JSW Steel Limited

Vijayanagar Works :
P.O. Vidyanagar - 583 275,
Dist. Ballari, Karnataka, India.
CIN. : L27102MH1994PLC152925
Phone : +91 8395 250 120-30
Fax : +91 8395 250 132/142
Website : www.jsw.in

O/C

JSWP/ENV/GOV/KSPCB//STM/092025/4036 **Date 24.09.2025**

To,

Member Secretary,
Karnataka State Pollution Control Board,
5th Floor, #49, Parisara Bhavan, Church Street,
Banglore-560 001

24/09/2025

Sub: Environment Statement for the Financial Year 2024-2025

Ref:

1. **Combined Consent Order No. AW 328970 PCB ID 10357 Dated 31. 12.2021**
2. **Combined Order No. W-341737 PCB ID 11777 Dated 03.02.2024**
3. **Combined Order No. AW-342445 PCB ID 10357 Dated 14.03.2024**

Dear Sir,

With reference to the above subject, we are submitting herewith the Environment Statement FY 2024-2025 report for our integrated Steel Plant JSW Steel Limited, Vijayanagar Works located at Post Toranagallu, District Bellary, Karnataka.

Submitted for your record please.

Thanking You,
Yours faithfully
Authorized Signatory
For M/s JSW Steel Limited

Mr. Godavvarthi Jaya Prakash
Associate Vice President (Environment & Sustainability)

CC:

I. Environmental officer, KSPCB, Regional Office, 4th Main, Kuvempunagara, Bellary 583104
II. Director, Regional Office MOEF (SZ), Kendriya Sadana, IV Floor, E&F Wing, 17th Main Road, Koramangala, Banglore-560034
III. Regional Director, CPCB, A-Block, Nisarga Bhavan 1st & 2nd Floor, 7th D Cross, Thimmaiah Road, Shivaji Nagar, Bengaluru-560079.

iv. Case file

ENVIRONMENTAL STATEMENT

For Financial Year 2024-2025

BY

JSW STEEL LIMITED

VIJAYANAGAR WORKS

Toranagallu, P.O. Vidyanagar Dist. Ballari Karnataka-583275

ENVIRONMENTAL STATEMENT

Of

JSW STEEL LIMITED,

VIJAYANAGAR WORKS

TORANAGALLU

for

Financial year from 01st April, 2024 - 31st March, 2025

(In the prescribed Form # 5)

As specified by Rule 14 of The Environment (P) Rules, 1986

&

Notified by G.S.R. # 396 (E) dated 22.4.1993

PART-A

GENERAL INFORMATION ABOUT THE PLANT

Statutory Clearances Details:

1. JSW Steel Limited has been granted Environmental Clearance vide EC identification no. EC24A1001KA5580178S and file no. J-11011/489/2009-IA.II(I) dated 25.07.2024 for 13 MTPA Crude Steel Production capacity
2. Combined Consent Order No. AW 328970 PCB ID 10357 Dated 31.12.2021 for JSW Steel Limited Integrated Steel Plant of capacity 13 MTPA
3. Combined Order No. W-341737 PCB ID 11777 Dated 03.02.2024 for Townships merged with JSW Steel Limited
4. Combined order NO. AW-328970 PCB ID: 10357, Dated: 31.12.2021 for M/S JSW Steel Limited w.r.t utilization of Low Sulphur Pet Coke of quantity 9,28,000 MTPA installed at 13 MTPA Integrated Steel Plant.
5. Amendment to CFO Expansion Order No. AW-342445 PCB ID 10357 Dated 21 Feb 2025 currently valid upto 30.06.2026.
6. Biomedical Waste Management One-Time Authorization for operation of Occupational Health Facilities within the plant Authorization No. 214246 PCB ID: 278097, dated 07/04/2025
7. JSW STEEL LIMITED has been granted as a Brand Owner Regn. No. BO-17-000-08-AAACJ4323N-23 dated 10-05-2023, registration as a Brand Owner; and Importer Regn. No. 20250308085448680 41 dated 06-07-2025, registration as an Importer for disposal of Plastic waste w.r.t plastic packaging as per EPR Action Plan under rule-13(2) of the Plastic Waste Management Rules, 2016, as amended.

1.	Name and address of the owner/ occupier of the industry operation or process	:	**Mr. Murugan P K,** President, JSW Steel Limited, Vijayanagar Works, Toranagallu, Ballari, Karnataka
1.a	Authorized person for the occupier	:	**Mr. Godavvarthi Jaya Prakash** AVP (Environment & Sustainability), JSW Steel Limited, Vijayanagar Works, Toranagallu, Ballari, Karnataka
2	Industry category	:	Primary Metallurgical Industry
	STC Code	:	14 (a)
3a.	Production capacity	:	Integrated Steel Plant (Crude Steel) 13 MTPA
b.	Units		

Sl. No.	Manufacturing facilities	Capacity
1	**Ore Beneficiation plants**	
	Ore Beneficiation plant -1&2	1 x 4.5 MTPA
		1 x 2.5 MTPA
		1 x 7.5 MTPA
		1 x 5.0 MTPA
2	**Pellet Plants**	
	Pellet Plant 1	1 x 5.0 MTPA
	Pellet Plant 2	1 x 5.0 MTPA
	Pellet Plant 3	1 x 6.8 MTPA
3	**Sinter plants**	
	Sinter plant 1	1 x 2.30 MTPA
	Sinter plant 2	1 x 2.30 MTPA
	Sinter plant 3	1 x 5.75 MTPA
	Sinter plant 4	1 x 2.30 MTPA
4	**Coke Oven – Recovery**	
	Coke Oven 3	1 x 1.5 MTPA
	Coke Oven 4	1x 2.0 MTPA
	Coke Oven 5	1 x 3 MTPA
5	**Hot metal – Corex**	

Sl. No.	Manufacturing facilities	Capacity
	Corex 1	1 x 0.80 MTPA
	Corex 2	1 x 0.80 MTPA
6	**Hot metal - Blast Furnace**	
	Blast Furnace 1	1 x 2.5 MTPA
		With 3 x 170 TPD VPSA system
	Blast Furnace 2	1 x 2.17 MTPA
	Blast Furnace 3	1x 4.4 MTPA
	Blast Furnace 4	1 x3 MTPA
7	Metal Granulation Plant	1 x 2.7 MTPA
8	DRI	1 x1.2 MTPA
9	**Pig casting machine**	
	Pig casting machine 1	1 x 1200 TPD
	Pig casting machine 2	1 x 3600 TPD
	Pig casting machine 3	1 x 3600 TPD
10	**Steel Melting Shop**	
	Steel Melting Shop 1 BOF	1 x 3.8 MTPA
	Steel Melting Shop 2 BOF	1 x 6.4 MTPA
	Steel Melting Shop 3 EAF	1 x 1.5 MTPA
	Steel Melting Shop 3 ZPF	1 x 1.5 MTPA
11	**Slab casters**	
	SMS Slab caster 1 – 3.2 MTPA	
	Slab caster 1 & 2	2 x 1.05 MTPA
	Slab caster 3 & 4	1.1 MTPA
	SMS Slab caster 2 – 6.4 MTPA	
	Slab caster 5, 6, 7, 8	4 x 1.6 MTPA
	SMS Slab caster 3 – 1.6 MTPA	
	Slab caster 9	1 x 1.60 MTPA
12	**SMS Billet caster**	
	Billet caster 1	1 x 1.5 MTPA

Sl. No.	Manufacturing facilities	Capacity
	Billet Caster 2	2 X 1.5 MTPA
13	**Lime plant with (Along Lime Grinding Units)**	
	Lime Calcination plant 1 LGU 1	4 x 300 TPD
		1 x 50 TPD
	Lime Calcination plant 2 LGU 2 & 5	4 x 300 TPD + 3 x 600 TPD
		2 x 400 TPD
	Lime Calcination plant 3 LGU 3 & 4	2x600 TPD
		2 x 400 TPD
14	**Finishing mill**	
	Hot strip mill 1	1 x 4 MTPA
	Hot strip mill 2	1 x 5.2 MTPA
15	**Cold Rolling Mill**	
	Cold Rolling Mill 1 Pickling Line cum Tandem Cold Mill – 1 Continuous Galvanizing Line 2 & 3 Color Coating Line Electrolytic cleaning Line Batch Annealing Furnace Annealing cum Coating Line	1.8 MTPA 1 x 1.8 MTPA 2 x 0.45 MTPA 1 x 0.5 MTPA 1 x 0.7 MTPA 1 x 0.7 MTPA 1 x 0.2 MTPA (Silicon Steel)
	Cold Rolling Mill 2 Pickling Line cum Tandem Cold Mill – 2 Continuous Galvanizing line 1 Continuous Annealing line 1 & 2	2.3 MTPA 1 x 2.3 MTPA 4 x 0.25 MTPA 2 x 0.95 MTPA
	Cold Rolling Mill 3	1 x 2.3 MTPA
16	**Wire Rod mill**	
	Wire Rod mill 1	1 x 0.6 MTPA
	Wire Rod mill 2	1 x 1.2 MTPA
17	**Bar rod mill**	
	Bar Rod mill 1	1 x 1.0 MTPA
	Bar Rod mill 2	1 x 1.2 MTPA
Auxiliaries		

Sl. No.	Manufacturing facilities	Capacity
18	PCF Coal Grinding unit	1 X 2.0 MTPA
19	Lime Briquetting plant (Including Dolo)	1000 Tonnes per month
20	**Captive Power Plants**	
	Captive Power Plants 1	100 MW capacity using BF & Corex gas
	Captive Power Plants 2	130 MW = using BF Gas
	Captive Power Plants 3	1 x 300 MW
		Coal + Gas based
	Captive Power Plants 4	1 x 300 MW
		Coal + Gas based
21	Coal Briquetting plant	2 unit of 0.3 MTPA
22	Coke Dry Quenching (CDQ)	4 units of 3.5 MTPA with power plant of 76 MW
23	Coal drier	100 tph (3 nos.)
24	Top gas recovery turbine for BF 3&4	2 unit of 12.4 MW
25	Top gas recovery turbine for BF 1	1 unit of 4 MW
26	JSW air port	1 Number
27	STP for Plant Domestic Sewage	1 x 500 KLD
28	Biogas Plant	1 x 1 TPD
		1 x 6 TPD
29	JSW Steel Processing Centre Units	1 x 0.5 MTPA
30	Slime pond	575 acres
31	Waste Heat recovery	At Sinter plants 2, 3&4 & Blast Furnace 3&4
32	Gas fired boilers	4 units of 1 x 60 TPH & 3 x 60 TPH
33	Mobile crushing and screening units	30,000 TPD
		(12 no's- Crushers of 175 TPH)
		(15 no's - screening plants of 200 TPH)
34	Batch mixing plant	500 m3/hr.
35	I-Shop	3000 TPA
36	Rh Degasser at SMS-2	1.9 MTPA
37	Rubber mill at CRM-1	1 unit - 550 rolls per month

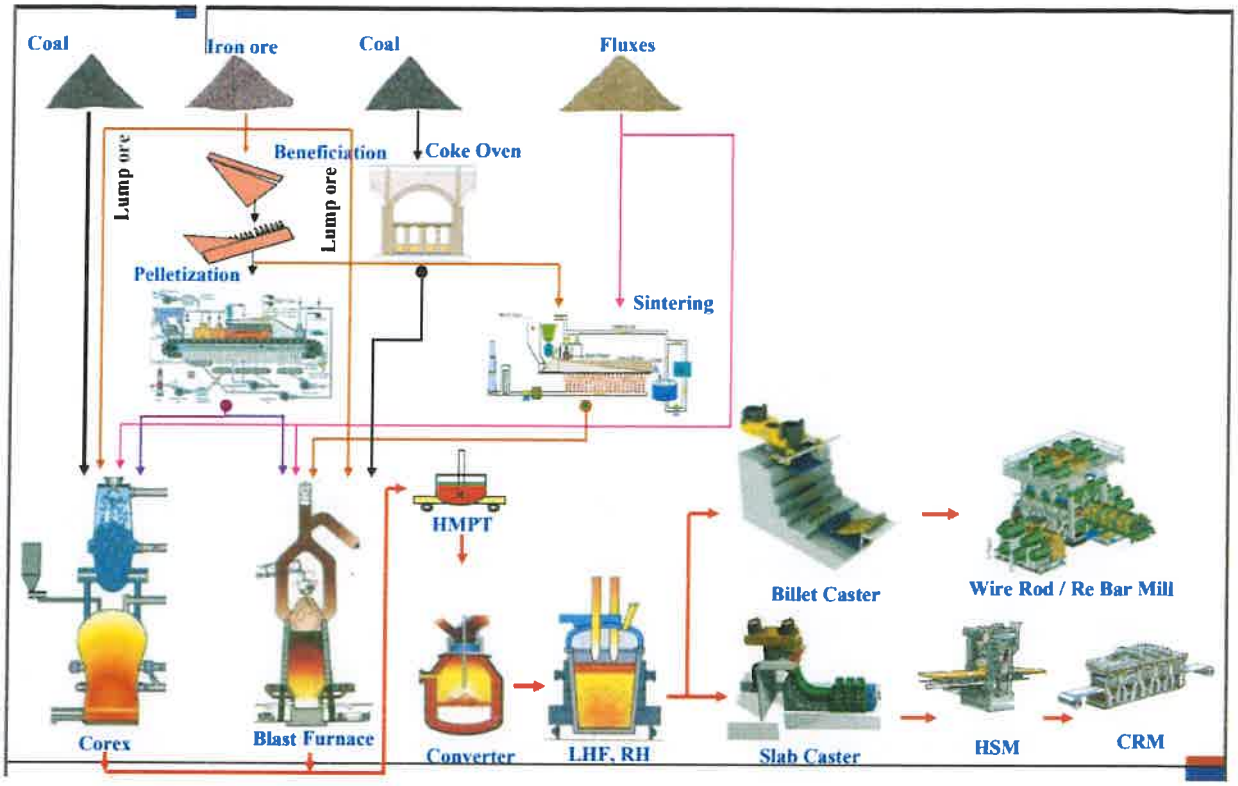
Sl. No.	Manufacturing facilities	Capacity
38	Auto scarfing of slabs	150000 tonnes per month
39	Recovery of iron ore from slime	1x0.8 MTPA
40	RMHS	1 X 5 MTPA
		1 x 10 MTPA
		With wagon tippler & Stack Reclaimer
42	Corex slag & clinker Grinding & mixing unit	0.2 MTPA (1x 2 lakh tons per annum)
43	BOF slag crushing plant	80000 TPM
44	Incinerator	1 No 250 kg/hr,1 No 500 kg/hr
45	Micro pellet plant	1 x 0.75 MTPA
46	Mill Scale Briquetting plant	1 x 0.22 MTPA
47	Waste to Wealth Plant	1 x 0.22 MTPA
48	Granulated Iron making slag sand plant	2.5 MTPA
		(1 X 40 TPH, 2 X 125 TPH)
49	BOF Slag sand & aggregate plant	1 x 6 MTPA
50	Alumina kilned LHF Briquetting plant	1 x 0.11 MTPA
51	MSW Plant	1 number
		1 x 10 TPD (Refuse Derived Fuel)
53	HSM 1 Up-gradation	From 3.5 MTPA to 4 MTPA
54	Wire Rod Mill 2	1 x 1.2 MTPA
55	Raw material handling system upgradation	5 MTPA to 6 MTPA
56	Ash Pond	AP 1 : 26.67 Acres AP 2: 30 Acres

