Induration: The green pellets will be indurated on a travelling grate induration furnace. This travelling grate consists of an endless chain of pellets which continuously move on tracks. One of the process pre-requisites for obtaining a uniform product quality is a uniform bed height which is ensured by automatic control of the travelling grate speed as a function of the green pellet feed rate. The pellets and grate bars are of special and well proven design for the induration process thus enabling long service life with low maintenance. To avoid thermal shock to grate bars and pellets, green pellets are charged over a layer of indurated pellets. pellet sides are also provided with the indurated pellets. Side layer is used for protecting the side walls of the pellets and for avoiding the so called "side wall effect". A storage bin for hearth and side layer is provided at the feed end of the travelling grate. The height of the hearth layer is adjusted by a motor driven discharge gate.

The hearth and side layer bin are equipped with an emergency chute which permits additional filling of pellets with hearth layer in case of failure in the green pellet feeding system and thus protecting the pellets and grate bars from overheating. The complete pellet Indurating process takes place in the following zones, through which the pellets are conveyed.

After firing Following drying of green pellets in the up draught and downdraught drying zones, the dried pellets will be preheated to a progressively higher temperature to initiate Sulphur burning due to anthracite coal present in the mix. The pellets will then be fired at approx. 1300°C - 1350°C to provide the recrystallization and slag bonding which will impart adequate strength to the pellets. An unfired short section designated as 'after firing' allows the heat front to completely penetrate into the bottom of the bed thereby eliminating sudden quenching of pellets and consequent deterioration of properties. Cooling of indurate pellets will be accomplished by up draught ambient air through the pellet bed supplied by a cooling air fan.

The cooled pellets will leave the Indurating machine at 100°C or less.

Brief description - process gas flow

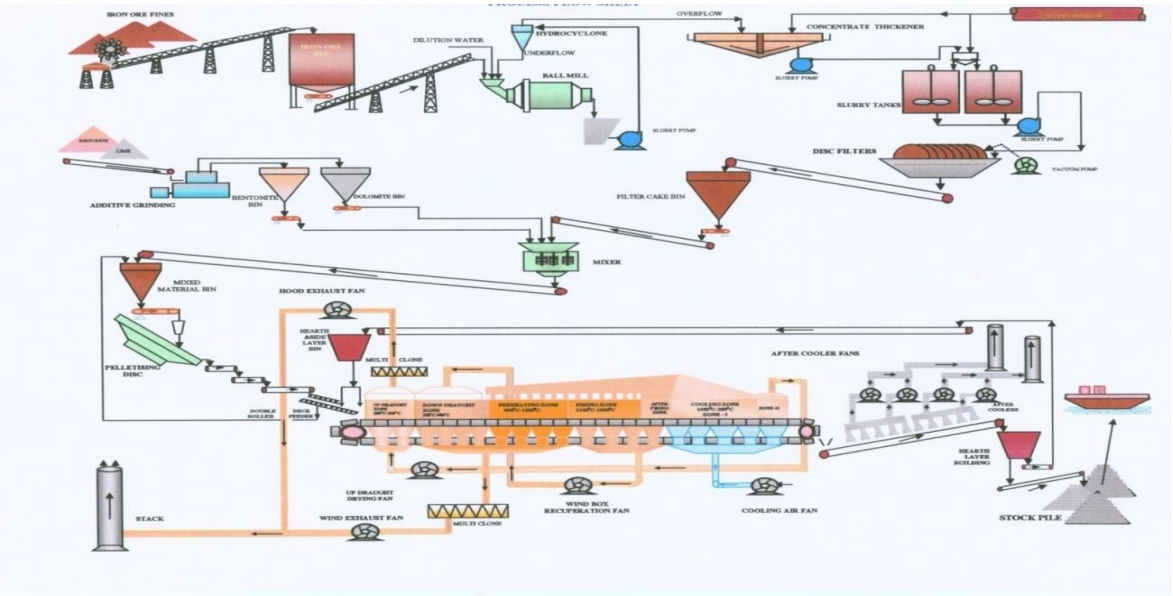
Hot combustion gases enter the firing zone by the direct recuperation principle, which means, that hot gases from the cooling zone no. 1 are recuperated. Burners are arranged opposite to each other on the longitudinal sides of the preheating and firing zone. The arrangement and sizing of the burners ensures a uniform hot gas temperature over the width of the pellet bed. Since the burners are divided in several control zones an optimum temperature profile can be adjusted thus permitting an optimum heat treatment of the pellets. The fuel is atomized by means of pressurized air. Preheating of fuel is achieved by means of electric preheater. The temperature values in the individual control zones of the preheating and firing zone are measured with thermocouples and indicated by the central control system, they serve as control variables for the automatic supply of fuel or gas to the burners. Intake and circulation of the air and gas required for the process is ensured by the application of various fans. The induration process is characterized by the recovery of maximum heat from cooling of the hot pellets by applying the direct recuperation principle which means transportation of recovered hot air from the first cooling zone to the preheating and firing zone without a fan. The cooling air fan sucks in ambient air through a silencer and forces this air through an air duct into the wind boxes of cooling zone no. 1 and no. 2. The cooling air, which picks up heat from the hot pellets, is collected in the first and second cooling hood. These hoods are installed directly above and sealed against the travelling grate. The heated air is recycled to the process as a "heat carrier". The hot air collected in the second cooling hood is extracted by the up draught drying fan and forced through a duct into the wind boxes of the up draught drying zone. In order to stabilize the temperature of this air for optimum green pellet drying, ambient air may be sucked in ahead of the up draught-drying fan through a bleed-in. Excess air which is not required for up draught drying and which would lead to excessive pressures in the wind boxes of the up draught drying-zone is bypassed via a bleed-off gas duct.

The hot combustion gases of the downdraught drying, preheating, and firing zones are sucked in "Downdraught" through the pellet charge by fans. The wind boxes of the downdraught drying zone and the preheating zone are all connected to the wind box exhaust fan. These wind boxes are connected to Electro Static Precipitators (ESP) for

de-dusting the dust laden waste gases. The wind box exhaust fan discharges the waste gases to atmosphere via the waste gas stack. The hot combustion gases of the firing and partly of the after firing zone serve as drying gases in the down draught drying and part of the preheating zone. They are sucked off through the pellet charge by the wind box recuperation fan and then forced via gas ducts into the hood above the downdraught drying and preheating zone. The gas duct connected to the preheating zone is equipped with a special gas burner to increase the temperature for the preheating zone, if required.

In order to maintain a constant and optimum temperature of the drying gases and to protect the wind box recuperation fan from overheating, bleed-in for ambient air, with control dampers, are provided at the suction side of the wind box recuperation fan. A bleed-off gas duct is installed on the pressure side of the wind box recuperation fan, to bleed-of excess drying gases to the Up draught drying fan. The hood exhaust fan sucks off the humid exhaust air from the up draught-drying hood. Hot excess gas from the recuperation fan is added, in order to raise the temperature of this air.. The exhaust gas is directed to atmosphere via the waste gas stack. A grate bar cleaning device is located near the lowering station on the return track of the travelling grate.

Pellet Product Stockpile and Reclamation: The pellet product conveyors will discharge the fired pellets into the product load out system. The pellets will be transferred through a system of conveyors to a travelling boom stacker (2 nos.). The pellet stacker will be mechanized and mounted on a rail track, sewing and luffing movements are provided in the stacker boom conveyor to facilitate "wind row" type stacking of pellets. Windrow stacking is required to overcome the natural tenancy for pellets stacked in the Chevron mode to classify in the stockpile. To ensure the maximum possible blending of pellet product, the stacker will travel continuously over the total length of the stockpile. An emergency loads out system is provided at the hearth layer separation bin to facilitate operation.



Plant De-Dusting Systems: The ambient atmosphere in the pellet plant is kept at low-dust level in order to maintain clean workplace conditions as well as facilitating plant maintenance. All dust-creating areas within the pellet plant are covered with hoods or casings and connected to the room de-dusting systems. The dust content of the waste gases is collected by two ESP's, installed in wind box exhaust and the hood exhaust . The dust in the form of slurry is fed into a small agitator tank from where it is pumped to the thickener. At the discharge end of the travelling grate, a wet scrubber is installed for dedusting the travelling grate feed and discharge area, the product transfer points and the screening area.

