



Ref. No. FAP(B)/HEAD/ 627 /2015

Date : 29.09.2015

To

The Member Secretary
State Pollution Control Board
Paribesh Bhawan, A/118, Nilakantha Nagar,
Unit - VIII, Bhubaneswar - 751012

Sub : Submission of Environmental Statement for Financial Year 2014-15.

Sir,

With reference to the subject cited above, one set of environmental statement for financial year 2014-15 is enclosed for your kind perusal.

Thanking you,

Yours faithfully,
For TATA STEEL LTD.

Head, FA Prodn.
FAP, Bamnival

Encl : as above.

Copy to : Regional Officer, OSPCB, At-Baniapat, College Road, Keonjhar -7580 01
with enclosure.

etc

TATA STEEL

Ferro Alloy Plant, Bamnival-758082, Keonjhar, Odisha, India
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Regd. Office : Bombay House, 24 Homi Mody Street, Mumbai-400 001
Tel. : 91 22 6665 8282 Fax 91 22 66657724
Corporate Identity Number L27100MH1907PLC000260 Website www.tatasteel.com

ENVIRONMENTAL STATEMENT

OF

**FERRO ALLOYS PLANT
(TATA STEEL LIMITED)**

BAMNIPAL, KEONJHAR

FOR THE YEAR 2014-2015

**PREPARED BY
THE DEPARTMENT OF SAFETY & ENVIRONMENT**

FERRO ALLOYS PLANT

TATA STEEL LIMITED

BAMNIPAL, DIST. KEONJHAR

INTRODUCTION

The Ferro Alloy Plant, Bamnival unit was originally set up by M/s ORISSA MINING CORPORATION LTD. (OMC) (A GOVT. OF ORISSA UNDERTAKING) in 1986, under Technical Collaboration with Consortium Voest Alpine AG (Linz, Austria) and Outokumpu OY, ESPOO Finland. The Plant adopts the OUTOKUMPU process of manufacturing sintered chrome ore pellet and production of Ferro Chrome by Electro Thermic Reduction in Sub-Merged ARC-FURNACE.

The Plant was taken-over by "TATA STEEL" under an agreement with GOVT. OF ORISSA on 27th SEPT'91. The earlier marketing agreement with M/s KLOCKNER AG, WEST GERMANY ceased to exist w.e.f. the date of take over by TATA STEEL.

It is obvious that the economic development of a nation rests on the extent of industrialization it has. With the advent of the Industrial Revolution, the global economic growth has assumed staggering proportion. But simultaneously this phenomenon has substantially impeded the preservation of flora and fauna which is imperative for human existence. Indiscreet exploitation of natural resources has resulted in gross environmental degradation. So, to help preserve the natural habitat, the Government has enacted various laws in order to bridle the environmental pollution caused by the industries.

M/s TATA Steel Ltd. has always supported the cause of environmental protection and has adopted environmental measures both in letter and spirit. The Environmental Audit Report, a topic notified on the 13th March, 1992 as an outcome of the amendment of the Environment (Protection) Rules, 1986, is basically an annual status report of an industry as regards the environmental measures adopted by the industry to protect and improve the work environment and the periphery.

FORM - V

Environmental Statement for the financial year ending on 31.3.2015

PART - A

1. Name and address of the owner/ occupier of the Industry, operation or process : Ferro Alloy Plant, Bamnival
Tata Steel Ltd,
At /PO- Bamnival, Keonjhar-758082
- Factory Manager : Mr. U P RATH
Head, Ferro Alloys Production,
- Nominated Occupier : Mr. T.V Narendran,
Managing Director
Tata Steel Ltd, Jamshedpur
2. Industry Category : Large
3. Production Capacity of Ferro Alloys. : 65,000 MT/Year
4. Year of establishment : 1986
5. Date of submission of previous Environmental Statement : 19TH September.2014

PART - B

Water and Raw Material Consumption

- Water Consumption - Water is used inside the Plant for the following purpose
- a) Industrial Cooling
 - b) Process and
 - c) Domestic Purpose

Water consumption under all the three heads for the assessment year are as follows:-

1. Industrial Cooling : 371172 M3
2. Process : 226677 M3
3. Domestic : 190546 M3

Process water consumption per unit of product out put :-

Name of the Product(s)	Rate of water Consumption in M3/T	
	During FY 13-14	During FY 14-15
High Carbon FeCr	23.53	23.81

B. Raw material Consumption :-

The raw material consumption for the production of FeCr are as follows:-

FeCr :

Raw Materials Used	Avg quantity used to produce 1 MT of FeCr for the Previous Year(2013-14)	Avg Quantity used to produce 1MT of FeCr for the current year(2014-15)
Chrome Ore (Kg)	2226	2116 *
Coke (Kg)	556	534*
Electrode Paste (Kg)	8	8*
Power (KWH)	3404	3404*