Township Facilities

Sl. no	STP Location	Capacity (m3/day)	Technology/ Recycle & Reuse
1	Vidyanagar	1500	MBR upgraded from FAB. Recycled to 5 MTPA process and Green belt
2		1000	Reed bed. Reused for Green belt
3	VV Nagar	1200	SAFF technology Recycled in CRM-2 process through ETP and R.O plants
4	Shankar Hill town	3000	MBR Technology. Recycled in CRM-2 process through R.O plants
5	Hill Side Township	1560	MBR Technology. Recycled to 5MTPA process and Green belt
6	Lake view	400	MBR Reused for Green belt
7	Sun rise Valley	120	MBR Reused for Green belt
Total capacity		8780 m3/day	

4	Year of establishment	:	1994
5	Date of the last environmental statement submitted	:	30.09.2024

PROCESS FLOW SHEET



Process Description for 13 MTPA Integrated Steel plant

The manufacturing process is through the conventional route of blast furnace (BF)-basic oxygen furnace (BOF) route with continuous casting of liquid steel to slabs and / billets followed by steel finishing operations to meet the specific quality and shape requirements of the consumers.

The principal process steps involved are;

(i) Agglomeration through Pelletizing & Sintering of iron ore fines with coke and recycled dusts to make pellet & sinter burden for Blast Furnace.

(ii) Iron making in Blast Furnaces (BFs) and COREX units from lump iron ore and agglomerates with coal /coke and fluxing materials;

(iii) Coke making in by-product recovery type coke ovens;

(iv) Conversion of hot metal to liquid steel by oxygen blowing in BOFs followed by refining of liquid steel in ladle furnaces with addition of alloying materials for micro adjustment of steel chemistry;

(v) Continuous casting of refined liquid steel to slabs/billets in suitable casters;

(vi) Hot rolling and cold rolling operations to produce various types of shaped steel products of desired size and dimensions.

A. **Ore beneficiation plant**: The alumina content of iron ore is required to be lowered to levels acceptable for iron production in blast furnaces. This is carried out in an ore beneficiation plant where the ore is washed with water to separate the gangue materials. The slime is collected in a slime pond for future use. There are two ore beneficiation plants.

B. **Coke making**:

Metallurgical coke is used as the reductant for reduction of iron ore to produce hot metal. Metallurgical coke is produced by carbonizing the coking coal at a temperature of around 1200^0C in absence of oxygen atmosphere in closed door multiple tall ovens. The volatile matter is liberated resulting in formation of coke due to carbonization in the ovens. The

energy necessary for the carbonization process is provided by the Blast furnace or the coke oven gases.

The crude coke oven gas, having a potential heat value is cooled, separated from tars, naphthalene and ammonia to produce clean coke oven gas for use as plant fuel in various heating applications.

C. Agglomeration:

a) Sintering: Sintering is a high temperature (1200-1300^{0}C) process for agglomeration of iron ore fines with coke breeze and other fluxes like limestone, and recyclable solid wastes like lime fines, BOF sludge, BF flue dusts etc which are blended in base mix yard.

b) **Pelletisation**: Pelletizing is a high temperature operation (1200-1400^{0}C) for agglomeration of iron ore fines (smaller than those used for sintering) with coke breeze & fluxes. The mix is passed through a pelletizing disc where green pellets of 10-12mm dia are produced. These are then sent to indurating furnace to produce pellets.

D. Iron making

a) Blast Furnace: Sized iron ore, pellet, sinter and coke along with other fluxing materials are charged to the tall vertical BF for production of hot metal in presence of hot blast air. The temperature within the furnace is above 1600^{0}C. The gangue minerals present in the iron ore are converted to slag known as BF slag and 'Fe' content of the oxide ore gets converted to molten iron due to reduction of iron oxides of the ore with carbon present in the coke. In order to have adequate carbon for reduction purpose, as well as to reduce coke consumption, powdered coal is injected into the furnace. The hot iron metal after desulphurization with carbide compound is ready for conversion to steel in BOF. For balancing the hot metal production and consumption, provision of pigging of the hot metal becomes necessary. The BF slag is granulated by water jetting and granulated BF slag produced can be used for cement making. The BF gas containing mostly Carbon monoxide (CO) is cleaned in venturi scrubbers, to bring down the dust level in the gas to below 5 mg/N cu m. The cleaned BF gas is used as plant fuel and for heating the BF stoves to produce hot blast air.

b) COREX: Liquid iron is also produced in COREX process using pellets and coal as raw materials. The process also produces a useful by product gas "COREX" gas which is used in mills. COREX process uses oxygen instead of air used in Blast Furnace. The reduction and melting is carried out in two chambers as done in Blast Furnace.

E. Lime calcinations:

Burnt lime (CaO) is required for steel making. Limestone is burnt in the tall vertical limekilns at a temperature of around 1050^0C to produce burnt lime. The energy required for the endothermic reaction is provided by fuel gases. The burnt lime collected at the bottom of the kilns is screened. Lime dusts are recycled to the Sinter Plant.

F. Steel making: In the Steel Melt Shop (SMS), the desulphurised hot metal along with burnt lime and fluxing agents is charged to the BOF. Carbon present in the hot metal is oxidized by controlled blowing of oxygen. The temperature of BOF is around 1700^0C, with the energy generated by the combustion of carbon present in the hot metal. The BOF gas having carbon monoxide and dust passes through the wet gas cleaning plant, comprising of venturi-scrubber where the dust in the gas is separated due to inertial impaction. The water containing dust is treated in a water treatment plant and recycled to the system. The clean BOF gas depending on 'CO' content is recovered and used as a fuel within the plant.

After tapping of BOF slag, the crude liquid steel is poured and transferred to ladle for further refining and chemistry adjustment in the subsequent steel refining operations. In this special type of ladle, crude liquid steel is vacuum-degasified and chemistry adjusted by addition of micro alloys to produce liquid steel of desired chemistry. Thereafter, the refined liquid steel is continuously cast to the slabs/billets in the casting machines.

G. Hot rolling of slabs / billets: The slabs/billets are reheated to a temperature of around 1250^0C in walking beam type reheating furnace. After descaling of heated slabs/billets/blooms by high pressure water jet, the same is hot rolled in separate mills to produce shaped products like hot rolled coils, wire rods, sections, rebars, plates etc. The products are ready for dispatch. Some of the intermediates like slabs and billets are also sold outside for carrying out finishing operations at the customer end.

H. **Cold rolling:** The coil from the hot strip mill is further processed in a cold rolling mill to produce value added products. In the CRM, the coils are pickled using hydrochloric acid to remove scales adhering to the surface of the coils. The pickled coil is further rolled in cold reversing mills to the desired thickness. A portion of the cold rolled coils are then processed in the batch/continuous annealing furnaces to produce annealed steel products. The heat energy for the annealing operation is provided by the fuel gases. The balance portion of the cold rolled coils is coated to produce special coated products. There is a provision for two types of coating of steel viz., galvanizing and color coating. While the galvanized cold rolled products are used mainly in the construction industry, the color coated products find wide application in the white goods sector.

I. **Power Plant**: In the process of manufacture of steel in the CO-BF-COREX-BOF routes, a large volume of fuel gases are generated from COREX, Coke ovens, Blast furnaces and BOF shops. While these gases are used in various heating applications, there will be a surplus amount of gases that can be used to produce power. In this, the surplus gases are burnt in a boiler to raise steam at high pressure which is used to generate power. The process steam required for the process is generated using gaseous fuel.

The generation of power from the surplus gases is an environment friendly option, as it eliminates the use of coal as the fuel for power generation along with its associated environmental problems like emissions of oxides of nitrogen & sulphur and disposal of fly ash.

J. **JSW steel has the following Captive Power Plant:**

- CPP-1: 100MW power plant based on COREX & BF gas.
- CPP-2: 130MW power plant based on heat from BF gas & COREX / Mixed gas.
- CPP-3 & 4: 2 X 300MW coal & gas based power plant.

K. **Slag to Sand Plant**: The granulated slag has pluzzonic properties and can be used in cement making. Thus the granulated slag is finding wide application in the cement industry as a raw

material for slag cement. The slag is finely ground and mixed with ground clinker in suitable portion for manufacture of cement. The ground slag also finds application as an admixture in civil construction. A 0.2mtpa cement plant is in operation within JSW Steel complex.

L. **Coal driers**: In order to conserve energy, 6 nos of coal driers are installed to reduce the moisture in coal fed to the corex unit.

PART –B

WATER AND RAW MATERIAL CONSUMPTION

i. Water consumption in m^3/d

Type of water	Water consumption in m^3/day	
	During the last Financial Year (2023-24)	During the current Financial Year (2024-25)
Industrial	72517	71062
Domestic (Plant Premises)	3237	4382
Domestic (Townships)	10115	10549

ii. Process water consumption per unit of product

Name of Products	Process water consumption per unit of products (m^3/tcs)	
	During the last Financial Year (2023-24)	During the current Financial Year (2024-25)
Crude Steel	2.36	2.36

Consumption of Raw Material

Raw material consumption per unit of product

Name of Material	Unit	Financial Year 2024-25	
		Crude Steel Production- 11683972 tons (11.68 MTPA)	
		Consumption in tons	Rate kg/tcs
Hard Coal	tons	2140321	183.18
Semi Hard Coal	tons	2699658	231.06
Semi Soft Coking Coal	tons	697768	59.72
Pet Coke	tons	235675	20.17
Anthracite	tons	319027	27.30
PCI Coal	tons	1107892	94.82
Corex Coal	tons	3042580	260.41
Steam Coal	tons	2698756	230.98
Coal fines	tons	1920267	164.35
Purchase Coke	tons	335508	28.72

Iron Ore lumps	tons	3658709	313.14
Iron Ore fines	tons	22898985	1959.86
ROM	tons	59877	5.12
Pellet	tons	68955	5.90
Limestone	tons	3982212	340.83
Dolomite	tons	2562534	219.32
Quartzite	tons	15133	1.30
BHQ	tons	57953	4.96
Bentonite	tons	87487	7.49
DRI in IM	tons	62899	5.38

PART-C

POLLUTION DISCHARGED TO ENVIRONMENT / UNIT OF OUTPUT

WATER AND AIR

a) Water

All the effluent generated from the steel plant complex is collected in the three number of guard ponds and the slime generated from ore beneficiation plant is collected in the slime pond located within the plant premises.

Water from the above is recycled within the steel plant and will be reused for dust suppression, green belt development, firefighting and other less critical applications. The water from guard ponds is recycled within the plant.

- JSW Steel Limited had provided Extensive water recirculation and recovery system to ensure Zero discharge from the plant premises.

- All the process units are equipped with the extensive water recirculation system with treatment facility (ETP), i.e. Clarifier / Thickener, Pressure Filters and cooling tower to recirculate water back to process.

- The remaining treated water meeting stipulated standards as per Schedule – 6 of EP Act, 1986 are collected in guard ponds GP-01, GP-02 & GP -03 and utilized in the secondary application such as ore washing, dust suppression, fire-fighting, slag quenching and green belt development.

- The details of the guard pond are given below

S.No	Guard pond no.	Capacity (m3)	Treated Blow-down water Source
1.	Guard pond #1	1,25,000	CRM 2, LP mills, HSM2, SMS2, PP1, BP1, CPP1, WWP, BF1 &2, Corex 1 &2, SMS 1 , I shop, HSM1
2.	Guard pond #2	1,25,000	DRI & SMS3, BF3, 60 TPH boiler and CPP2, Coke Oven 3, 4 & CDQ, JSWEL, GP3, GP1, WRM -2 and BRM -2.
3.	Guard pond #3	20,000	BF-4, CO-5, SP-2, 3 and 4.
Total Capacity		**2,70,000 m^3**	

- The water collected in guard ponds and again reused internally for secondary purposes in processes like Pellet Plants, sinter plants, Coke Oven Batteries for moisture addition purposes, as Makeup water of Ore Beneficiation Process, Fire-fighting circuit and Dust suppression at various units, Vehicle washing, slag quenching and green belt development inside the plant premises, Townships and in surrounding hillock regions.

- The guard ponds are de-silted/rejuvenated periodically and their water holding capacity restored. This Financial Year Guard Ponds are de-silted and rejuvenated and maintenance work of pumps and pump houses has been undertaken and the ponds are taken online for storage. This will ensure that there is no over flow form the Guard Ponds.