Control Room: The filtering and pelletizing plant is controlled and operated from a central control room. All required plant information is indicated / recorded. Switches for starting and stopping of the plant equipment are positioned on a control desk. The instrumentation system requirement comprises an operator system, which consists of color monitors, keyboards, or light pens giving access to all signals of the filtering and pelletizing plant.

Captive Power Plant:

Raw Materials: - Main Raw material used in CPP is Steam coal from Indonesia.

Steam Coal (for CPP)	1,77,500	Indonesia	2240	Sea route	Visakhapatnam

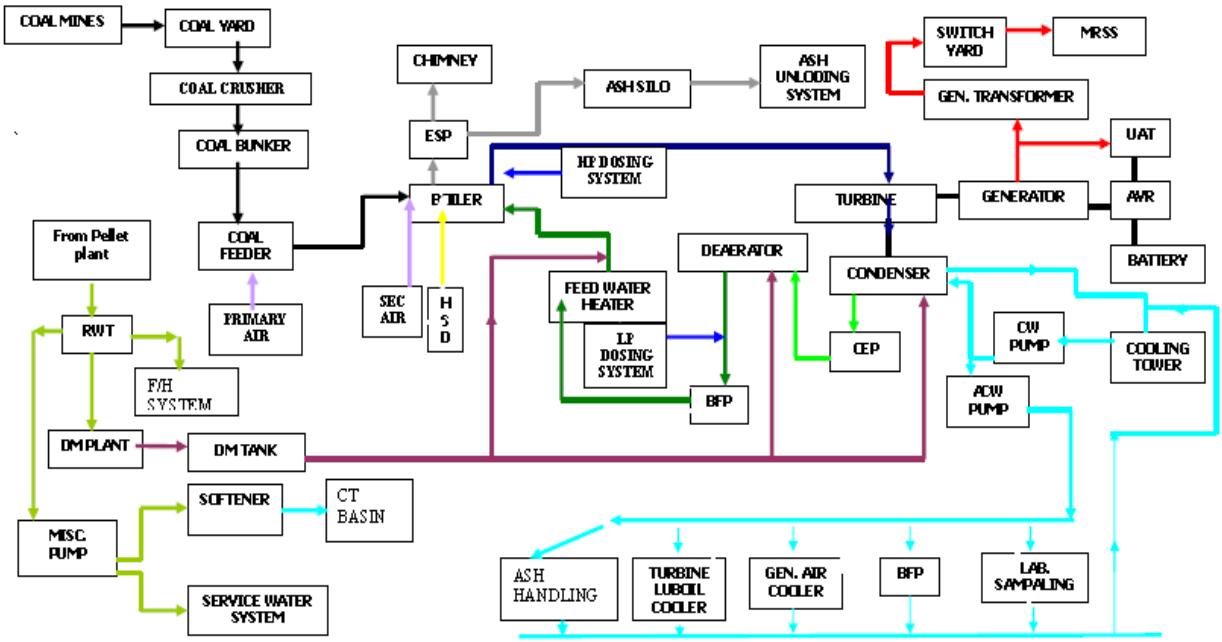
Average chemical composition of Steam Coal (for CPP)

Moisture (ADB)	Ash (ARB)	VM (ADB)	FC (ADB)	S(ARB)	GCV(ADB)
14.5	2.0	42.2	40.90	0.10	5728

Process Description: -

AFBC boiler is a very developing technology now these days this technology is widely used in the industrial boiler for the purpose of efficient and clean burning of coal and other fuel for steam generation. AFBC boiler is suitable for combustion of low quality fuel. In AFBC boiler fluidization bed combustion is method of burning of solids fuel in which the fuel is continuous fed into hot fluidized bed of inert bed material. Inert fluidized bed is heated to the ignition temperature of fuel and fuel is supplied continuously into the bed. The fuel burn rapidly and the bed attain a uniform temperature. In AFBC boiler combustion is take place at about 850- 950 degree Celsius.

CPP PROCESS FLOW CHART



3.7 Resources optimization/ recycling and reuse envisaged in the project, if any, should be briefly outlined

The Raw Material Handling Section is provided with dust suppression system (DS) such as water sprinkling at the stockyard and multiple dust extraction (DE) systems for the dust generation points at the screen, conveyor transfer point and gas sealing devices to arrest the dust emissions to the atmosphere. The DE system shall consist of bag filter units complete with ducts, extraction fans and stack of appropriate height.

The exhausted gases sucked through Pellet plant are cleaned in a ESP. The dust collected is discharged into a water sealed scraper and sent to primary mixing unit for re circulation. Waste gases is discharged into atmosphere through a chimney.

Wet process of Iron ore grinding is adopted, and entire process water get recycled. Surplus water from slurry pipeline is being reused in Pellet Plant. Installation of water sumps and sump pumps at strategic locations for re utilization of wastewater have been done. Provision of thickener is there to clarify the process water.

3.8 Availability of Water Its Source, Energy/Power Requirement and Source

3.8.1 Water requirement

Table 3.1

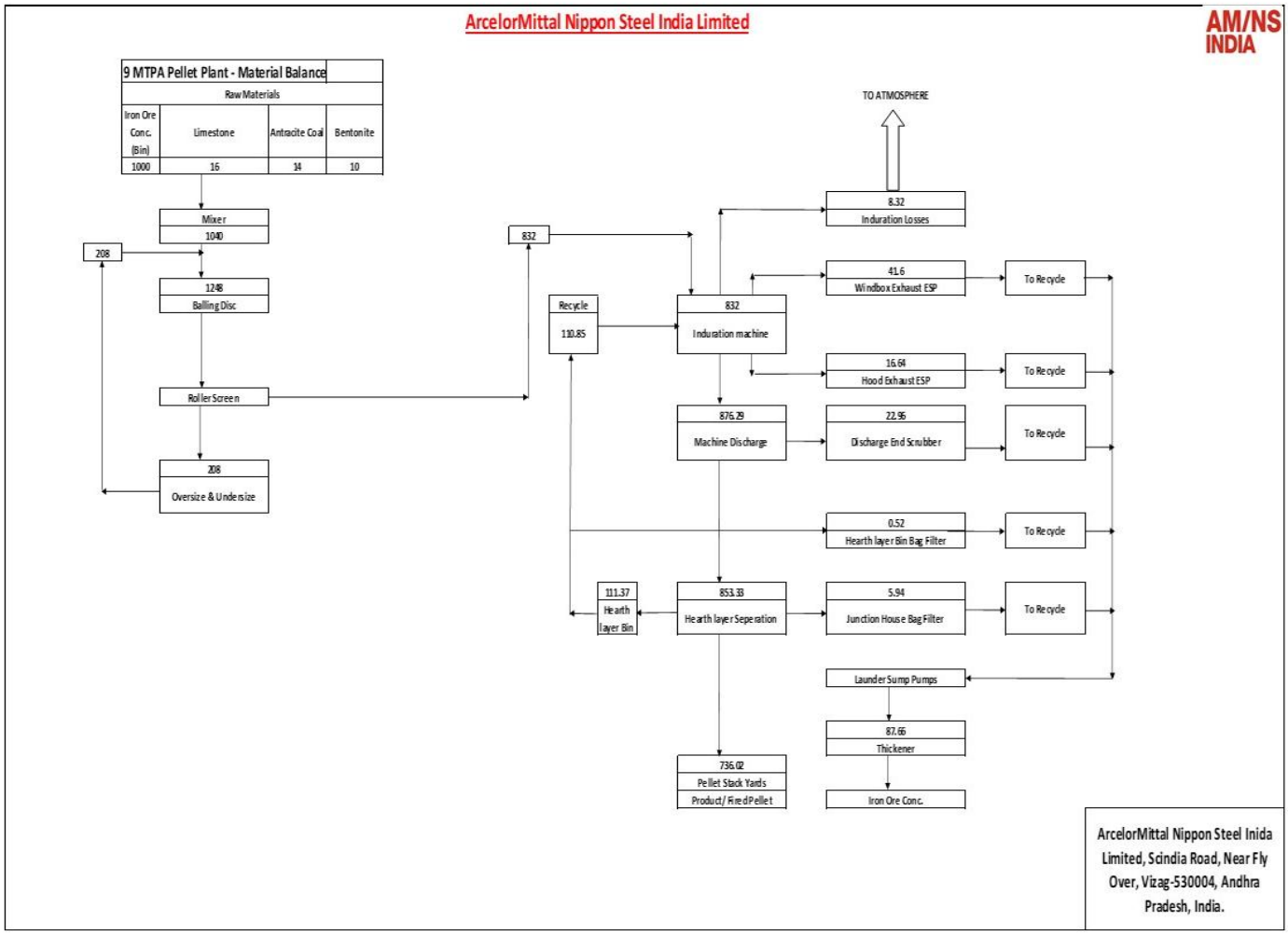
S.No	Purpose	PP-1	PP-2	CPP	Total
1	Process	2500KLD	2500KLD	--	5000KLD
2	Cooling (Makeup)	600KLD	600KLD	3655KLD	4800KLD
3	Gardening	330KLD	--	--	330KLD
4	Boiler feed	--	--	50KLD	50KLD
5	Domestic	10KLD	10KLD	5KLD	25KLD
	Total	**3440KLD**	**3110KLD**	**3655KLD**	**10205KLD**