*Annual average

PART - C

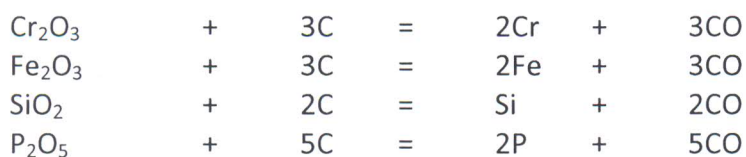
Pollution discharged to environment / unit of output

(Parameter as specified in the Consents issued)

Basically the plant produces air pollution and the causes can be attributed to the process which has been briefed as follows:-

Brief description of the process producing FeCr :

During the smelting process, oxides of Chromium, Iron, Silicon, Sulphur and Phosphorous are reduced and the reactions involved in the above process are as follows:-



The Sulphur goes into the Slag and also escapes to the atmosphere through the stack as SO₂.

Sources of Pollution:

The sources of pollution can be in the form of:

1. Air Pollution
2. Water Pollution

Air Pollution:

30 MVA Arc Furnace produces the following air pollutants which is released to atmosphere through GCP.

SPM, SO₂, NO₂ & CO

Water Pollution:-

The water used for cooling several parts of the Furnaces, making slurry in GFPS, slag granulation, scrubbing in GCP is re-circulated to the system and is not discharged outside the Plant.

DETAILS OF THE ENVIRONMENTAL MONITORING

Stack Emission Quality:

	Type of Air pollutant	Concentration of pollutants in $\mu\text{g}/\text{m}^3$ <i>mg/Nm³</i>	Prescribed standard in $\mu\text{g}/\text{m}^3$ <i>mg/Nm³</i>	% variation from the norms with reason.
Stack attached to Arc Furnace	PM	65 (max)	100	35 % (due to the effective operation of Gas Cleaning Plant)

AMBIENT AIR QUALITY:

TYPE OF AIR POLLUTANTS	CONCN.OF POLLUTANTS IN $\mu\text{g}/\text{m}^3$	PRESCRIBED STANDARDS IN $\mu\text{g}/\text{m}^3$	% OF VARIATION FROM THE NORMS WITH REASONS
PM ₁₀	39	100*	
PM _{2.5}	19	60*	Due to effective water Sprinkling on haul roads and DE system in GFPS (Grinding Filtering Pelletizing Plant)
SO ₂	5	80	
NO _x	10	80	
CO	NT	2 mg/m ³	The CO gets diluted in the air immediately

*Annual average

** in mg/NM3

NT-Not tracable

Details of Water Quality Monitoring:

Pollutants	Conc. of Pollutants (mg/ltrs.)	Standards (mg/ltrs.)	% of variation from standards with reasons
pH	7.82	5.5-9.0	--
TSS	50.52	100	-49.48%
Oil & Grease	4.6	10	-53.86%
BOD	2.76	30	-90.8%

COD	9.05	250	-96.38%
Cr+6	0.058	0.1	-41.90%
Total Cr	0.2	2	-85.30%
Iron	0.6	3	-77.86%

PART - D

HAZARDOUS WASTES

(AS SPECIFIED UNDER THE HAZARDOUS WASTES)

HAZARDOUS WASTES	TOTAL QUANTITY	
	DURING THE PREVIOUS YEAR (2013-14)	DURING THE CURRENT YEAR(2014-15)
I) FROM PROCESS		
a. Used Oil	a) 1970 Ltrs*	e) 1800 Ltrs*
b. Waste Containing Oil	b) Nil Ltrs	f) Nil Ltrs
c. Waste batteries	c) 03 Nos* (Including Telephone exchange batteries)	g) 13 Nos* (Including Telephone exchange batteries)
II) From Pollution Control Facility (GCP)	d) 136 Mt (as sludge)	h) 70 Mt (as sludge)

* Including Back log

PART - E

SOLID WASTES

SOURCES	TOTAL QUANTITY	
	DURING THE PREVIOUS YEAR(2013- 2014)	DURING THE CURRENT YEAR(2014- 2015)
a. From Process		
i) Slag	39,805 MT	27616 MT
ii) Cotton wastes	Nil (The use has been stopped completely)	Nil (The use has been stopped completely)
iii) Waste Batteries	03 Nos* (Including telephone exchange batteries)	13 Nos* (Including telephone exchange batteries)
b. From Pollution Control Facility.	136 MT (As sludge)	70 MT (As sludge)

c. i. Quantity recycled or Reused within the unit	NIL	NIL
ii. Quantity sold	Nil	Nil
iii. Quantity disposed	Slag dumped in our company leased area and sludge stored in impervious lined pit.	Slag dumped in our company leased area and sludge stored in impervious lined pit.