- We have taken special measures for reduce the water flow towards the Guard Ponds, by ensuring the operation of Individual water treatment units as below:-

Water Pollution Control Equipment	Nos
Water Circulation System	8 Nos
Guard Ponds	3 Nos
ETP's	9 Nos
RO Plant	8 Nos
Sewage Treatment Plant (STP) based on MBR technology	7 Nos
ZLD for Coke Ovens	1 No
CO2 injection project in SMS -01	1 No (500 m^3/Day)
Rapid Clarifier System for ID fan flushing water of SMS-1	1 No (800 m^3/Day)
Slime Recovery Plant RO	1 No (9000 m^3/Day)

- To sustain Zero Discharge, above latest and advance treatment technologies such as water circulation system – 8 No; Guard ponds – 3 No; ETPs – 9 No; RO Plant – 8 No; Sewage Treatment Plant (STP) based on MBR Technology – 7 No; ZLD for Coke Ovens – 1 No; CO2 injection project in SMS1 – 1 No; Rapid Clarifier System for ID Fan flushing water of SMS1 – 01 No; Slime Recovery Plant RO – 01 No
- With the above water pollution control system they are recycling and reusing water back to process and ensure zero discharge.
- The four designated outlets are equipped with the continuous effluent monitoring system which are connected to CPCB server.

Continuous Ambient Air Quality Monitoring at 06 stations FY2024-25

JSW Steel Vijayanagar works has installed 06 number of Continuous Ambient Air Quality Monitoring Stations around the JSW Steel Complex. Continuous Emission monitoring of PM_{10}, $PM_{2.5}$, SO_2, NOx & CO is being done at all 06 CAAQMS Stations. The data of all CAAQMS Stations is being transferred to CPCB/KSPCB Portal.

The location details of 06 CAAQMS Stations is as follows:

1. **Vidyanagar**
2. **Vaddu**
3. **Shankar Hill Township**
4. **10 MT**
5. **Sulthanpur**
6. **VV Nagar Township**

Continuous Ambient Air Quality Monitoring Stations

b) Air:

Quantity of pollutants measured around the plant is given below

Pollutants (Air)	Quantity of pollutants discharged (mass/day)	Concentrations of pollutants discharged (mass / volume)	% of variation from prescribed standards
	T/day	mg/Nm^3	%
Dust emission (PM)	20.10	23.82	-52.3563
SO_2 emission	31.63	264.31	-55.9478
NO_x emission	17.42	153.46	-48.8482

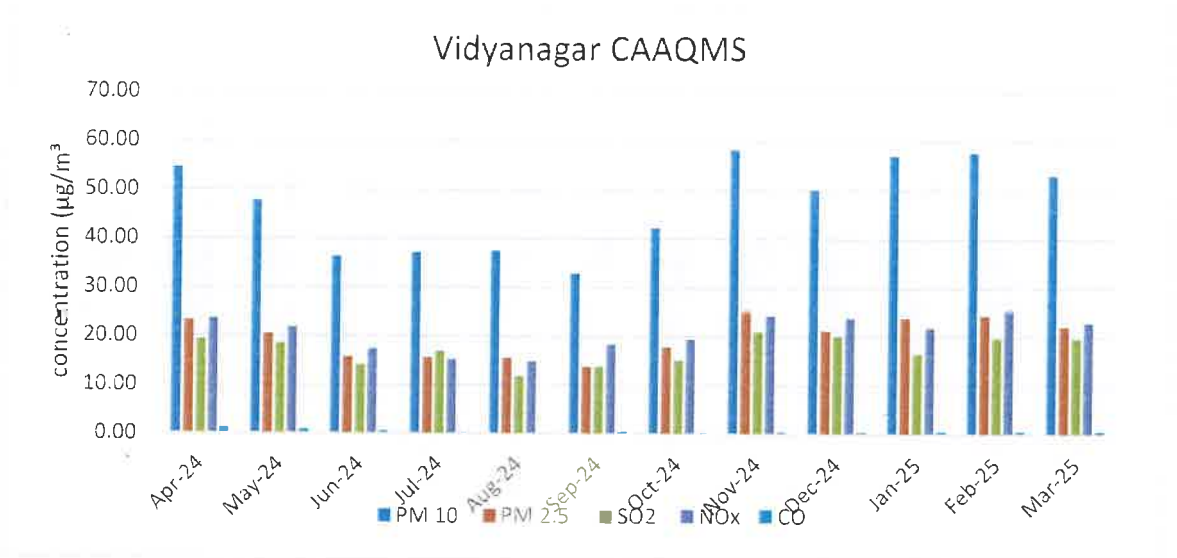
NAAQ Standard:

NATIONAL AMBIENT AIR QUALITY STANDARDS (2009)

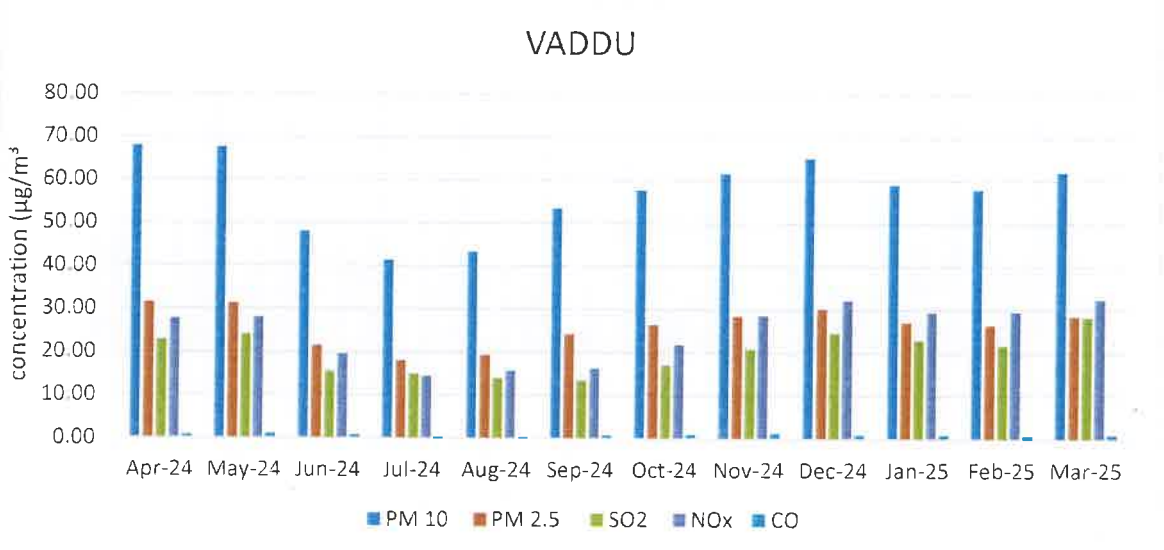
Pollutants	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO_2), $\mu g/m^3$	Annual *	50	20	-Improved West and Gaeke Method
	24 Hours **	80	80	-Ultraviolet Fluorescence
Nitrogen Dioxide (NO_2), $\mu g/m^3$	Annual *	40	30	-Jacob & Hochheiser modified ($NaOH-NaAsO_2$) Method
	24 Hours **	80	80	-Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM_{10}, $\mu g/m^3$	Annual *	60	60	-Gravimetric
	24 Hours **	100	100	-TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or $PM_{2.5}$, $\mu g/m^3$	Annual *	40	40	-Gravimetric
	24 Hours **	60	60	-TEOM -Beta attenuation

The data reported here is based on the time weighted average standard of 24 hrs as stipulated in NAAQS 2009.

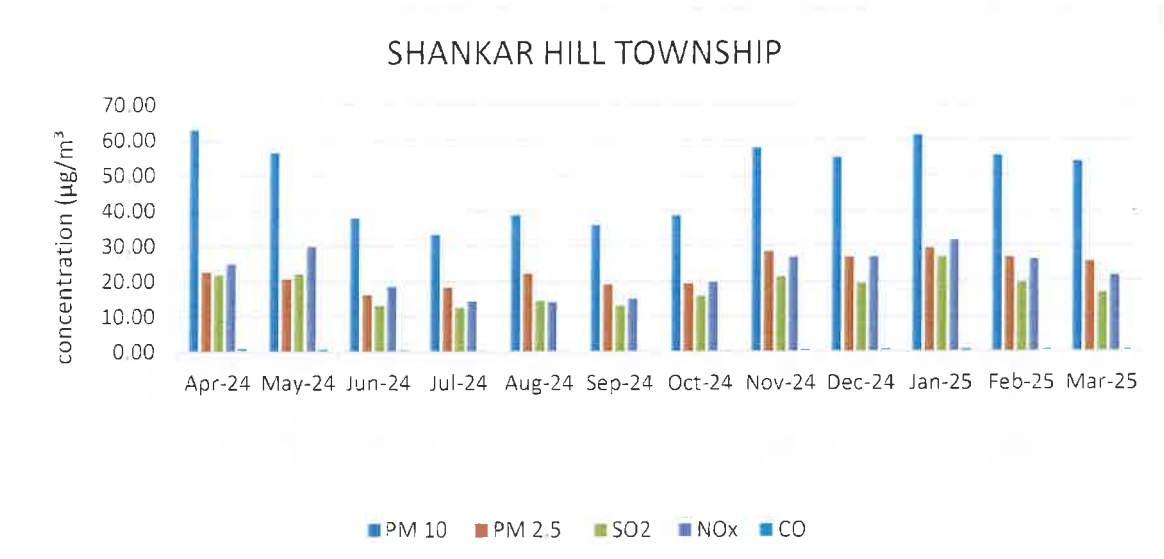
Continuous Ambient Air Quality Station Report – Vidyanagar 2024-25



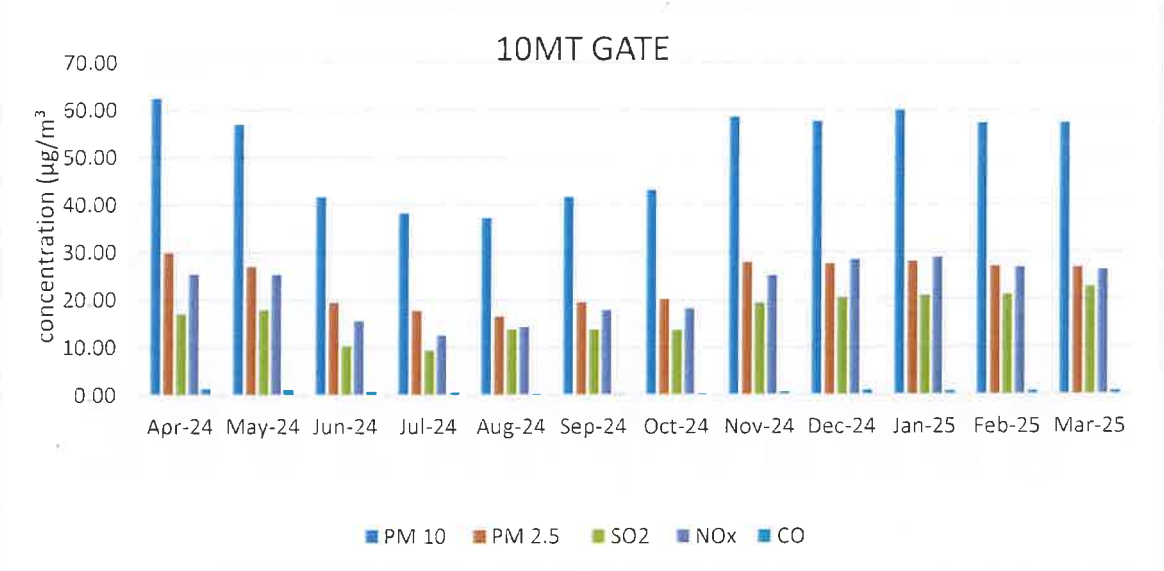
Continuous Ambient Air Quality Station Report – Vaddu 2024-25



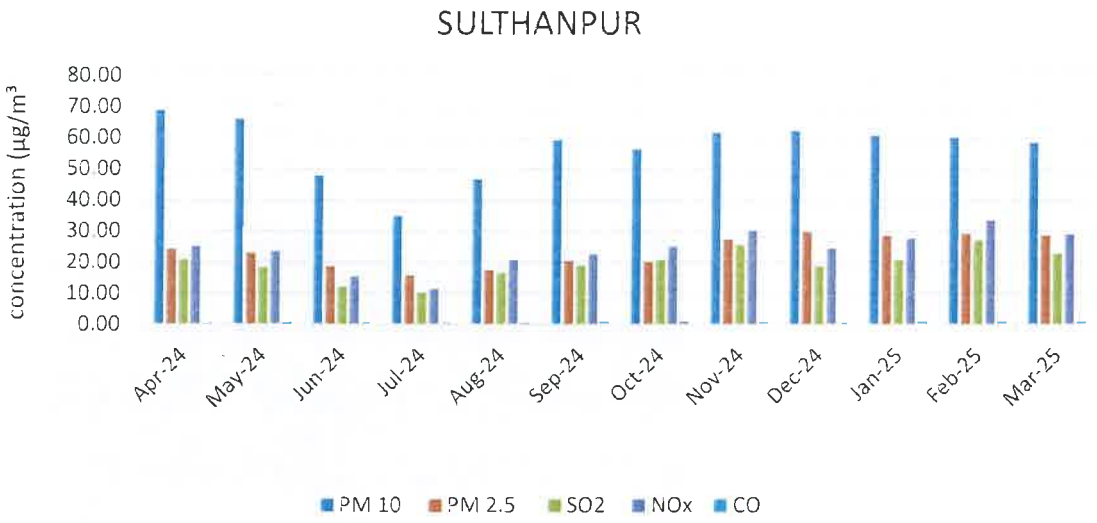
Continuous Ambient Air Quality Station Report – Shankar Hill Township 2024-25