3.8.2 Water Sources:

Table 3.2

S No.	Source	KLD
1	From Slurry Pipeline	9120
2	From GMVC Water supply	1200
	Total	**10320**

Material Balance:-



3.8.3 Power Requirement

Total power requirement for existing and proposed Pellet Plant is 40 MW which is obtained from the Captive Power Plant of 25 MW.

Power requirement of remaining 15 MW is sourced from APEDCL grid supply.

3.9 Quantity of wastes to be generated and scheme for their management/disposal:

3.9.1 Waste water Generation from Industrial Use:

Wastewater Generation For existing Pellet Plant & Power Plant	
Type	**Qty. in m^3/hr**
Water from de dusting systems	30
Floor washings Etc	15
Disposal	Wastewater is being re-used back in Process

Surface Runoff Treatment:

The Surface run off flows down slopes as run off towards the sump which will be further treated by thickener and put to reuse back into the process.

3.9.2 Solid Waste Management

Pellet Plant

- Zero discharge concept is adopted by recycling all the solid waste generated in which thickener is a vital equipment.
- Dust is generated from Electrostatic precipitator (ESP), wet scrubber and bag filter are converted into slurry and put back into the process thickener for reutilization.
- **CPP**: Fly ash generated of about 15 tons per day which is stored in silo and disposed off to brick manufacturer. Low sulfur, low ash Indonesian coal of less than 3% ash content is used.

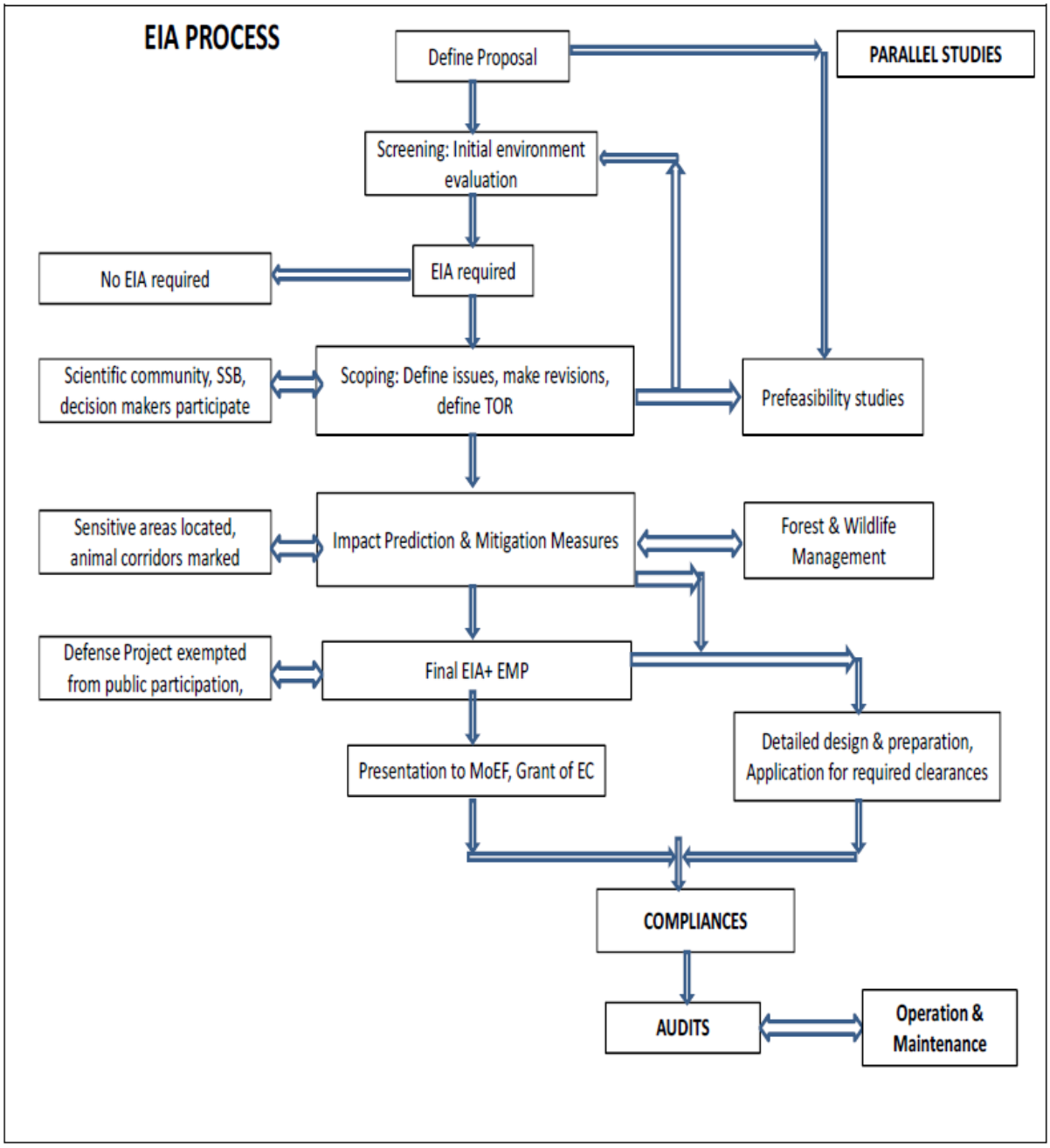
Effective management of Hazardous waste:

Hazardous wastes are wastes with properties that make them dangerous or potentially harmful to human health or the environment. Hazardous wastes can be liquids, solids, contained gases, or sludge. Hazardous Waste authorization number by SPCB, Andhra Pradesh APPCB/VSP/111/CFO/HO/2019- dated 04/10/2019 and is valid up to 31/12/2024.

Used/Waste Lubricating Oil/Hydraulic oils/Greases: 24 KL/ year Used Oil from DG sets is carefully stored in High Density Polythene (HDPE) or MS drums in isolated covered and non-permeable flooring facility. This used oil is sold to vendors authorized by State Pollution Control Board/ MoEF&CC.

As per the direction, 3rd Party Hazardous Waste Audit is being conducted every year and the report is being submitted to APPCB, Andhra Pradesh before 30th June of every year.

3.10 Schematic representations of the feasibility drawing



4. Site Analysis

4.1 Connectivity

The land is located at: Scindia Road, Near Flyover, Visakhapatnam, Andhra Pradesh state.

Access:

- The site is well connected with road, NH- 5A (at a distance of 1.3 km in North direction), SH- 157 (at a distance of 7 km in West direction), SH- 39 (at a distance of 0.8 km in West direction).
- Vizag Railway Station is at a distance of 1.4 km in East direction.
- Visakhapatnam Airport is approximately 2.2 km from the plant site.