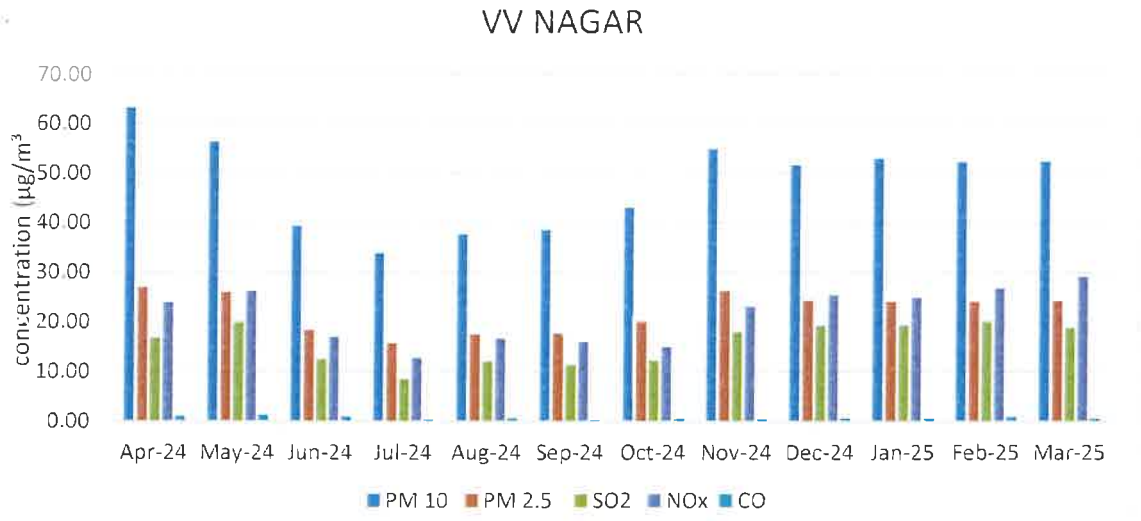
Continuous Ambient Air Quality Station Report – 10 MT 2024-25



Continuous Ambient Air Quality Station Report – Sulthanpur 2024-25



Continuous Ambient Air Quality Station Report – VV Nagar Township 2024-25

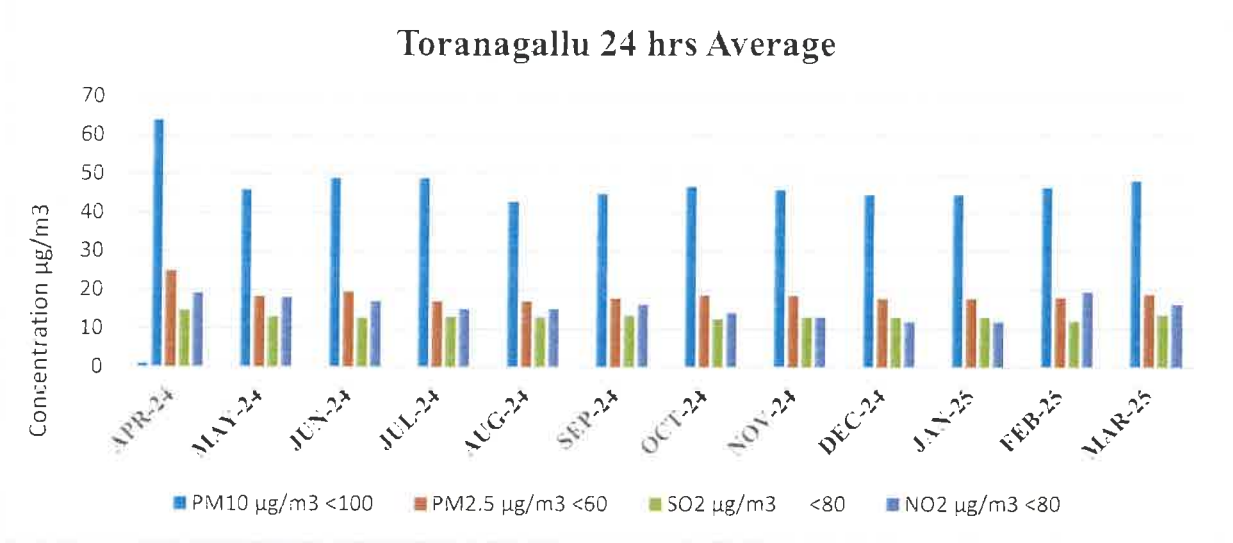


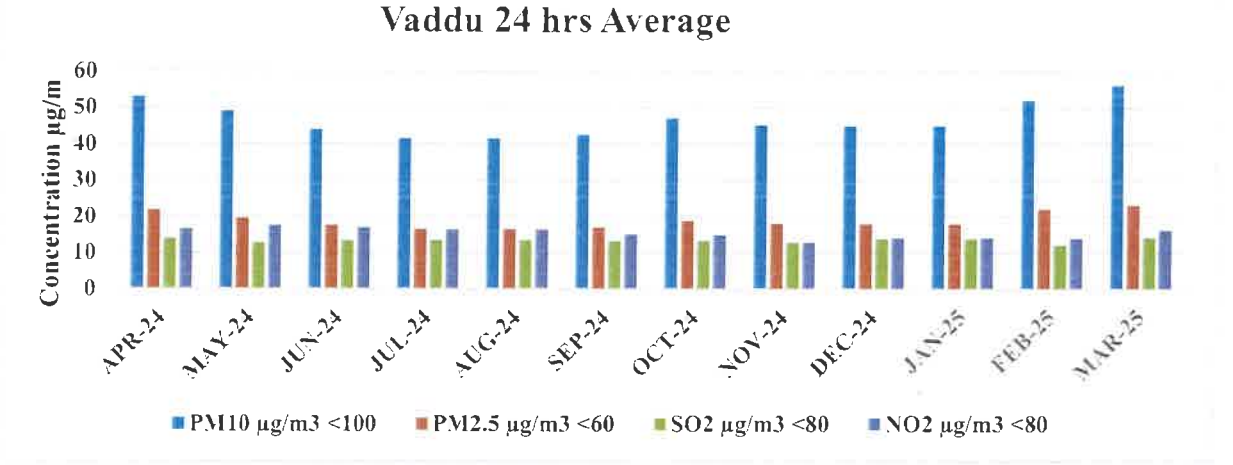
Ambient Air Quality Monitoring (Manual) at 11 stations FY 2024-25

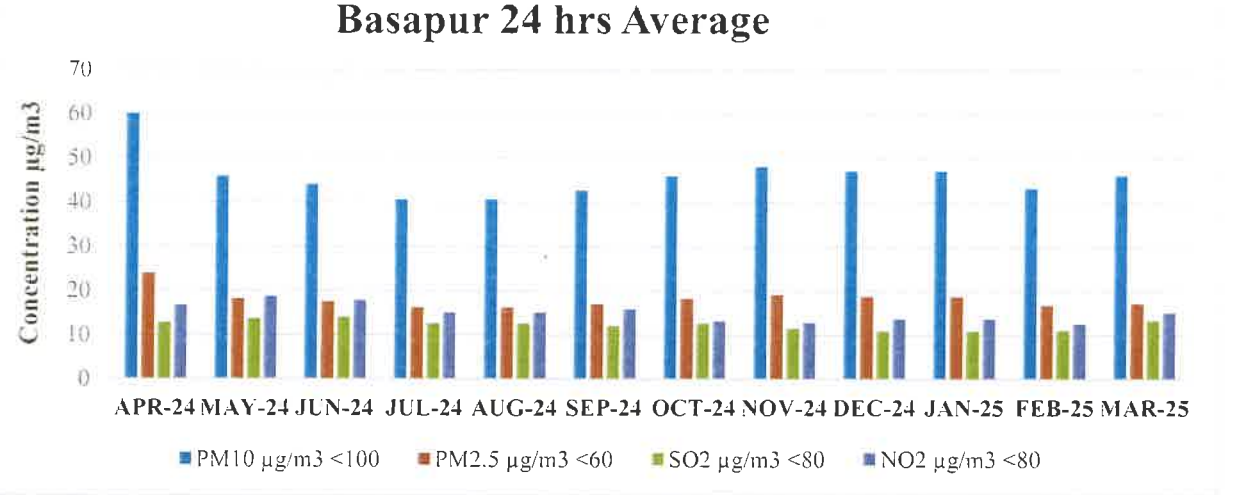
We are manual monitoring Ambient Air Quality Monitoring at 11 villages in nearby villages

1. Toranagallu
2. Vaddu
3. Basapur
4. Talur
5. Kurekuppa
6. Gadiganur
7. Kuḍitini
8. Sultanpur
9. Karadidhama
10. Hampi
11. Vidyanagar

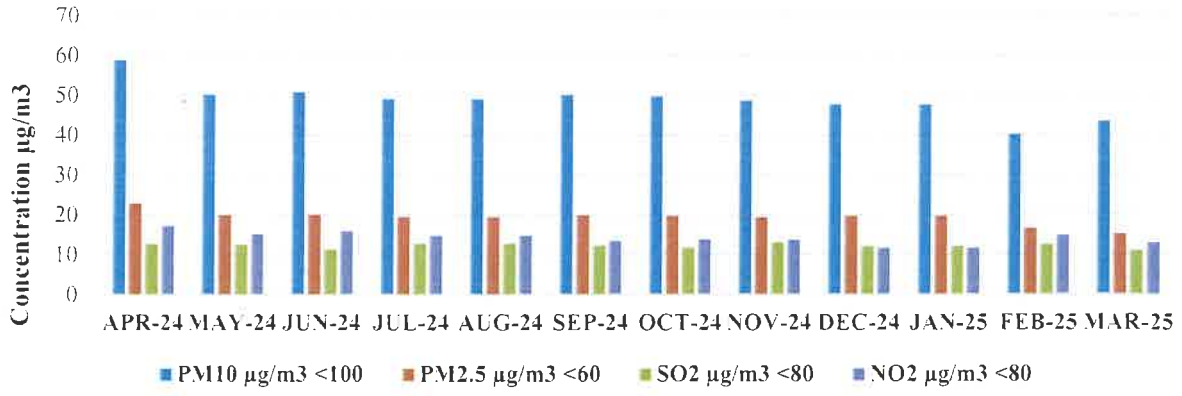
Ambient Air Quality Manual Monitoring Stations



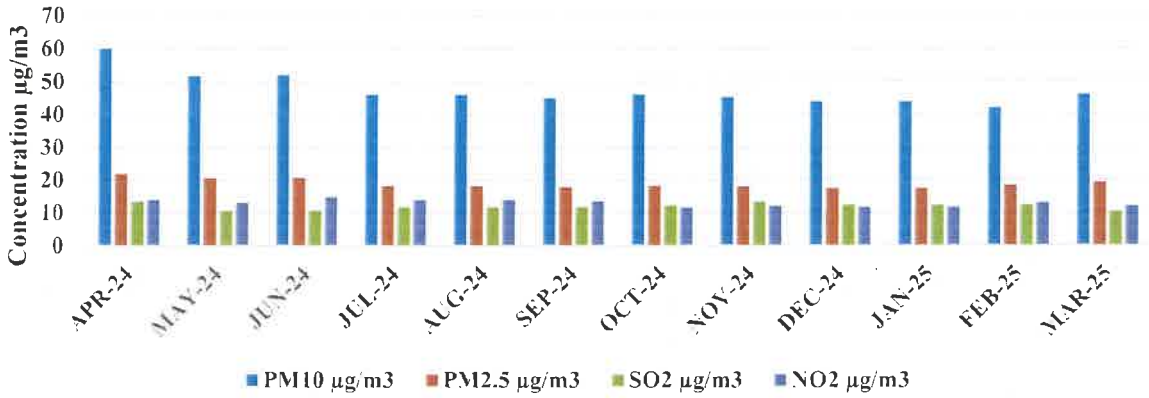




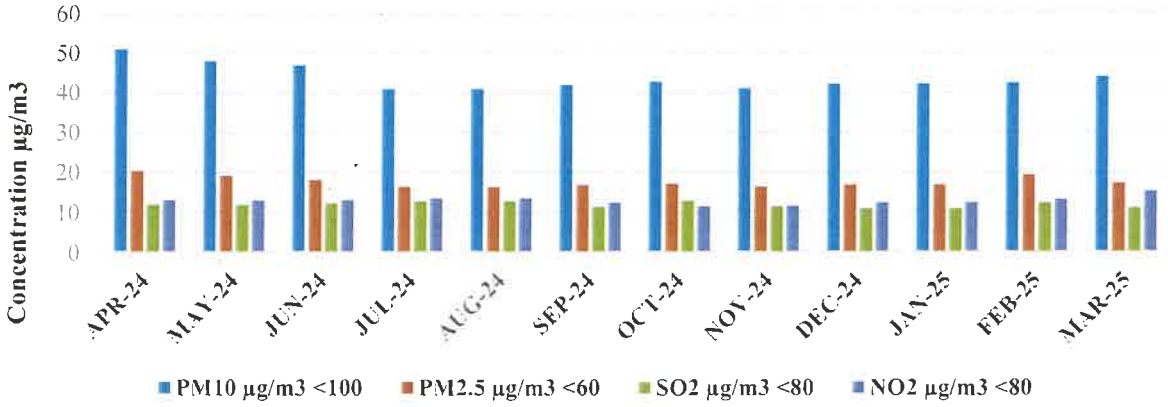
Kurekuppa 24 hrs Average

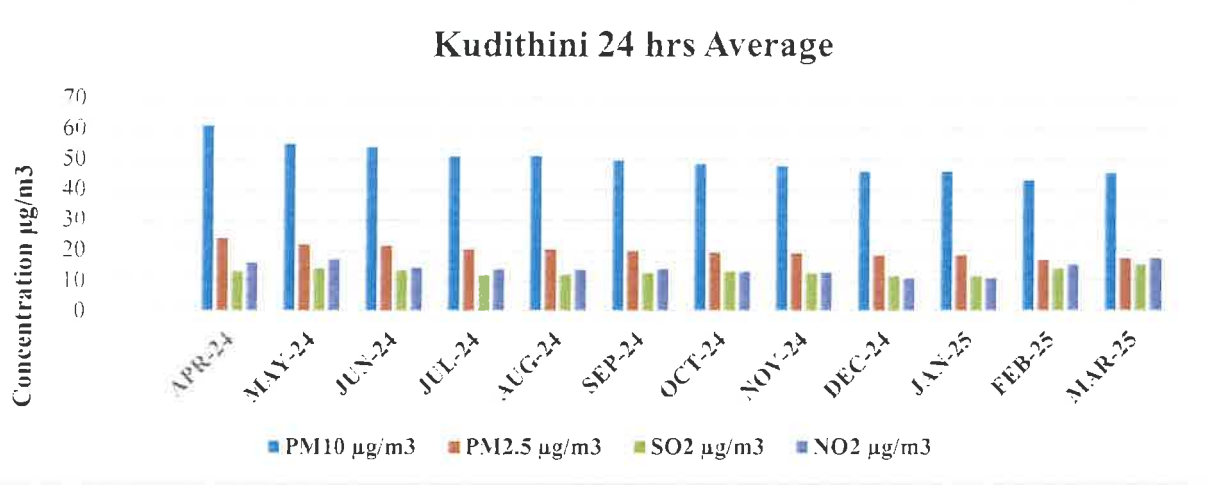


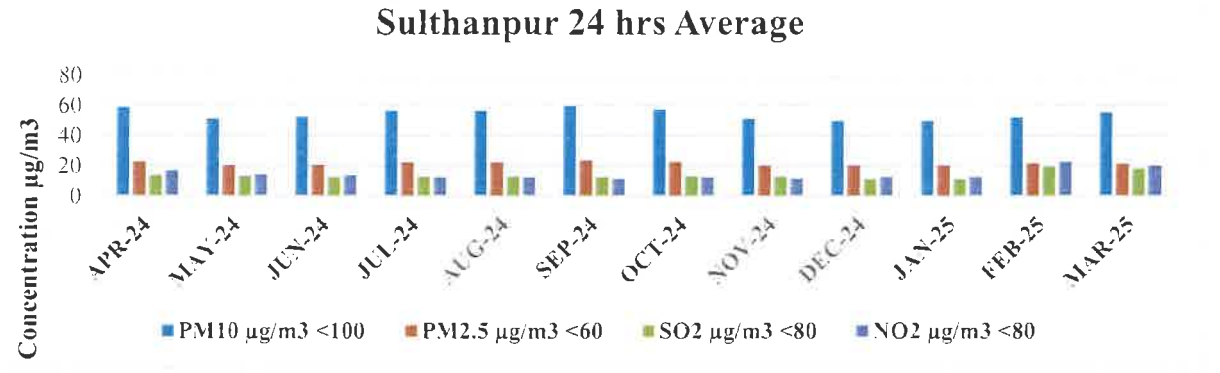
Talur 24hrs Average

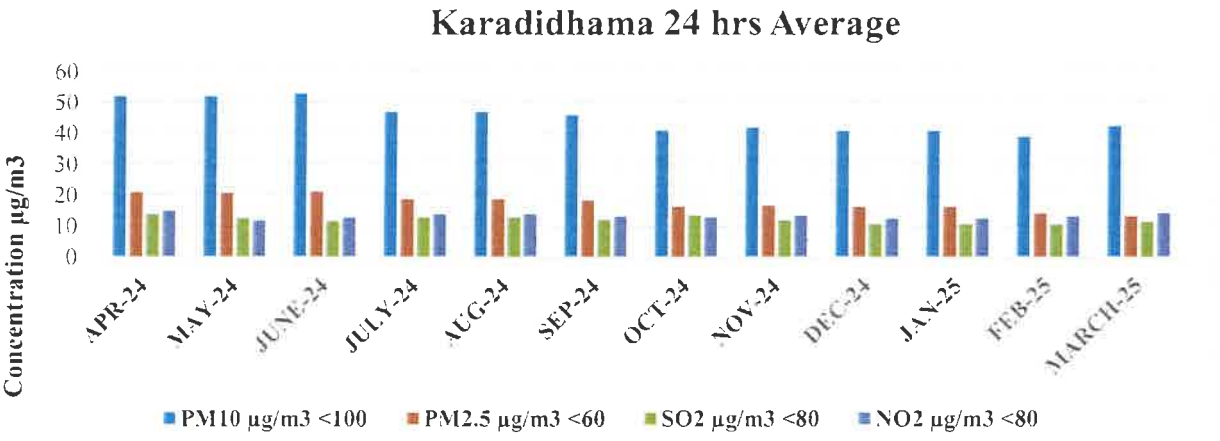


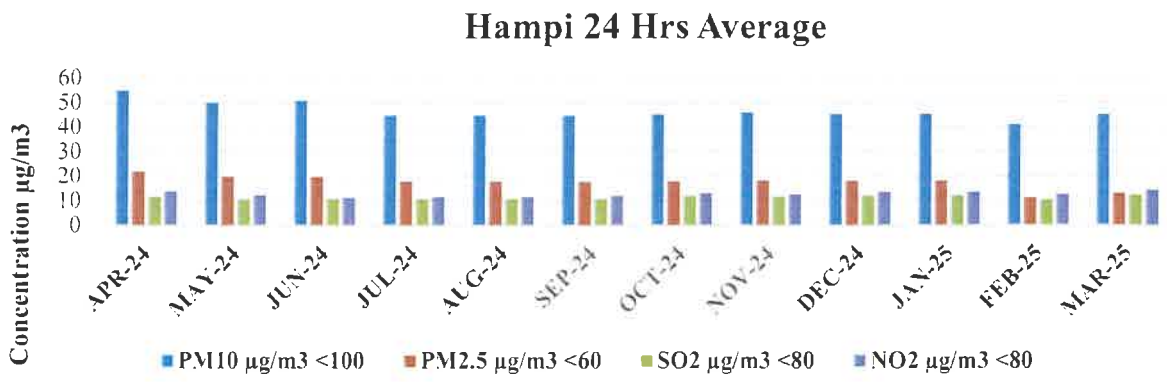
Gadiganur 24 hrs Average

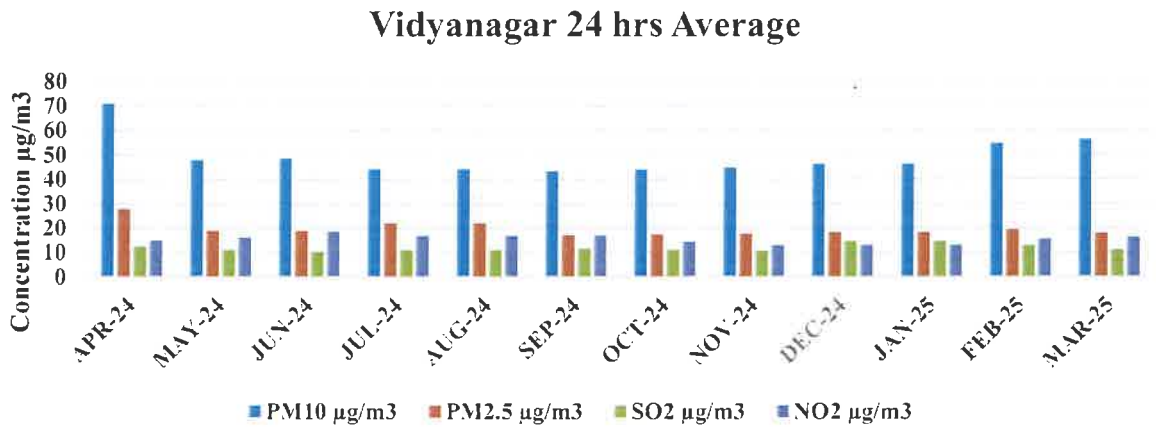



Kudithini 24 hrs Average
Concentration µg/m3
70
60
50
40
30
20
10
0
APR-24
MAY-24
JUN-24
JUL-24
AUG-24
SEP-24
OCT-24
NOV-24
DEC-24
JAN-25
FEB-25
MAR-25
PM10 µg/m3
PM2.5 µg/m3
SO2 µg/m3
NO2 µg/m3


Sulthanpur 24 hrs Average
Concentration µg/m3
80
60
40
20
0
APR-24
MAY-24
JUN-24
JUL-24
AUG-24
SEP-24
OCT-24
NOV-24
DEC-24
JAN-25
FEB-25
MAR-25
PM10 µg/m3 <100
PM2.5 µg/m3 <60
SO2 µg/m3 <80
NO2 µg/m3 <80


Karadidhama 24 hrs Average
Concentration µg/m3
60
50
40
30
20
10
0
APR-24
MAY-24
JUNE-24
JULY-24
AUG-24
SEP-24
OCT-24
NOV-24
DEC-24
JAN-25
FEB-25
MARCH-25
PM10 µg/m3 <100
PM2.5 µg/m3 <60
SO2 µg/m3 <80
NO2 µg/m3 <80


Hampi 24 Hrs Average
Concentration µg/m3
60
50
40
30
20
10
0
APR-24
MAY-24
JUN-24
JUL-24
AUG-24
SEP-24
OCT-24
NOV-24
DEC-24
JAN-25
FEB-25
MAR-25
PM10 µg/m3 <100
PM2.5 µg/m3 <60
SO2 µg/m3 <80
NO2 µg/m3 <80


Vidyanagar 24 hrs Average
Concentration µg/m3
80
70
60
50
40
30
20
10
0
APR-24
MAY-24
JUN-24
JUL-24
AUG-24
SEP-24
OCT-24
NOV-24
DEC-24
JAN-25
FEB-25
MAR-25
PM10 µg/m3
PM2.5 µg/m3
SO2 µg/m3
NO2 µg/m3

PART-D

HAZARDOUS WASTES

METHOD OF DISPOSAL

Hazardous Waste Generation in MT/A

Sl. No	Waste Category	Waste generated	Consented Quantity MT/A	Generated Quantity MT/A 23-24	Generated Quantity MT/A 24-25	Mode of Disposal
(a) From Process						
1	5.1	Used Oil	800	43.77	38.35	Collected in leak proof containers & disposed to CPCB registered & KSPCB authorized re-processer
2	4.1	Waste Oil	1000	457.16	340.69	
3	5.2	Oil soaked cotton waste	100	95.70	90.355	Stored in a secured manner and incinerated in captive incinerator.
4	13.1	Waste pickled liquor	200000	130797.50	150558.73	Stored in a secured manner and reprocessed in the plant.
5	12.1	Acid residue	400	282.26	144.1	Treated in ETP
		Alkali residue				Treated in ETP
6	13.4	Decanter Tank Tar sludge	700	481.77	510.71	Used back in Coke oven
7	13.5	Tar storage tank residue	200	38.24	0	Used back in Coke oven
8	35.2	Spent ion exchange resin containing toxic metals (Spent Nickel catalyst).	30	0	Nil	Used back in Micro Pellet making
9	35.4	Oil & grease skimming residue (Emulsion Slurry)	2000	1138.10	977.62	Sold to Authorised waste oil recyclers
11	35.3	Spent carbon from WTP/ETP	100	0	Nil	Used back in Micro Pellet Plant
12	37.1	Oily Sludge from mills (Sludge from wet scrubber)	500	363.875	476.45	Stored in a secured manner and incinerated in captive incinerator.

Sl. No	Waste Category	Waste generated	Consented Quantity MT/A	Generated Quantity MT/A 23-24	Generated Quantity MT/A 24-25	Mode of Disposal
13	37.2	Ash from incineration of hazardous waste, flue gas cleaning residue	100	70.61	78.36	Stored in a secured manner and disposed to TSDF.
14	33.1	Empty Barrels / containers/liners containing with Hazardous Waste	800	582.98	142.037	Stored in a secured manner and handed over to KSPCB authorized recycler after washing.
15	33.1	Discarded plastics container	50	43.64	47.166	Stored in a secured manner and handed over to KSPCB authorized recycler after washing.
16	6.2	Zinc fines or dust or Ash or skimming in dispersible forms (Zinc dross)	40000	2565.06	2454.41	Sold to Authorised Recyclers
17	35.2	Spent Iron Catalyst	100	0	0	Stored in a secured manner and incinerated in captive incinerator
18	18.4	Chromium Sludge from Water Cooling Tower	300	104.47	88.01	Sent to Authorized TSDF for Pre-processing
19	36.2	Spent carbon or filter medium (Filters & filter materials which have organic compound)	150	40.64	22.73	Used back in Micro Pellet Plant
(b) From Pollution Control Facilities						
1	35.3	Chemical Sludge from Waste water treatment (ETP sludge)	12000	1082.12	1045.01	Used back in Pellet making

Sl. No	Waste Category	Waste generated	Consented Quantity MT/A	Generated Quantity MT/A 23-24	Generated Quantity MT/A 24-25	Mode of Disposal
2	35.3	Chemical Sludge from Waste water treatment (Impure sulphur)	1800	1227.89	1073.68	Stored in a secured manner and disposed to TSDF
3	35.3	Chemical Sludge from Waste Water Treatment (ZLD Salt)	6000	72.35	315.35	Sent to TSDF for landfilling at Bengaluru

Note: The Hazardous waste annual inventory returns along with manifest copies for FY 2024-25 is submitted to Karnataka State Pollution Control Board vide No: 332711 Dtd 08.08.2022