4.2 Land form, Land use and Land ownership

The plant has a land area of 44.5154 ha (110Acres).The area consists of office building, pellet plant-1, pellet plant-2, thickener unit, man water reservoir, pressure filter building, central stores, filter cake stockpiles, captive power plant. Plant construction works completed in 1996 and 2005.Plant consisting of office building, Pellet Plant 1, Pellet Plant 2, Thickener, Main water reservoir, Pressure filter building, Central stores, Filter cake stockpiles, Captive Power plant etc. Construction of PP-1 started in 1996 and commissioned in 1996 and PP-2 construction started in 2000 and commissioned in 2005, Captive Power plant started in 2003 and commissioned in 2005. Some small construction works like providing Pipe line civil pedestals, Shed with walls construction for Natural gas Pressure reduction Station (PRS) station (12x8mts size) inside the plant.

The detail land use breakup for the existing and proposed plant has been given in table below:

Table 4.2(a)

Sl No	Particulars	Total Area (Acres)	Percentage (%) of Total
1	Pellet Plant—I	0.957	0.870
2	Pellet Plant—II	1.069	0.971
3	Power Plant	4.35	3.950

Sl No	Particulars	Total Area (Acres)	Percentage (%) of Total
4	Road & Drainage	10.53	9.572
5	Building	21.81	21.645
6	Green Belt	48.95	46.485
7	Solid waste storage	2.5	2.272
8	Solid waste area	1.2	1.090
9	Water storage area	5.468	4.970
10	Raw material storage area	3.3	3.00
11	Coal product storage area	5.682	5.165
12	Finished product storage area	4.164	3.79
	Total	**110.00**	**100**

Stock Pile Area of 18.25 ha (outside the plant) consists of stockpile, Conveyers Green Belt Buildings Stacks. The area breakup of 18.25 ha is given below:

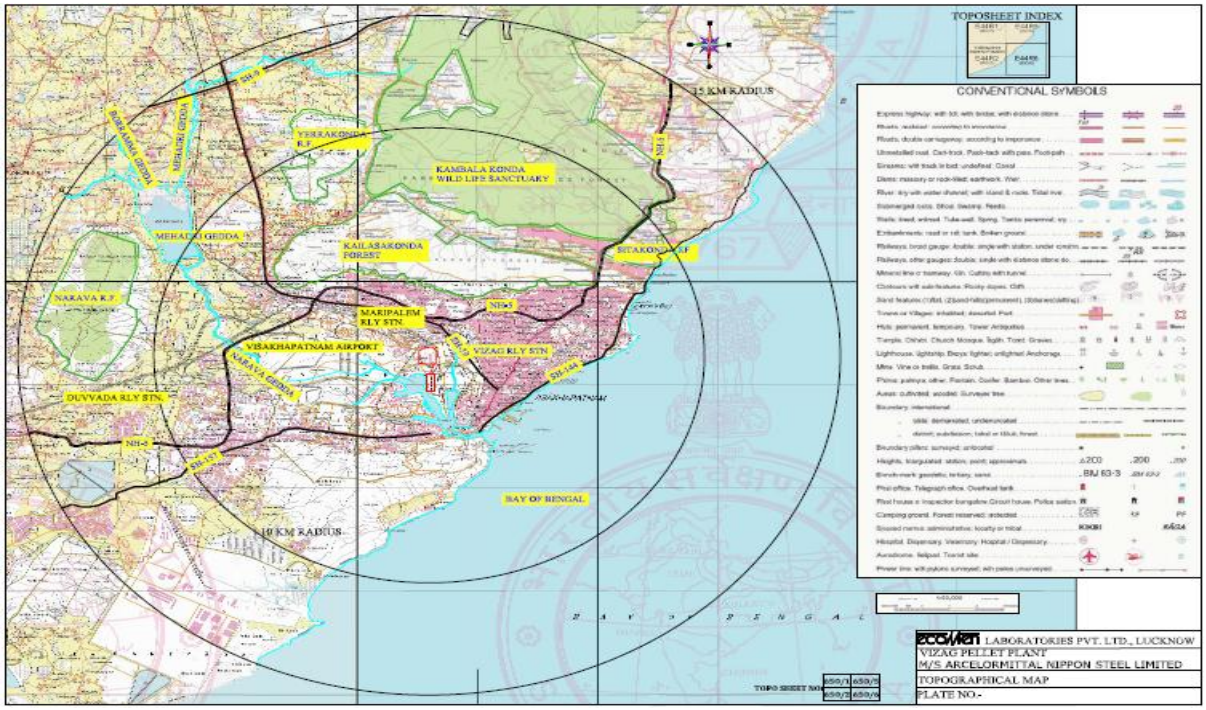
Table 4.2(b)

Sl No	Particulars	Total Area (Acres)	Percentage (%) of Total
1.	Conveyers	12.96	28.73
2.	Green Belt	0.295	0.654

3.	Buildings	0.12	0.266
4.	Stacks	31.725	70.34
	Total	**45.10**	**100**

4.3 Topography

The land is of nearly flat and has little undulation in some directions. The topographical map is given below: -



4.4 Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ), shortest distances from the periphery of the project to periphery of the forests, national park, wild life sanctuary, eco sensitive areas, water bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.

The existing land is of mixed land use. The eastern and Western side of the plant is mainly crop land and fallow land. The Bay of Bengal is in south east side.

Table 4.4: Existing Land Details

S. No.	Particulars	Details (with approx. aerial distance & direction from the project site)
1	Nearest City	Visakhapatnam

S. No.	Particulars	Details (with approx. aerial distance & direction from the project site)
2	Nearest National Highway / State Highway	SH-39 (0.8 km)
3	Nearest Railway station	Vizag Railway Station (1.4km)
4	Nearest Airport	Visakhapatnam Airport (2.2km)
5	National Parks, Wildlife Sanctuaries, Biosphere Reserves, Reserve forest and Protected forest within 10 km Radius	Kailasa konda Forest, (2.5 km) Kambala konda wildlife sanctuary, (6.0 km) Yerra konda Rain Forest, (7.9km) Narrava Rain Forest(10.5km) Sitakonda Rain Forest (8.1km)
6	Water Body	Bay of Bengal, (3.3 km) Narrava Gedda (5.3 Km) Mehadri Gedda, (9.2 km) Madri Gedda(14.5 km)
7	Defense installations	Yes INS Satvahana (2.71KM) Indian Coast Guard Jetty (1.94 KM) Naval Air Force Station (4.76 KM)
8	Seismic Zone	IV

The 10km radius area have following land use as given below:-

S. No	Category	Area in Ha	% of the Study Area
1	Dense Forest	5927.91	18.67
2	Built Up Land	12770.59	40.23
3	Plantation	4962.62	15.63
4	Water bodies	8082.57	25.46
	TOTAL	**31743.69**	**100**

4.5 Existing Infrastructure

The existing physical infrastructure is sufficient to run the 8.16 MTPA pellet plant. The site has Filtration building, bin mix building, balling building, Induration building,

Additive grinding building, Additive storage and Grinding building, Cooling tower, Stockpile and Product conveyor etc. The existing infrastructures like Slurry pipeline, Raw material storage yard, finished products storage yard, FO unloading point, FO/LDO storage facility, Additive grinding building, Thickener, Filtration unit and Slurry tank etc. will be used for the expansion as the common facilities.

4.6 Soil Classification

The district holds mainly three types of soil: Laterite, Deep Alluvial soils and Coastal saline soils. Deep Alluvial soils and Coastal saline soils cover major parts of the district. Alluvial soils are suitable for cultivation of paddy and other crops.

4.7 Climatic Data from Secondary Sources

Visakhapatnam has a tropical wet and dry climate (Koppen Aw). The manual mean temperatures ranges between 24.7-30.6°c (76-87°F), with the maximum in the month of May and minimum in January; the minimum temperatures ranges between 20-27°c (68-81°F). The highest maximum temperature ever recorded was 42.0°c in 1978, and the lowest was 20.0°c (68°F) in 1904. It receives rainfall from the southwest and North-east monsoons and the average annual rainfall recorded is 1,118.8 mm (44.05 in).