PART - E

SOLID WASTES

Generation and Utilization of Solid waste in MT/A

Category	UOM	Solid Waste FY'25		
		Generation	Utilisation	Location
Iron Making Slag	MT	4702479	4702479	Dry Pit Slag is sold to Cement Plant & Granulated Slag is Sold as Slag/Sold as sand
Steel Making Slag	MT	2716596	2716596	Sent to Micro Pellet Plant, Sent for Metallic separation & used back in the process, Sent to Base mix/Sent for PS balls making
Sludge	MT	462387	462387	Sent to Waste to Wealth Plant, Designated to MPP, Base Mix
Process Dust	MT	469908	469908	Internally used
Mill scale	MT	190721	190721	Sent to Base Mix
Fly Ash from CPP	MT	209009.02	209009.02	Fly ash based products (bricks), Cement manufacturing, Ready Mix Concrete, Ash & Geo-Polymer based construction material, Construction of roads, road & fly over embankment
% Utilisation	**100**			

Note:

Iron making slag constitutes Dry Pit Slag from BF-1,2,3,4; Corex 1,2 & Granulated Slag from BF-1,2,3,4; Corex 1,2

Steel making slag constitutes BOF Slag (SMS 1&2); EAF Slag (SMS 3)

Other wastes

Category	UOM	Total Quantity (During the previous financial year 2023-2024)	Total Quantity (During the current financial year 2024-2025)
E-waste	MT	21.89	64
Battery Waste	MT	243.71	81.21
Plastic Waste	MT	147.22	154.46
Plastic Waste (Category-II)	MT	50.70 (Import) 1525.63(Brand Owner)	
Other Hazardous Waste	MT	254.6	182.18

Note:

Note:

1. *JSW Steel Limited is registered as Importer and Brand owner under Plastic Waste Management Rules 2022 and its subsequent amendments for fulfilling the Extended Producer Responsibility for Plastic Packaging received/sent from the premises. As part of the EPR Compliance, the target for the FY 2023-24 is fulfilled during this FY and filed annual Returns in CPCB EPR Portal.*

Solid Wastes from Townships

Category	UOM	Total Quantity (2023-2024)	Total Quantity (2024-2025)
Municipal Solid Waste	MT	5840	6450
Horticulture Waste	MT	2190	2700

PART –F

CHARACTERISTICS OF WASTE

Generation, Chemical Composition and disposal of Solid Wastes

Sl. No.	Type of Waste	Typical Chemical Analysis (and size)	Mode of Utilization/ Disposal
Blast Furnace (BF)			
1	Blast Furnace Air Cooled Slag	CaO- 35.84, SiO2-32.78, Al2O3-17.82, MgO-6.59, FeO-0.66, MnO- 1.0, TiO2-0.89, Na2O-0.17, K2O-0.45, S-0.605	For Road making purpose as a sub base material.
2	Blast Furnace Granulated slag	CaO- 35.84, SiO2-32.78, Al2O3-17.82, MgO-6.59, FeO-0.66, MnO- 1.0, TiO2-0.89, Na2O-0.17, K2O-0.45, S-0.605	Selling to Cement Making Plants and as slag sand, an alternate of river sand.
3	Blast Furnace Flue Dust	Fe(t)-32.25;SiO2-2.96;Al2O3-4.57;CaO-3.25;MgO-1.42;TiO2-0.11;P2O5-0.11;SO3-0.66;Na2O-0.26;K2O-0.15;ZnO-0.99;LOI-39.04	Re-used in waste to wealth to recover Fe & C
4	Blast Furnace Sludge	Fe(t)-27.13;SiO2-3.91;Al2O3-4.31;CaO-4.76;MgO-1.64;TiO2-0.11;P2O5-0.11;SO3-0.69;Na2O-0.18;K2O-0.25;ZnO-0.64;LOI-44.26	Re-used in waste to wealth to recover Fe & C
5	Blast furnace bag filter dust	Fe(t)-57.03, Fe (M)-1.22, FeO-7.496, C-9.87, S-0.089;SiO2-1.06;Al2O3-0.039;CaO-6.90; MgO-0.83;TiO2-0.027;P2O5-0.006;Na2O-0.010;K2O-0.077;SO3-0.01ZnO-0.001	Reused in micro pellet plant, further to sinter making
Corex			
6	Corex Slag (Dry Pit Slag)	CaO- 35.84, SiO2-32.78, Al2O3-17.82, MgO-6.59, FeO-0.66, MnO- 1.0, TiO2-0.89, Na2O-0.17, K2O-0.45, S-0.605	For Road making purpose as a sub base material. c
7	Corex Granulated slag	CaO- 35.84, SiO2-32.78, Al2O3-17.82, MgO-6.59, FeO-0.66, MnO- 1.0, TiO2-0.89, Na2O-0.17, K2O-0.45, S-0.605	Selling to Cement Making Plants and as slag sand, an alternate of river sand.
8	Corex Coal Drying Plant Coal Dust	FC= 58-62%,Ash =10-13%,VM= 26-30%	Re-used in Blast Furnace for Pulverized Coal Injection (PCI).
9	Corex GCP Sludge	Sio2-8.74, Fe2O3-58.44, Al2O3-5.21, CaO-5.195, MgO-1.843,TiO2-0.190, Na2O-0.003,K2O-0.152, P2O5-0.238, C-18.278, S-0.455	Re-used in waste to wealth to recover Fe & C
10	Corex classifier sludge	Sio2-8.73, Fe2O3-52.70, Al2O3-5.855, CaO-7.26, MgO-2.47,TiO2-0.232, Na2O-0.002,K2O-0.183, P2O5-0.308,	Reused in micro pellet plant, further to sinter making
11	Corex bag house dust	Fe(t)-51.10, Fe (M)-0.43, FeO-2.18, C-3.11, S-0.118;SiO2-5.90;Al2O3-5.02;CaO-9.647; MgO-2.192;TiO2-	Reused in micro pellet plant, further to sinter making

Sl. No.	Type of Waste	Typical Chemical Analysis (and size)	Mode of Utilization/ Disposal
		0.176;P2O5-0.070;Na2O-0.061;K2O-0.098;SO3-0.106;ZnO-0.001	
Direct Reduced Iron (DRI)			
12	DRI sludge	Tfe % - 76.32 ; Mfe % - 44.90 ; Carbon – 1.55% ; Sulphur – 0.010, SiO2-7.02, Al2O3-3.58, CaO-1.7, MgO-0.224,	Re-used in base mix further to Sinter plant.
13	Product fines	Tfe % - 83.22 ; Mfe % - 76.31 ; Metz – 91.70 FeO – 8.91% ; Carbon – 2.78% ; Sulphur - 0.006.	Re-used in base mix further to Sinter plant
14	Oxide fines	Fe(T) – 63.64% , FeO- 1.61% , SiO2 - 3.51%, Al2O3 - 1.79%, CaO-1.74%, MgO-0.31%, MnO-0.05%, TiO2-0.15%, P – 0.033%, Na2O- 0.023%, K2O-0.216%, ZNO-0.003%, LOI-1.04%	Re-used in base mix further to Sinter plant
Steel Melting Shop – 1&2 (SMS-1&2 BOF)			
15	Fume Extraction System(FES) Dust	T.Fe – 30.46,Fe (M)- 2.4, FeO-6.32,CaO - 32.31%,MgO –5.707,SiO2 – 4.77%,Al2O3 – 2.07%, C- 5.84, S-0.632, P2O5-0.312,	Re-used in micro pellet plant further to sinter making
16	Mill Scale	Fe (T)-70.72,FeO-49.76, Fe(M)-10.06, C-0.240, S-0.007, SiO2-1.33, Al2O3-0.38, CaO-0.76, MgO-0.361, MnO-1.386, TiO2-0.026,P-0.029	Used for mill scale briquetting for further use in BOF as coolant
17	GCP sludge	Fe(T) – 67.10% ,Fe (M)- 34.75 FeO-34.51% , SiO2 – 2.38%, Al2O3 – 0.53%, CaO-13.02%, MgO-3.214%, MnO-0.084%, TiO2-0.057%, P2O5 – 0.114%, Na2O- 0.004%, K2O-0.158%, ZnO-0.061%, C-1.80%, S-0.093.	Re-used in micro pellet plant further to sinter making
18	Ladle Furnace(LF) Slag	Fe2O3-4.40, SiO2-3.27, Al2O3-35.0, CaO-42.0, MgO-9.90, MnO-1.95, TiO2-0.250, P2O5-0.110, K2O-0.015, Na2O-0.030,	Re-used in micro pellet plant further to sinter making
19	BOF slag	Fe2O3-23.0, SiO2-12.11, Al2O3-1.63, CaO-45.16, MgO-8.38, MnO-3.12, TiO2-0.580, P2O5-2.27, K2O-0.020, Na2O-0.003,	Used in micro pellet plant, blast furnace and sinter as source of flux, as scrap in BOF and bund construction
Steel Melting Shop - 3 (SMS-3 EAF)			
20	Fume Extraction System(FES) Dust	Fe2O3-68.60, SiO2-3.44, Al2O3-0.57, CaO-11.20, MgO-5.16, MnO-0.705, TiO2-0.065, P2O5-0.454, K2O-2.53, Na2O-1.01,	Used in mill scale briquetting plant further in SMS

Sl. No.	Type of Waste	Typical Chemical Analysis (and size)	Mode of Utilization/ Disposal
21	Electric Arc Furnace (EAF) slag	CaO – 28-32, MgO – 5 - 7,SiO2 – 14 -16, Fe – 20 - 24,Al2 o3 – 3 - 5,P2O5 – 0.5 - 0.8	Used as scrap in BOF and For Road making purpose as a sub base material & for making sub base of Inter plant railway network.
22	Ladle Furnace(LF) Slag	Fe2O3-4.40, SiO2-3.27, Al2O3-35.0, CaO-42.0, MgO-9.90, MnO-1.95, TiO2-0.250, P2O5-0.110, K2O-0.015, Na2O-0.030,	Re-used in micro pellet plant further to sinter making
23	Mill scale	Fe (T)-73.73,FeO-49.86, Fe(M)-12.35, C-0.243, S-0.007, SiO2-1.72, Al2O3-0.35, CaO-0.26, MgO-0.109, MnO-2.310, TiO2-0.043,P-0.043	Used for mill scale briquetting for further use in BOF as coolant
24	Combustion Chamber Dust	Fe (T)- 67.69, SiO2 -2.61, Al2O3-1.02, CaO-4.21, MgO-1.07, MnO- 0.026, TiO2-0.094, P-0.108, S-0.013, Na2O-0.048, K2O- 0.032, Total alkali-0.08, ZnO-0.001, Mfe-2.81, FeO-43.01	
Hot Strip Mill- 1&2 (HSM-1&2):			
25	Mill Scale	Fe (T)-69.84,FeO-57.16, Fe(M)-13.270, C-0.240, S-0.008, SiO2-4.17, Al2O3-1.17, CaO-3.25, MgO-0.477, MnO-0.354, TiO2-0.046,P-0.007, Na2O-2.083, K2O-0.023	Used for mill scale briquetting for further use in BOF as coolant
26	Sludge	Fe (T)-67.57,FeO-14.14, Fe(M)-0.52, C-0.71, S-0.010, SiO2-1.50, Al2O3-0.37, CaO-0.83, MgO-0.54, MnO-0.52, TiO2-0.016,P2O5-0.106, Na2O-0, K2O-0.018	Used for mill scale briquetting for further use in BOF as coolant
Wire Rod mill			
27	Mill scale	Fe (T)-73.75,FeO-59.68, Fe(M)-2.10, C-0.179, S-0.008, SiO2-0.6, Al2O3-0.11, CaO-0.15, MgO-0.080, MnO-0.627, TiO2-0.010,P-0.013,	Used for mill scale briquetting for further use in BOF as coolant
28	Sludge	Fe (T)-69.53,FeO-56.01, Fe(M)-0.009, C-2.14, S-0.031, SiO2-1.58, Al2O3-0.79, CaO-0.72, MgO-0.268, MnO-0.333, TiO2-0.023,P2O5-0.044,	Re-used in micro pellet plant further to sinter making
Bar rod mill			
29	Mill scale	Fe (T)-73.75,FeO-59.68, Fe(M)-2.10, C-0.179, S-0.008, SiO2-0.6, Al2O3-0.11, CaO-0.15, MgO-0.080, MnO-0.627, TiO2-0.010,P-0.013,	Used for mill scale briquetting for further use in BOF as coolant

Sl. No.	Type of Waste	Typical Chemical Analysis (and size)	Mode of Utilization/ Disposal
30	sludge	Fe (T)-69.53,FeO-56.01, Fe(M)-0.009, C-2.14, S-0.031, SiO2-1.58, Al2O3-0.79, CaO-0.72, MgO-0.268, MnO-0.333, TiO2-0.023,P2O5-0.044,	Re-used in micro pellet plant further to sinter making
Lime calcinations Plant :			
31	Dolo (Dolime) Fines	CaO: 51.31, MgO: 40.26, SiO2: 1.04, Al2O3: 0.23, Fe2O3: 0.26, LOI: 4.73	Re-used in CRM, Corex, and Sinter Plant.
32	Lime Fines	CaO: 93.12, MgO: 1.05, SiO2: 1.19, R2O3: 1.60, LOI: 3.89	Re-used in CRM, Corex, and Sinter Plant.
33	Bag house Fines (Lime/Dolo dust)	CaO: 38.86, MgO: 11.94, SiO2: 6.85, Al2O3-2.08, MnO-0.069, P2O5-0.076, LOI-35.77	Re-used in micro pellet plant further to sinter making
Refractory:			
34	Used Refractory Bricks	MgC birck MgO:97%, CaO:1.5%, Fe2O3:0.5%, SiO2:0.7%, Al2O3:0.2%, HA Brick Al2O3:70%, Fe2O3:3%	Sold to authorized recycler
35	Refractory Dust	MgO:75%, Fe2O3:3.6%, CaO:20%, SiO2:0.6%, Al2O3:0.3% Castable : Al2O3:85-90%, Fe2O3:1.5%, CaO:06%	Used in bund construction
Cold Rolling Mill (CRM-1&2) :			
36	Iron Oxide from Acid Regeneration Plant(ARP)	Fe2O3-98.21, SiO2-0.314, Al2O3-0.340, CaO-0.034, MnO-0.318,	Re-used in Mill Scale Briquetting Plant & PP-2.
37	Zinc dross	Recoverable Zn-85%, Impurities-15%	Selling to Authorized Recyclers/Re processor
38	Effluent Treatment Plant (ETP) Sludge	Fe2O3-39.81, SiO2-6.27, Al2O3-0.65, CaO-14.60, MgO-3.11, TiO2-0.030, Na2O-0.160, P2O5-0.810, LOI-33.07, C-14.95	Re-used in micro pellet plant further to sinter making
Coke Ovens			
39	CDQ dust	FC-85.34, VM-0.99, Ash-13.67	Re-used in micro pellet plant further to sinter making
Power Plant:			
40	Bottom Ash	Silica:41-42%, Aluminum Oxide: 20-22%, Iron Oxide: 5.04%, Calcium Oxide: 1.7 %, Magnesium Oxide: 0.94%, SO2+SO3: 0.54%, Na2O+K2O: 0.92%, Titanium	Used for bricks manufacturing

Sl. No.	Type of Waste	Typical Chemical Analysis (and size)	Mode of Utilization/ Disposal
		Oxide: 0.44%, Phosphorus Pentoxide: 0.32%, Loss of Ignition: 29.82%	
41	Fly Ash	Silica:50-55%, Aluminum Oxide: 20-25%, Iron Oxide: 6.22%, Calcium Oxide:1.5-2%, Magnesium Oxide: 0.2-0.3%, SO2+SO3: 0.48%, Na2O+K2O: 0.975%, Titanium Oxide: 0.18%, Phosphorus Pentoxide: 0.24%, Loss of Ignition: 14.23%	Sold to Cement Making

Other Wastes

Category	UOM	Disposal
E-waste	MT	Sent to Authorised E-waste recyclers/vendors
Battery Waste	MT	Sent to Authorised Battery waste recyclers/vendors

PART – G

IMPACT OF THE POLLUTION CONTROL MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES

CONSERVATION OF NATURAL RESOURCES

➢ WATER ENVIRONMENT

JSW receives water from Tunga Bhadra (TB) Dam and Almatti Dam. Our Vijayanagar plant has launched a comprehensive water stewardship initiative aimed at maximising effluent treatment and increasing the use of treated water from water treatment facilities and sewage treatment plants. This approach includes immediate actions and long-term technological advancements to conserve and recycle water resources. Currently, our efforts are focused on enhancing water treatment capacity by auditing Existing RO Plants and increasing the use of treated water from RO and from sewage treatment plants. This includes reusing secondary water and minimising process losses. We are addressing water leakage and seepage to prevent wastage and improving RO system efficiency. We are also implementing measures to maximise recycling from guard ponds. Process effluents are collected and settled in three separate guard ponds, with the water reused in secondary processes and horticultural activities. RO plants have been installed at various sites to efficiently reuse and recycle process effluents, significantly decreasing freshwater use. Sewage water is treated through our sewage treatment plant and utilised for process operations in CRM – 2, RO feed and horticultural purposes. To optimise wastewater discharge, we are minimising discharge and maximising recycling. This involves improving the Cycles of Concentration (CoC) in our cooling towers to reduce wastewater blow down, lowering filter backwash frequency, and increasing the use of guard pond water in processes. Desilting of guard pond 1 and 2 has enhanced its capacity and supporting increased secondary usage. Going forward, our short-term goals include streamlining processes for efficient water use, implementing advanced RO technology for better water treatment, and expanding guard pond capacity for maximum water retention. Through continuous innovation and a holistic approach to water stewardship, we aim to set new standards in responsible water management within the industrial sector, safeguarding valuable resources for future generations.

Water Pollution Control Measures implemented:

JSW Steel adopts a structured management approach, awareness, and technological intervention, to not only conserve water but also provide safe and steady water resources for industrial as well as human use within its operations. The Company has taken extensive initiatives in this direction.

JSW Steel Limited has been conserving water through following interventions in FY24-25:

1. Enhancing capacity utilisation of RO plants has increased water availability by 1,071 m3/day.

2. Chemical Pyrophosphate dosing in cooling towers to increase the COC in BF-3&4 Water savings of 530 m3/da.

3. Further, to ensure Zero Discharge from the premises we have taken the following measures:-

(i) We have provided individual water treatment units at major water intensive shops. The treated water is recirculated back into the process. All the process units are equipped with the extensive water recirculation system with treatment facility (ETP), i.e. Clarifier / Thickener, Pressure Filters and cooling tower to recirculate water back to process.

(ii) The remaining treated water meeting stipulated standards as per Schedule – 6 of EP Act, 1986 are collected in guard ponds. We have 3 no. of Guard Ponds

(a) Guard Pond- 1 with capacity 1,25,000 (m3),

(b) Guard Pond-2 with capacity 1,25,000 (m3) and

(c) Guard Pond – 3 with capacity 20,000 (m3) respectively.

(iii) The water collected in guard ponds and again reused internally for secondary purposes in processes like Pellet Plants, sinter plants, Coke Oven Batteries for moisture addition purposes, as Makeup water of Ore Beneficiation Process, Fire-fighting circuit and Dust suppression at various units, Vehicle washing, slag quenching and green belt development inside the plant premises, Townships and in surrounding hillock regions.

(iv) The guard ponds are de-silted/rejuvenated periodically and their water holding capacity restored. This Financial Year Guard Ponds are de-silted and rejuvenated and maintenance work of pumps and pump houses has been undertaken and the ponds are taken online for storage. This will ensure that there is no over flow form the Guard Ponds.

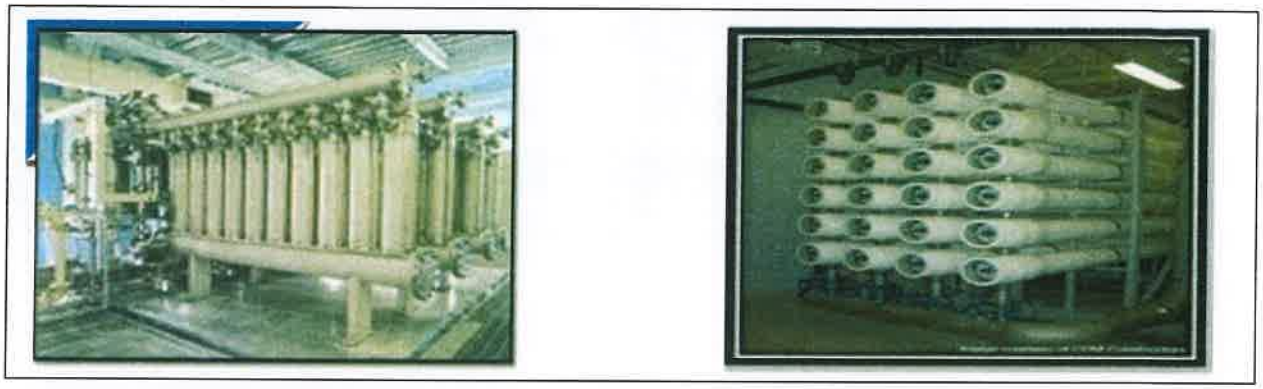
(v) We have taken special measures for reducing the water flow towards the Guard Ponds, by ensuring the operation of Individual water treatment units.

(vi) Recycling of water up to 40,000 -45000 m3/day in non-critical applications through all the guard ponds.

Slime Recovery Plant RO	1 No (9000 m^3/Day)

Recycling of water up to 40,000 -45000 m^3/day in non-critical applications through all the guard ponds.

Water Pollution Control Systems in JSW Steel



Ceramic Membrane
First in World

RO Plant

Guard Pond

ZLD Plant at Coke oven
First in World

Membrane Bio-reactor

CRM 1 RO

WRM 2 RO

The following Sewage Treatment plants were implemented at town ship and the treated sewage was ZLD at Coke ovens recovered and reused.

Evoporator – ZLD

8 nos of RO Plants producing 23,700 m3/day

Water and Effluent Management		
 MBR+RO+ZLD plant at Coke Oven (4000 m3/d)	 8 nos of RO Plants producing 23,700 m3/day	 Multiple Effective Evaporator for ZLD plant
 Raw water reservoir (35 Mn m3)	 CO2 injection system at SMS	 Rapid Clarifier System

Reverse Osmosis Plant Capacities Details:-

Sl. no	Location	Capacity (m3/day)	Feed source
1	HSM #1	2200	Guard pond-1, HSM1, CRM1, SMS1
2	JSWEL	4050	JSWEL
3	Coke oven 3&4 ZLD	4300	Coke oven
4	CRM #2	6900	CRM2, HSM2, Shankar Hill town & VV Nagar STP
5	DRI	2400	DRI, SMS3, BOC
6	BRM-2	850	BRM2
7	CRM-1	2000	CRM1
8	WRM2	1000	WRM2
Total capacity		23700 m3/day	

1. We have installed and operating RO plant with capacity 9000 m^3 at Slime Recovery Plant for treatment of Seepage water and the same after treatment is collected in permeate tank and reused in Ore beneficiation plant and other process operations.
2. Further for treatment of domestic sewage from plant and townships we have provided 7 No of STPS's with water treatment facility of 8780 m3/day. The treated water is reused for secondary purposes in townships, process water in CRM units and for Green belt development in plant premises and in the surrounding regions.

The following Sewage Treatment plants were implemented at township and the treated sewage was recovered for process as a makeup water

Sl. no	STP Location	Capacity (m3/day)	Technology/ Recycle & Reuse
1	Vidyanagar	1500	MBR upgraded from FAB. Recycled to 5 MTPA process and Green belt
2		1000	Reed bed. Reused for Green belt
3	VV Nagar	1200	SAFF technology Recycled in CRM-2 process through ETP and R.O plants
4	Shankar Hill town	3000	MBR Technology. Recycled in CRM-2 process through R.O plants
5	Hill Side Township	1560	MBR Technology. Recycled to 5MTPA process and Green belt
6	Lake view	400	MBR Reused for Green belt
7	Sun rise Valley	120	MBR Reused for Green belt
Total capacity		8780 m3/day	

1. We have provided 3 No of Rain Water harvesting ponds with overall with water holding capacity of 3,97,22,000 m^3. Due to incessant rain the rainwater ponds have reached its capacity.
2. We have installed water flow meter and Continuous Effluent Quality Monitoring system (CEQMS) at discharge points of Guard Ponds for the continuous monitoring of the Flow and pH. The same is connected to KSPCB/CPCB Portals and data being uploaded regularly.
3. In addition to this, we are conducting manual monitoring of the effluents through NABL accredited laboratory to assure the effluents are meeting stipulated norms and results of the same are being submitted regularly.
4. During rains, the water holding capacity of Guard Ponds may get saturated and overflow after retention time meeting the stipulated standards may flow into surrounding region. To ensure compliance we have taken up de-siltation of guard ponds periodically. The recent de-siltation being done in the month of Jan to March 2025.
5. Provided pipe line from Plant to nearest mines to consume excess treated blow down from Guard ponds for Dust suppression & Horticulture.

➢ AIR Environment

In an integrated Steel Plant, dust emissions are the major air emission concerns. Various efforts to control the particulate (dust) stack emissions have resulted in reduction of emissions to 0.41 kg/tcs in 2024-25. The reduction was possible by carrying out capital repairs of ESP at Pellet and sinter plants. We have taken extensive air pollution control measures in the plant to control the dustemission.

The details of Air pollution control measures implemented are as follows:

a. Installation of 7 MT JNT-1 DDS 3,20,000 m3/hr and Installation & commissioning of 7 MT JH-12 DDS 2,80,000 m3/hr in FY24-25 has outcome in control of fugitive emissions.
b. The following Air pollution control system to meet the emissions.

Air Pollution Control Equipments	Nos
Electrostatic Precipitators	11 Nos
Bag houses	281 Nos
Scrubbers	30Nos
Wind Curtains	3.5 Kms
Dry fog systems in Junction Houses of Raw Material Handling systems RMHS	180s

c. High efficiency ESPs/ Bag filters in Pellet Plant, up gradation of SMS 1 & SMS 2 secondary dedusting.
d. Installation of Charging emission control by SOPRECO (Single Oven Pressure Reduction in Coke Ovens)
e. Installation of Emission reduction via MEROS (Maximum Emission Reduction of Sinter)

in Sinter Plant

f. Dry fogging and bag filter based Dust Extraction system in material handling
g. Control in Charging and pushing Emission in Coke Ovens
h. Installation of Low NOx stage combustion burners in HSM
i. Installation of dust suppression system for conveyors FC1, FC2 to reduce work area emissions
j. Installation of mist canons for blast furnace stock house and JH14-15