4.8 Social Infrastructure Available

Vizag city is near to the plant site. All amenities including school, college, Hospital, Temples are available within 10 km from plant site. Almost all the area in the buffer zone are electrified. Under the Corporate Social Responsibilities, development of the nearby villages is being undertaken.

5. Planning Brief

5.1 Planning Concept (type of industries, facilities, transportation etc) Town and country planning / development authority classification

The plant is existing since 1996. All facilities are in place. It is proposed to switch over to a more environment friendly fuel Natural gas from the LSHS, However LSHS will be kept as standby fuel.

5.2 Population Projection

As it is an operating project there will not be any change in the population due to this project in future.

5.3 Land Use Planning (breakup along with green belt)

The total land of 110acres leased from the Visakhapatnam Port Trust (VPT) has been utilized as per the following breakup:

Sl No	Particulars	Total Area (Acres)	Percentage (%) of Total
1	Pellet Plant—I	0.957	0.870
2	Pellet Plant—II	1.069	0.971
3	Power Plant	4.35	3.950
4	Road & Drainage	10.53	9.572
5	Building	21.81	21.645
6	Green Belt	48.95	46.485
7	Solid waste storage	2.5	2.272
8	Solid waste area	1.2	1.090

Sl No	Particulars	Total Area (Acres)	Percentage (%) of Total
9	Water storage area	5.468	4.970
10	Raw material storage area	3.3	3.00
11	Coal product storage area	5.682	5.165
12	Finished product storage area	4.164	3.79
	Total	**110.00**	**100**

In addition to the above further 45.10 acres outside the plant area is used for Stockpile.

5.4 Assessment of Infrastructure Demand

There is not going to be any change in the infrastructure demand as it is an existing project. Only a pipe line of 1.9 km will be used inside the plant for transporting the natural gas from the GAIL pipeline

5.5 Amenities/Facilities

The plant is in operation since 1996. All the necessary facilities for staff welfare are in place

The necessary utilities and other amenities as required for the smooth operation of the plant are in place.

6. Proposed Infrastructure

6.1 Industrial Area

The plant has a land area of 44.5154 ha (110Acres). The area consists of office building, pellet plant-1, pellet plant-2, thickener unit, man water reservoir, pressure filter building, central stores, filter cake stockpiles, captive power plant. Besides the above, further 18.25 ha of leased land are available as stock pile the product. A 1.9 km pipeline is proposed to deliver the natural gas at the usage point.

6.2 Residential Area (Non-processing area)

There is no residential area (Non processing area) within the project area neither it is proposed.

6.3 Green Belt

A well-developed green belt is in place within the plant area. A total number of 48.95 acre out of 110acre (44.5%) is covered under plantation with 49537 number of trees. The details are given below and shown in the layout plan.

Location of Green Belt / Plantation	Approx. Area covered in Acres	Number of Trees existing
Surrounding admin building	6.54	6618
Opposite to plant -port main road, towards plant boundary	7.23	7317
MRSS surroundings	3.25	3289
JH-8 HLSB, product conveyors	1.65	1670
East side boundary	8.67	8774
Thickener back side	1.17	1184

Location of Green Belt / Plantation	Approx. Area covered in Acres	Number of Trees existing
Water reservoir to scrap yard	13.79	13955
CPP coal yard surroundings	0.93	941
Main Water pump house	1.49	1508
Stores & Cafeteria	1.01	1022
South Side boundary	1.83	1852
Pellet plant surroundings	1.39	1407
Total	**48.95**	**49537**

6.4 Social Infrastructure

The project is located in the leased area of Visakhapatnam and is meant for industries. There are however Hospitals, Schools, colleges, parks, banks etc., in Visakhapatnam which is 2.0 km from the project and is the District Headquarters. Moreover, the village in the surrounding for lease area of the Social Infrastructure that is normally required for Good living.

6.5 Connectivity

Visakhapatnam from being just 2.0 km from the project; the project is well connected via the road, rail and via connectivity.

6.6 Drinking water management (source & supply of water)

Drinking water is arranged by the project through the GVMC supply

6.7 Sewage system

15 KLD of domestic waste water is generated which is disposed through septic tank and soak pit arrangement. However, the project proponent ha salready initiated process for installation of a STP of capacity 15 KLD.

6.8 Industrial waste management

The solid waste from various points such as the ESPs (for the de-dusting process) are collected and recycled back into the process.

Wet scrubber and bag filter converted into slurry, and transferred to the thickener for reutilization.

6.9 Solid waste Management

Pellet Plant

- Zero discharge concept is adopted by recycling all the solid waste generated in which thickener is a vital equipment.
- Dust is generated from Electrostatic precipitator (ESP), wet scrubber and bag filter are converted into slurry and put back into the process thickener for reutilization.
- **CPP**: Fly ash generated of about 15 tons per day which is stored in silo and disposed off to brick manufacturer. Low sulfur, low ash Indonesian coal of less than 3% ash content is used.

Effective management of Hazardous waste:

Hazardous wastes are wastes with properties that make them dangerous or potentially harmful to human health or the environment. Hazardous wastes can be liquids, solids, contained gases, or sludge. Hazardous Waste authorization number by SPCB, Andhra Pradesh APPCB/VSP/111/CFO/HO/2019- dated 04/10/2019 and is valid up to 31/12/2024.

Used/Waste Lubricating Oil/Hydraulic oils/Greases: 24 KL/ year Used Oil from DG sets is carefully stored in High Density Polythene (HDPE) or MS drums in isolated covered and non-permeable flooring facility. This used oil is sold to vendors authorized by State Pollution Control Board/ MoEF&CC.

As per the direction, 3rd Party Hazardous Waste Audit is being conducted every year and the report is being submitted to APPCB, Andhra Pradesh before 30th June of every year.

6.10 Power requirement & supply/source

The power requirement for the project is 40 MW and of which 25 MW is the captive Generation and 15 MW from the grid there won't be any addition power required for the proposed project via change in fuel from LSHS to Natural gas.

7. Rehabilitation and Resettlements (R & R) Plan

Since the project is in existence since 1996 and situated in the leased land from Visakhapatnam Port Trust especially developed for the purpose; Rehabilitation and Resettlement plan is not applicable.

Even for the proposed project via change in fuel from LSHS to Natural gas, the same is within the existing land area only.

8. Project Schedule & Cost Estimates

8.1 Likely date of start of construction and likely date of completion (Time schedule for the project should be given)

Action Plan switch over from LSHS/FO to Natural gas

S.No	Item	Total Cost INR
1	Design & Engineering Cost	50,00,000.00
2	Consultant fees	6,50,000.00
3	HAZOP & QRA studies by recognised agency	This is taken up By HSE
4	Burner supplies cost	17,00,00,000.00
5	Civil & Mechanical equipment cost	3,12,74,675.55
6	Construction cost	1,60,85,932.52
8	Taxes and Duties	4,01,41,909.26

Schedule for switching over fuel from LSHS/Furnace Oil to Natural Gas

Description	Schedule(Tentative)	Status
Availability of NG through pipeline for Industrial use	By July'22 (After EC)	NG Pipe line is being laid by GAIL/APGDC. Around 70km pipe line laid. Work is going on
Approval of project and fund	By Oct 20	Approved by ACC and fund is allocated.

allocation		
Floating of Inquiry	By Dec 21	RFQ plotted and offers received
Placement of order	By Dec 21	PO placed on M/S Hi-Mak.
Installation & Commissioning	By Oct 22	Works under progress.

8.2 Estimate project cost along with analysis in terms of economic viability of project

The project cost was 1307.98 Cr when it came into existence.

The project change is fuel from LSHS to Natural gas (with LSHS as backup fuel arrangement) costs Rs 48.2 crores

The project is in operation since 1996 and economically viable.