Mist Canon for blast furnace stock house and JH14-15

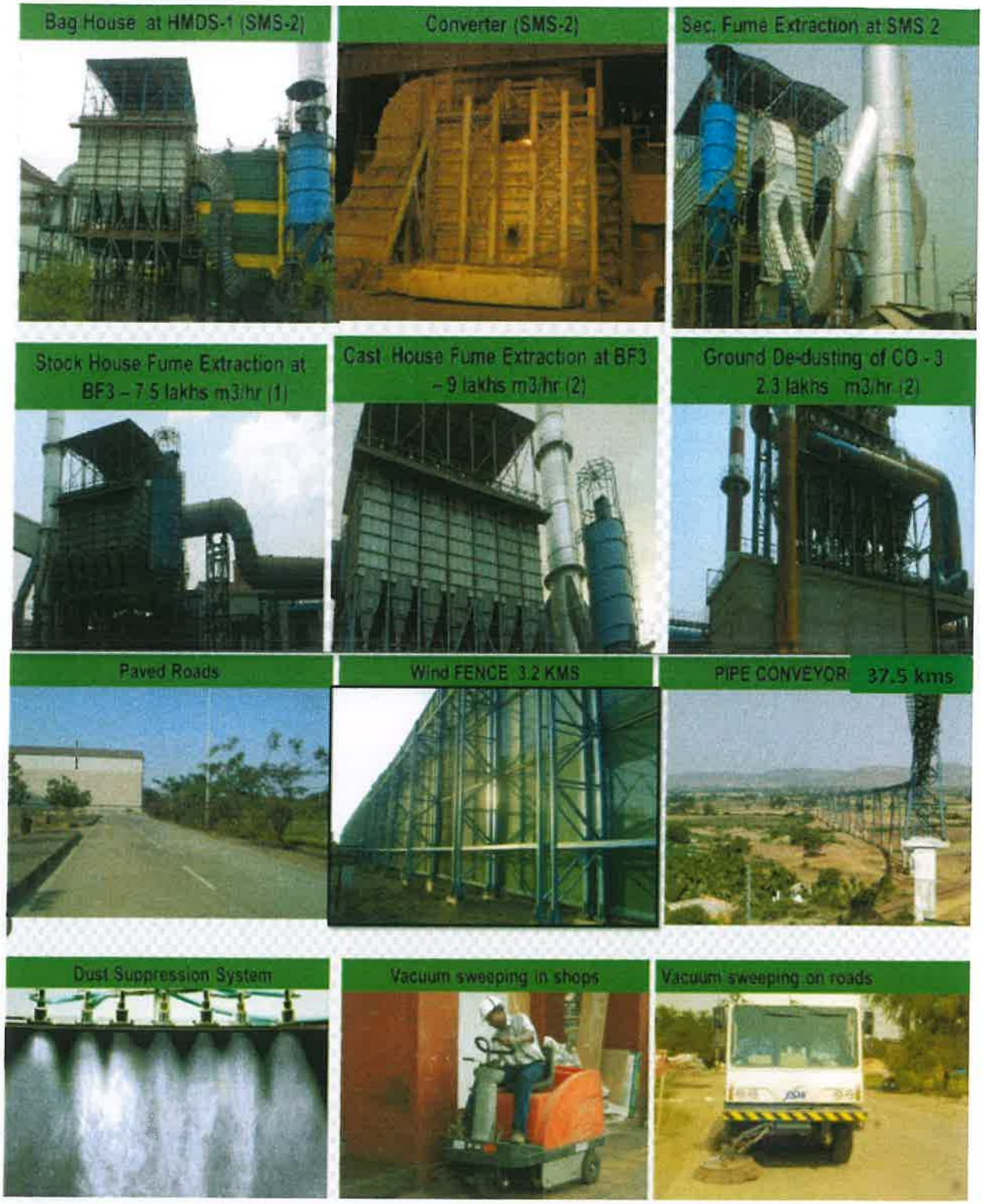
k. In addition to the above all the internal roads have been paved and concreted and tree plantation done on either sides of the road
l. Vacuum sweeping of the roads and road wetting is done on regular basis.
m. Vacuum sweepers are being operated in the shop floors to capture all fugitive dust.
n. Source mounted dedusting unit installed for a moving stacker-reclaimer unit at Raw Material Handling System
o. Dust suppression nozzles installed for RMHS junction house JH 9A– In-house developed

Source mounted dedusting units for SR4 - RMHS

Before (10AC1) 5J9AC1 After 10 AC1

Dust suppression nozzles for JH 9A - RMHS

With the above air pollution control measure in place air quality impact on the surrounding villages is minimal



C. SOLID WASTE MANAGEMENT

- Collection and reuse of steelmaking slag that has resulted in Post metal recovery, used as coolant in steelmaking and redirected for use in the micro pelletisation plant.
- KR Slag consumption at base mix has resulted in Achieving 1,608 TPD of total consumption.
- JSW Vijayanagar has taken a significant step towards sustainable steelmaking by replacing limestone with LD slag, a by-product of the Steel Melting Shop, in its blast furnace operations. Traditionally used as a flux, limestone combustion releases CO2, and its mining exacerbates environmental degradation. Likewise, LD slag's disposal and storage can prove particularly challenging, often leading to unsustainable land use. After detailed analysis, it was established that 2 kg of LD slag could replace 1 kg of limestone without compromising furnace performance. The utilization of LD Slag in Pellet Plant 1 leading to the reduction of raw flux consumption.
- SMS-4 dust is now being consumed in both Sinter Plant 1 and Pellet Plant 1.
- Reduction in Conveyor belt consumption costs at Pellet Plant 1 through the implementation of best practices
- Yield improvement in Wire Rod Mill-1, Bar Rod Mill 1 & 2.
- Fly ash usage commenced at Pellet Plant 1 helping to lower bentonite consumption.
- Application of waste glass wool in concrete to improve flexural strength outcome in Piloting the use of waste glass wool as a fiber reinforcement in concrete to enhance its tensile capacity and overall strength, within optimised dosage limits.

PART – H

ADDITIONAL MEASURES / INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION

Proposed Investment (2025-26) for environment protection in JSW Steel Limited (Capex 25-26)

S.No.	Project Title	Budget (Rs. in Crs)
1	Monitoring & Reporting	80.3
2	Water Saving/Effluent/Sewage treatment - Own	42.5
3	Air Pollution control-Own	130.0
4	Waste Management - Reduce/Recycle/Reuse	27
Grand Total		**279.8**

Environmental initiatives

- Installed and commissioned in-house source mounted De-Dusting System(DDS) at PP1 (Pellet Plant 1) to reduce dust emissions from the conveyor.
- 500 KLD (Kilo Litres per Day) Sewage Treatment Plant (STP) plant commissioned to treat and reuse sewage generated within the plant (office & canteen) and treated sewage water is reused in steel melt shop 3 for secondary application there by reducing its water requirement.
- Installed a dust suppression system in Junction House (JH) 7 & 8 of RMHS (Raw Material Handling System) and a DDS at JH-12 which resulted in reduction of Fugitive Emission.
- Noise study carried out in Agglomeration units to monitor high/critical noise sources.
- 199.5 Crores have been invested towards the protection of environment.
- We are using renewable energy from Solar and Wind sources for steel making. This has resulted in reduction of 6,51,028 tCO2 for the Current FY 2024-25 and this principal activity is producing 26% of renewable energy.
- Charging of external purchased scrap in SMS Plants. This has resulted in the reduction of 72,375 tCO2 for the Current FY 2024-25.
- Enabling zero steam in blast furnace 2 & 4 leading to the reduction of 66,193 tCO2 for the Current FY 2024-25.
- Enhancing process efficiency by reducing minimum valve flaring with smaller control valves in BF4 resulting in the reduction of 61,792 tCO2 for the Current FY 2024-25
- Increased HBT (Hot Blast Temperature) in BF3 leading to the reduction of 43,413 tCO2 for the Current FY 2024-25

- Increased use of LD slag leading to the reduction of 43,219 tCO2 for the Current FY 2024-25
- Centre coke charging at BF4 resulting in the reduction of 20,250 tCO2 for the Current FY 2024-25
- Heat balancing in pelletisation process resulting in the Energy savings of 3,78,833 Gcal for the Current FY 2024-25
- Zero steam usage in blast furnace 2 & 4 leading to the Energy savings of 1,89,916 Gcal for the Current FY 2024-25
- Increased HBT(Hot Blast Temperature) in all blast furnaces leading to the Energy savings of 78,206 Gcal for the Current FY 2024-25
- Stove heat optimisation modelling in BF1 with Energy savings of 53,929 Gcal for the Current FY 2024-25
- Centre coke charging in blast furnace 4 with Energy savings of 48,642 Gcal for the Current FY 2024-25
- Optimising steam consumption (CRM1) leading to the Energy savings of 10,072 Gcal for the Current FY 2024-25
- Enhancement of the green belt in collaboration with forest department at Daroji Reserve Forest, this Initiative resulted in the planting of 22,450 saplings across 50 hectares, including 2,000 fruit bearing and bamboo plants, significantly enhancing green cover, biodiversity, soil stability, and sustainable resource availability for the local community.
- Tree Plantation for improving Overall biodiversity index, this initiative resulted in the Plantation of 21.78 lakhs trees at JSW complex Vijayanagar Works till March 2025
- JSW Steel Limited is procuring Solar and wind renewable energy through JSW Renewable Energy Private Limited. 54.86 MW per day is consumed from Solar Farms and 38.25 MW per day is consumed from Wind Mills. Overall 815972 MW of renewable energy is procured from JSW Renewable Energy Private Limited for the FY 2024-25 as part of as part of Green Initiative/CO2 emission reduction initiative.
- JSW Steel Vijayanagar Works in Karnataka has introduced an 800 kW battery-powered locomotive as a major sustainable transport achievement as a part of Green Initiative/CO2 emission reduction initiative.
- JSWSL has provided 71 electric buses and 59 electric cars as part of Green Initiative/CO2 emission reduction initiative for commuting of employees from Ballari, Hosapete, townships and within the plant.
- Captive Power Plant with a capacity of 300 MW Coal + Gas based is installed.
- 2 units of Coal Briquetting Plants are installed with a capacity of 0.3 MTPA
- 100% recycling of all waste generated from operations.
- Bio Gas Plant is installed with a capacity of 1 TPD

- Batch Mixing plant of 500m3/hr is installed
- BOF Slag crushing plant of 80000 TPM is installed.
- MSW Plant is installed with a capacity of 10 TPD (Refuse Derived Fuel) is installed where Municipal Solid Waste is collected.
- Steam-free steelmaking drive - At Vijayanagar, we have taken a decisive leap in sustainable iron making with the rollout of our "Zero Steam" initiative across blast furnaces. Traditionally, steam was injected to facilitate burden softening and manage gas flow, but operational diagnostics showed this practise disrupted the thermal balance, increased coke usage and elevated CO2 emissions. Through advanced thermal profiling, real-time monitoring and fine-tuning of oxygen enrichment, burden distribution and blast parameters, JSW eliminated steam injection in BF-2 and BF-4, saving approximately 8 kg of CO2 per tonne of crude steel.
- We are also in the process of installing 600MW of wind power at Vijayanagar, which includes 205 turbines. This addition will bring the combined solar and wind capacities at Vijayanagar to 825 MW. 782 MW has already been commissioned at our operations.
- In partnership with the District Forest Department, JSW Foundation led a large scale tree plantation initiative at Kurekuppa's Daroji Reserve Forest, planting 2.5 million saplings across 50 hectares, sequestered 3,50,000 tonnes of CO2 (estimated). Reinforcing its long term commitment, JSW Foundation signed an MoU with the Karnataka Forest Department to conserve the Daroji Foreshore and Toranagallu Reserved Forests, critical ecosystems near our operations. This partnership ensures the preservation of 6,227 hectares of greenbelt, aligning with broader goals of biodiversity conservation, climate resilience, and sustainable development.

- As part of CSR program, initiatives are focused in the following areas such as Environment, Waste Management, Water Management, Project Bunkai (Preservation and revive culture of Handloom Weaving) and Plastic Reuse

- The activities under Environment as are follows:
  (i) The Botanical Garden was developed in 3 acres at VSK University
  (ii) Conservation of Reserve forests
  (iii) Enhance the green belt in collaboration with the forest department
  (iv) Total plantation done – 114210
  (v) Light house initiatives: ODF ++ (4GPs)
  (vi) Support for model Villages.

- The activities under the waste management programme as follows:
  (i) The solid waste management program in Vaddu, Basapura, Talur, Toranagallu, Toranagallu RS, and Kurekuppa focuses on educating residents about the waste segregation, implementing door-to-door collection, and setting up sorting and recycling systems.
  (ii) Wet, dry and hazardous wastes are managed separately, with recyclables sent to sorting centres and non-recyclable to cement plants.
  (iii) The program promotes sustainability, reduces waste at the source, and involves local training and community participation to ensure long-term success and environment responsibility.
  (iv) The total no. of Villages/ towns covered under this initiative are 10, families covered are 21297.

- Rain harvesting and conservation initiatives undertaken through the following initiatives such as
  (i) Construction of check dams
  (ii) Check dam repairs
  (iii) De silting of Naala
  (iv) Construction of Farm Ponds
  (v) Roof rainwater harvesting structure
  (vi) Water user committees
  (vii) Water awareness camps – 25 villages
  (viii) Water purification – 15 villages

- Special initiative called Project "Sakhi" which focuses on the upcycling of Used Plastic. The activities under this programme are as follows:
  (i) Project Sakhi was initiated to mainstreaming women form vulnerable community who have been identified, counselled and trained on high quality bag manufacturing through single use plastic upcycling.
  (ii) 29.29 lakhs single-use plastic bags were upcycled to make 21754 fabric sheets.
  (iii) No. of products manufactured under this initiative are 10211.

- We have banned SUP within the plant premises and have a created awareness among the employees. Only glass bottles are used for drinking water.
- Initiatives under Project Bunkai are:
  (i) Women are trained in different techniques of weaving like Jamdani and Tandaliya, New products in category of Apparels, Stoles and Home furnishings have been created

(ii) Participants in Kala Ghoda Arts Festival, Mumbai and for exposure on the materials

(iii) Launch of products on Gocoop.com, an online platform

(iv) Fabric Production is 3000+ Mitres.

- The employees are commuting to work through EV Buses and Electric Cars are used by transportation department for commuting locally and over long distances.
- We have maintained Green belt of 33%, by planting overall 21.78 Lakhs trees till date including gap plantation

PART – I

MISCELLANEOUS

1. Key Performance Indicators:

The key environment performance parameters for Iron & Steel industry is being measured for benchmarking with best practices in the industry. Though, there are no regulatory norms, these parameters provide a guide for overall improvements. The KPI for 2024-25 is given below:

Key Performance Indicators	
Year	**2024-25**
Parameters	
Specific water consumption (m^3/tcs)	2.36
Dust emission (kg/tcs)	0.41
SO_2 emission (kg/tcs)	2.05
NO_x emission (kg/tcs)	1.20
Solid Waste Utilization (%)	100
Specific Energy Consumption (Gcal / tcs)	5.87