9. Analysis of Proposal (Final Recommendation)

9.1 Financial and social benefits with special emphasis on the benefits of the local people including tribal population if any, in the area

This is an existing project in operation since 1996. Pellets of this plant are being utilized mostly in the steel plant of ArcelorMittal Nippon Steel India Ltd through sea route at Hazira, Gujrat. The project is Economically viable. The project takes care of the local people in the area by contributing substantial amount for their benefit. The project has generated direct employment of 950 persons and many more indirectly. The summary of CSR expenditure made & proposed against CSR is given in the following table and details are discussed in the 'Additional Information' Section:-

S.No	Sector	Expenses made from 01.04.2017 to 31.03.2021	Proposed Budget for the year CY 22
1	Health	64,70,006	60,000
2	Education	9,06,850	90,300
3	Environment	12,20,802	4,35,000
4	Sports & culture	10,96,543	9,45,402
5	Infrastructure	8,30,195	23,69,300
Total		**10524396**	**39,00,002**

Additional Information

Environmental Management Plan

A comprehensive environmental management plan has been framed and implemented to keep the pollution levels within prescribed limits. The present pollution load is being observed between 35-45 mg/Nm^3 as against permitted load of 50 mg/Nm^3 as per CFO of APPCB. All the following measures will be practiced keeping the pollution levels low.

Sl no	Name of the Sampling location	Frequency of the Monitoring	Parameters
Continuous Ambient Air Quality Monitoring			
1	North East Corner	Hourly	PM10,PM2.5, So2 & Nox
2	South West Corner	Hourly	PM10,PM2.5, SO2 & NOx
Stack monitoring			
1	Attached to Indurating Furnace of Plant-1	Once in 15 days	Particulate Matter
2	Attached to Indurating Furnace of Plant-II	Once in 15 days	Particulate Matter
3	Attached to Additive Grinding of Plant-I	Once in 15 days	Particulate Matter
4	Attached to Discharge end of the Indurating Furnace of Plant-I	Once in 15 days	Particulate Matter
5	Attached to Hearth Layer Separation Bins of Plant-I & Plant-II	Once in 15 days	Particulate Matter
6	Attached to 125 TPH AFBC Boiler	Once in 15 days	Particulate Matter
Noise Level Monitoring			
1	All Four corners of the plant boundary	Once in a Quarter	Decibels

Water Sampling			
1	Main Water Reservoir water	Once in a month	
2	Process Water Reservoir	Once in a Month	
Soil Sampling			
1	All Four corners of the plant boundary	Once in a year	

Air Pollution Control Measures

Air pollution mitigation measures would be from the point and fugitive sources within the pellet plant. Presently, the air pollution mitigation measures guided by the Indian regulatory standards are mostly confined to the control of particulate dusts, SO2 and NOx, emissions of VOC, and other persistent organic pollutants (POPs) like dioxins, furans, etc., which occur in an integrated steel plant.

In view of this, the pollution mitigation measures from various shops as envisaged are given below:

- For existing 8.16 MTPA plant, main raw material iron ore fines are being transported through pipeline in form of slurry.
- For product transportation from plant to Vizag port is through closed overhead conveyor.

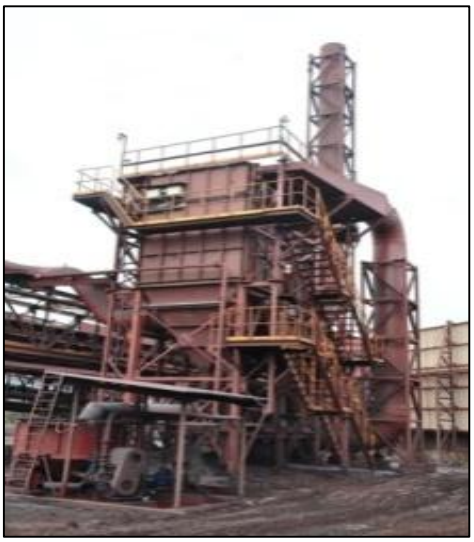
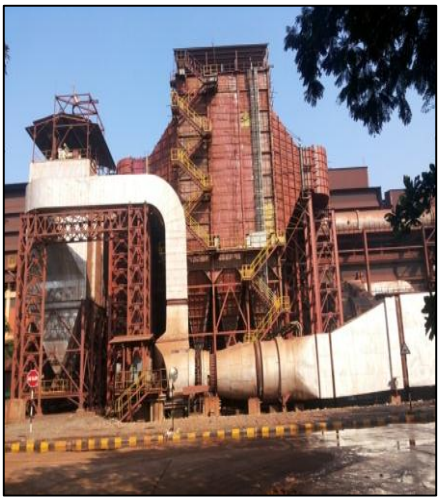
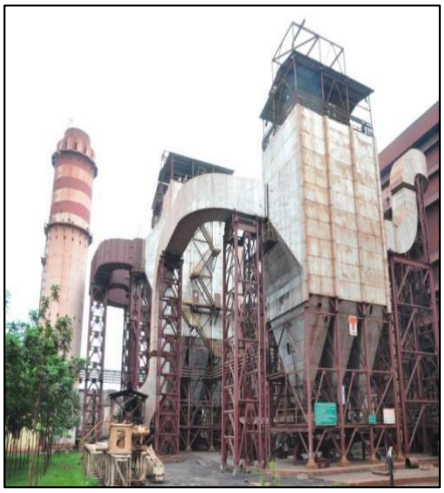
Because of these above-mentioned processes, the fugitive dust emission by the transportation of material by vehicles is reduced.

Existing Air Pollution control measures:

- Highly efficient electro static precipitator (ESP) has been installed in the induration Furnace.
- High-capacity wet scrubber and Bag filters have been provided at the below mentioned points for cleaning of exhaust gases.
- Location – 1: At the feed end of Induration machine
- Location – 2: At the discharge end of Induration machine
- Location –3: At the Hearth Layer Separation Building (HLSB)
- Dust collected at ESP, Bag filter, and scrubber are being recirculated into the process by wet disposal process into the process thickener.
- Installation of fixed type water sprinkling system along the internal roads and open raw material and product storage yard has been done.
- Covered storage area has been provided for storage of additives like Bentonite, limestone and coal.
- Dust Suppression System and Dry Fogging System are installed at all the junction houses.
- The clean gases are vented through the stack of adequate height.

Existing Stack Details with installed Air Pollution Control Equipment's

Stack No.	**Description of Stack**	**Stack height(m)**	**Quantity of emission (m^3 /hr.)**	**Prescribed standard (PM) in mg/Nm^3**	**APC installed**
1	Attached to Indurating Furnace of Plant-1	35	10,76,100	50	ESP
2	Attached to Indurating Furnace of Plant-II	35	10,76,100	50	ESP
3	Attached to Additive Grinding of Plant-I	30	34,200	100	Bag Filter
4	Attached to Discharge end of the Indurating Furnace of Plant-I	30	1,26,720	100	Bag Filter
5	Attached to Hearth Layer Separation Bins of Plant-I & Plant-II	25	41,600	100	Bag Filter
6	Attached to Discharge end of the Indurating Furnace of Plant-II	30	1,26,720	100	Bag Filter
Captive Power Plant					
7	Attached to 125 TPH AFBC Boiler	35	1,22,000	100	ESP

Pollution Control Equipment's	
	
Bag Filter	Wind Shield
	
Pellet Plant-2 ESP	Pellet Plant-1 ESP
	
Closed Conveyor	

RCC Internal Roads

Existing Pollution Control Equipment Details

Sl. No	Description	AREA	APC	Gas Volume	Dust Loads	
				Am^3/Hr	Inlet Gm/m^3	Outlet MG/m^3
1	Additive mill	AGB	Bag filter	29,500	20	50
4	JH-10 & AC1	AGB	Bag filter	7,500	20	50
5	Additive mill	CLG	Bag filter	36,500	20	50
8	HLSB	Pellet Plant -I	Bag filter	50,000	20	50
9	Mixer	Pellet Plant -I	Bag filter	5,500	20	50
10	Feed End top	Pellet Plant -I	Bag filter	16,500	20	50
11	Bentonite bin top F&B	Pellet Plant -I	Bag filter	9,000	20	50
12	Lime + coal bin top F&B	Pellet Plant -I	Bag filter	9,000	20	50
13	Discharge end Scrubber	Pellet Plant -I	Wet Scrubber	1,00,000	20	50
14	Fan 32 ESP	Pellet Plant -I	ESP	9,00,000	20	50
15	Fan 42 ESP	Pellet Plant -I	ESP	3,00,000	20	50
16	HLSB	Pellet Plant -II	Bag filter	50,000	20	50
17	Mixer	Pellet Plant -II	Bag filter	5,500	20	50
18	Feed End top	Pellet Plant -II	Bag filter	16,500	20	50
19	Bentonite bin top F&B	Pellet Plant -II	Bag filter	9,000	20	50
20	Lime + coal bin top F&B	Pellet Plant -II	Bag filter	9,000	20	50
21	Screening System HLSB	Pellet Plant -II	Bag filter	50,000	20	50
23	Discharge end Scrubber	Pellet Plant -II	Wet Scrubber	1,00,000	20	50
24	Fan 32 ESP	Pellet Plant -II	ESP	12,00,000	20	50
25	Fan 42 ESP	Pellet Plant -II	ESP	3,00,000	20	50
26	PP_II - JH-3	Stockpile	Bag filter	22,500	50	50
27	PP_I JH_3	Stockpile	Bag filter	30,000	20	50

Sl. No	Description	AREA	APC	Gas Volume	Dust Loads	
				Am^3/Hr	Inlet Gm/m^3	Outlet MG/m^3
Note: All the dust has been collected in the form of slurry from above mentioned APC are being used as raw material back into process, except additives material bag filters, where all the dust collected from additive are being used in dry form back into process.						

As described above, for the pellet plant all the above-mentioned control measures will be adopted for dust extraction and control.

- 2 nos. Continuous Ambient Air Quality Monitoring Stations (CAAQMS) are in place to monitor PM10, PM2.5, SO2, NOX.
- Continuous Emission Monitoring Station (CEMS) is also installed to 3 major stacks of Pellet plant-1 & pellet plant -2 and CPP and are connected to APPCB web site.
- Data is being transmitted to both State Pollution Control Board (SPCB) and Andhra Pradesh Pollution Control Board (APPCB) through Data Transmissions Unit (DTU) from all CAAQMS & CEMS stations.

Water Pollution Control

To minimize and control over the generation of wastewater, the existing plant is practicing namely,

i. Enhance the wastewater recycling to the extent practicable to conserve make-up water and

Water conservation measures

Existing water conservation measures and Quality management:

- Due to Wet process of Iron ore grinding, the entire water is recycled, so there is no generation of waste water.
- The treated water from slurry pipeline is being reused within the pellet plant.
- To reutilize the waste water, water sumps and sump pumps are installed at strategic locations.
- Thickener is used to clarify the process water.

Presently achieving Zero Discharge as described below:

Extreme care has been taken to ensure that no waste water is allowed to exit outside of the plant premises. Waste water generated is completely recycled back to the system from different sumps and siltation ponds. Necessary measures have been taken to manage the water released to outside from the storm water drain and if there is any overflow of water near raw water reservoir. Storm water drains are separated from process drains.

Noise Pollution Control

The overall aim towards control of noise pollution is not only to restrict the ambient and work zone noise within the specified norms but also to have minimum noise above the prevailing ambient noise levels in the vicinity of the pellet plant. Noise of rotary equipment will be kept low by suitable equipment design.

Work zone comfort

In addition to natural ventilation, selected areas like control rooms would be provided with air conditioning. Where ambient temperature is above 35°C, man coolers would be provided in selected areas of the shop floors. Mechanical sweeper/industrial vacuum cleaner, air circulator and water mopper would be used to keep the shop floor clean from settled dusts. In existing 8.16 MTPA Pellet Plant, the work zone comfort has been maintained by providing air conditioning to all major control room, laboratory and offices.

Waste Water generation & Management:

The units generate the wastewater and some amount of sewage is also generated. Both the waste water and domestic sewage suitably treated and reused/recycled in the different units, dust suppression and green belt area. The organization is following the zero-discharge concept and do not discharge wastewater outside the plant premises.

For the existing pellet plant, the waste water generated is completely recycled back to the thickener from different sumps and siltation ponds. Necessary measures have been taken to manage the water released to outside from the storm water drain and if there is any overflow of water near raw water reservoir.

Solid waste generation and Management:

- Zero discharge concept is adopted by recycling all the solid waste generated in which thickener is a vital equipment.
- All dust generated from ESP, Wet scrubber and bag filter are converted to slurry and put into the process thickener for reutilization which result in zero solid waste discharge.
- "Plastic Free Zone" concept is adopted inside the plant premise.

Effective management of Hazardous waste:

Hazardous wastes are wastes with properties that make them dangerous or potentially harmful to human health or the environment. Hazardous wastes can be liquids, solids, contained gases, or sludge. Hazardous Waste authorization number by SPCB, Andhra pradesh APPCB/VSP/111/CFO/HO/2019- dated 04/10/2019 and is valid up to 31/12/2024.As per the direction, 3rd Party Hazardous Waste Audit is being conducted every year and the report is being submitted to SPCB, Andhra Pradesh before 30th June of every year.

S. No	Category of Hazardous waste as per the Schedule I, II, III of the rules	Waste Description	Quantity	Mode of Disposal
1	Scheme-I Stream- 5.1	Used Oil	24.0 KL/A	Storage in containers over concrete floor under ventilated

2	Schedule- II Stream - 5.2	Waste/Residues containing oil	NIL	covered shed followed by sale to actual users having valid authorization from SPCB, Andhra Pradesh

AM/NS India VIZAG Sets Examples in Greenery and Eco System in Pellet Plant complex.

AM/NS India Vizag Pellet Complex Sets examples in all around Environmental Care and balancing the Eco System and Environment with regard to plant operations and green belt development. Essar Vizag has developed a unique greenbelt in and around its pellet complex and one of the major Corporate in demonstrating its commitment towards greenery this has been transformed an otherwise semi-arid and salinity in ground water conditions.

We are in an era of exponential changes in the Environment across the world facing challenges in the availability of resources for development, stringent environmental statutory norms, and increased ambient dust levels coupled with variety of toxic materials, climate change, and the impacts of all of these forces on human and natural systems.

AM/NS India Vizag plant covers an area of slightly over 110 acres, where different species of avenue plants were raised. Plantations began since 1998 and by now the number of plantation has been recorded around 73,000 plus plants and shrubs etc and has been a concerted effort for the last 3 years specifically after HUD –HUD cyclone was hit on East Coast where all most 90% of the plantation got damaged.

Also planted fruit bearing trees in the plant like Banana, Guava, Sapota, Orange and vegetables like leafy, reddish, Coriander Leaves, Curry Leaves Etc

Vizag Bowl Area typically represents the Semi-arid, and subtropical area with moderate rainfall. The climate is hot and humid with medium velocity winds. Plant Area Soils were shallow with low fertility and substantial salinity. AM/NS India Vizag has taken up greening activities as a challenge under such adverse conditions.

All plantations are covered under water sprinkling system arrangements which has resulted in saving of water which is recycled water from the slurry pipe line as it is a precious and rare commodity in Vizag due to water available is with high salinity, where rain water harvesting could not be attempted due to shallow areas with high saline water.

Apart from the in plant greenery AM/NS India Vizag added greenery in the Vizag city with about 1,00,000 no. plants at different location like schools, colleges, public places Etc under the most prestigious Green Visakha project which was initiated by Parliamentary Standing committee and Govt. of AP.

Once the saplings are planted, its maintenance is undertaken by us for at least one year with watering is done through tankers. Further commitment that other major initiative of conceptualisation of afforestation inside the plant took as a challenge under the adverse site conditions which not at all suitable for such activity, nevertheless Greening the Plant Premises program is which practices part of Essar Vizag ongoing programme.

In order to ensure supply of adequate numbers where replacement is required with new saplings for the plantation programme, AM/NS India Vizag has developed a small scale nursery within the plant at which saplings of forestry and other plants are raised with limited count of samplings/shrubs for urgent replacement purposes.

Besides plantation, efforts are being undertaken to improve aesthetics in plant and other office premises by developing gardens and lawns Etc.

<table>
<tr><td> 
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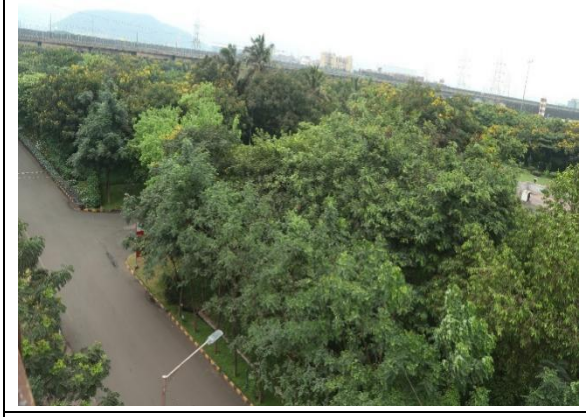
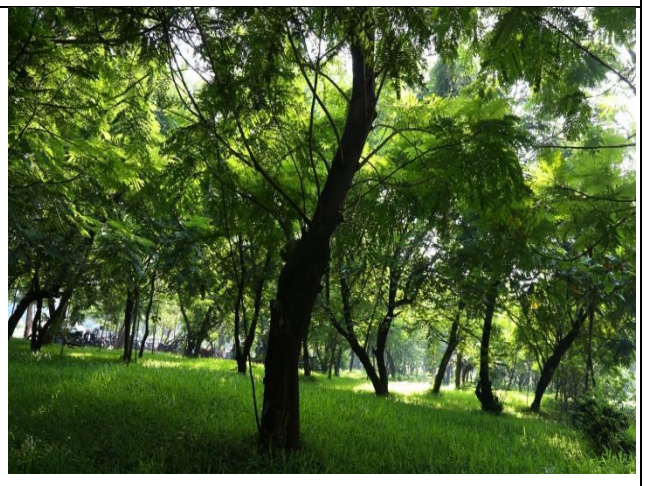
<tr><td>Plant Main Entrance front view</td><td>Main entrance Internal Road</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Plant Inside road</td><td>Plant view from Fly Over</td></tr>
</table>

	
Internal road in the plant	Shade grass and Plantation inside the plant
	
Arial view of the plant	Arial view of the plant
	
Internal roads and plantation	Internal Plantation

Greenery developed all along the boundary with a spacing of 200-300 mtrs covering all the four corners and thick green belt developed inside the plant.

- **CSR / Peripheral development work**
  - **a. Health**

Health		
Programme	**Villages Covered**	**Beneficiaries**
Providing food to migrant workers in Visakhapatnam City (COVID-19 Lock Down)	1	350
Distribution of Ration 5 kgs rice and 1 soap to no. of familes at Kondasanta, Ramapuram, and Pedapeta.	3	220
Distribution of Masks -4000 -	3	4000
Distribution of PPE Suits for Doctors	1	300
Financial support on COVID-19Control and prevention of Spread of Novel Corona Viras-Financial support to the District Administration	1	1000
Financial support on COVID-19Control and prevention of Spread of Novel Corona Viras-	1	500
Financial support on COVID-19 Control and prevention of Spread of Novel Corona Viras-Visakhapatnam Port Trust	1	5000

Distribution of 4 nos. Water Filters Govt. MPP Schools and Anganwadi Centers at Ravimanupakalu and Nutulabandha villages	2	100
Total	**13**	**5470**

b. Education

Education		
Programme	**Villages Covered**	**Beneficiaries**
Providing of Chalk boards Govt. MPP Schools at Kondasanta, and Pedapeta	2	40
Distribution of 34 nos. of School benches to Govt. MPP Schools Ramapuram- 5 numbers, Pedapeta-8 nos., Ravimanupakalu- 12 nos., and Nutulabandha 9 nos.	4	100
Total	**6**	**140**
		

Sports & Culture

Sports & Culture		
Programme	**Villages Covered**	**Beneficiaries**
Distribution Sports material St. Peters Elementary School, Gnanapuram, Visakhapatnam.	1	400
Total	**1**	**400**

Environment

Environment		
Programme	**Villages Covered**	**Beneficiaries**
Organizing of World environment day at Pellet Plant Complex.	1	68
Organizing of World Ozone Day Online elecution and poster design competition (total number of schools participated 56 numbers)	1	132
Total	**2**	**200**

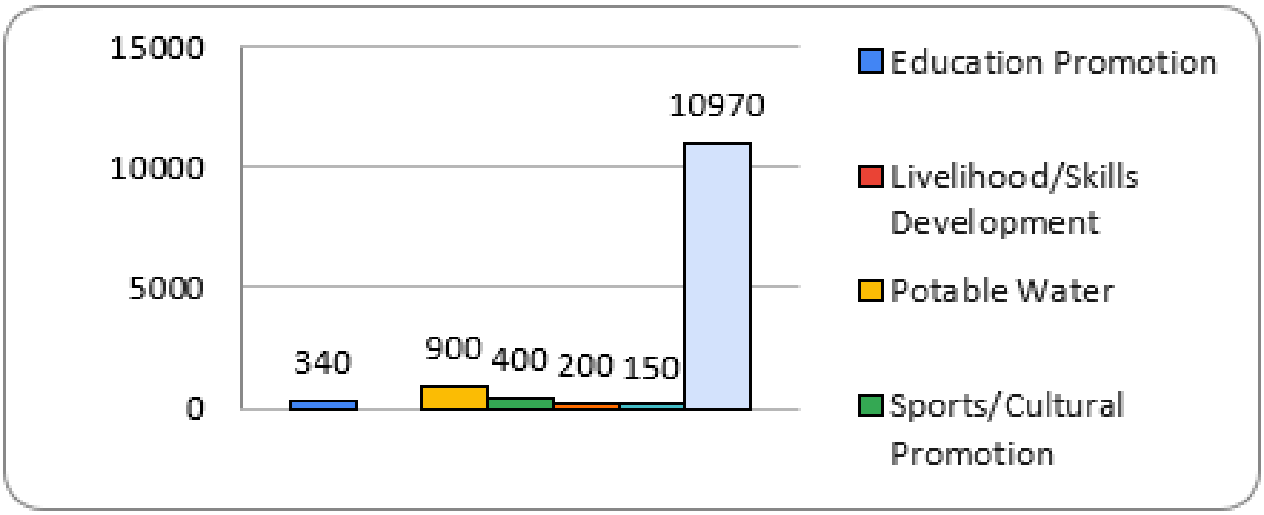
Potable water

Potable Water		
Programme	**Villages Covered**	**Beneficiaries**
Installation of RO Water Purifier and Water Cooler St.Peter`s Elementary School, Gnanapuram, Visakhapatnam	1	400
Repair of existing 4 nos. hand pumps Kondasanta- 2 nos., Ramapuram -1 no. and Batchinta-1 no. villages.	3	500
Total	**4**	**900**

Infrastructure:

Infrastructure		
Programme	**Villages Covered**	**Beneficiaries**
Distribution of Utensils, chairs, tables, water drums etc. Distribution of Utensils, chairs, tables, water drums etc. Nutulabandha village 150	1	150
Total	**1**	**150**

Beneficiary coverage: April 2020- March 2021		
S.No.	**Focus Area**	**Beneficiary coverage**
1	Health care services	10,970
2	Education Promotion	340
3	Livelihoods/ skills development	0
4	Potable water	900
5	Sports/ culture promotion	400
6	Environment Protection	200
7	Infrastructure Development	150
TOTAL		**12,960**



CONCLUSION

It is a well-known phenomenon that any industrial project, thereof, invariably impacts the surrounding economy in a positive way. The plant has generated direct & indirect employment within the plant to the extent of 1050. Additionally, there is significant generation of employment and economic benefits to various suppliers and consumers linked with the project. The project is technically sound and financially viable. The company has received many awards as mentioned below:

Sr No.	Awards Won in FY 14-15 (With Photographs if any)	Photograph
1	Gold Award- for CSR Activities -2014	
2	Silver Award for Safety-2014	

3	Best CSR Practices Award-2014	
4	Gold Award for Safety- 2015	
5	Silver Award for Environment-2014	
6	Green Award 2017