* including backlog

PART - F

Characteristics of FeCr Slag	Characteristics of GCP Sludge
Cr ₂ O ₃ = 7% to 10%	Cr ₂ O ₃ = 25% to 28%
SiO ₂ = 28% to 32%	SiO ₂ = 17% to 18%
MgO = 25% to 28%	C = 7% to 8%
Al ₂ O ₃ = 25% to 28%	Al ₂ O ₃ = 10% to 12%
Fe ₂ O ₃ = 3% to 4%	CaO = 2% to 4%
CaO = 1% to 4%	MgO = 16% to 18%
	FeO = 11 to 12%

The composition of other hazardous wastes like Waste Oil & Waste Batteries is Hydrocarbons, lead and used acids.

DISPOSAL PRACTICE:

SLAG:-

Slags generated from furnace are dumped in our leased area.

SLUDGE:-

The sludge after being conveyed to the imperviously lined sludge drying beds from the thickener is allowed to dry sufficiently and the dry sludge is then transported to the earmarked sludge dumping site inside the plant premises. We have already set up a briquette plant and trying to use this sludge in small proportion.

WASTE OIL :

The waste oil generated at various sources is collected in leak proof barrels and then are kept on an impervious floor with oil catch pit. It is also ensured that the caps of the barrels remain intact and horizontal. The storage area is properly fenced and caution board displayed. During transfer of waste oil to barrels, a trough is placed underneath in order to prevent land contamination due to oil spillage. Then at a fixed interval, these barrels are

returned to stores for final disposal through auction to the authorized recycler after due intimation to State Pollution Control Board. After dispatch of same, intimation of auction along with copy of manifest is also being sent to State Pollution Control Board.

WASTE BATTERIES :

Waste Batteries are generated in Electrical section and Garage. These batteries with diluted acid and caps intact are kept under a shed having impervious floor. Then at a fixed interval, these batteries are returned to Stores for final disposal. All storage areas are having sheds have been suitably barricaded and caution board displayed. Then at a fixed interval, these batteries are disposed through auction to the authorized recycler after due intimation to State Pollution Control Board. After dispatch of same, intimation of auction along with copy of manifest is also being sent to State Pollution Control Board.

PART - G

IMPACT OF THE POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTION:

M/s Ferro Chrome Plant has spearheaded the pursuit for Environmental Protection by implementing an effective environmental management system. To this effect, the Plant has undertaken the following measures:-

- i. Installation of two wet scrubber type Gas Cleaning Plants at cost of more than 5 crores. Annual maintenance of both the GCPs including power consumption and sludge transportation is 1.10 crores (approx).
- ii. Engineering landfill development by impervious lining of sludge pond with HDPE Geo membrane (1.5 mm thick) as per OPCB guides line to prevent ground water contamination. It costs around 50 lakhs.
- iii. Extensive Plantation in and around the Plant for which the annual expenditure of Rs. 7.65 lakhs was incurred.
- iv. Rs 4.10 lakhs every year for water sprinkling on haul roads.
- v. Environmental Monitoring & measurement every month by third party at a cost of Rs. 14.54 lakhs.
- vi. Miscellaneous contracts of Rs. 18.26 lakhs for garden maintenance, house keeping, dust cleaning etc.
- vii. Development of nursery of Rs.10.5 lakhs.
- viii. Installed Env Display board near plant gate at approx Rs. 3.5 lakhs
- ix. Provide Plastic dust bins for segregate and collect house hold wastes from colony housing of Rs. 2.62 lakhs
- x. Solar heater installed at guest house at approx Rs. 3.00 lakhs.
- xi. Light fitting changed from CFL to LED (Club) at approx Rs. 0.50 lakhs
- xii. Installation of STP for colony housing of Rs.182 lakhs

So the total annual expenditure incurred towards environmental protection
= 1.1 crore + 50 lakh + 7.65 lakhs + 4.1 lakhs + 14.54 lakhs + 18.26 lakhs + 10.5 lakhs + 3.5
lakhs + 2.62 lakhs + 3.5 lakhs + 182 lakhs = 4.07 Crore (Appx)

Annual production of the plant during the year = 25105 MT

So the impact of the pollution abatement measures on the cost of production shall be = Rs
4.07 Crores/25105 MT = Rs 1620 / MT

Thus the plant is incurring an additional expenditure of Rs 1620 / MT of finished product
towards pollution control measures.

PART – H

Environmental Management System in concurrence with the requirements of ISO-14001
standards has been implemented very effectively thro' the following efforts :-

- a. Effective solid wastes management
- b. 100% recycling of waste water
- c. Scheduled water sprinkling of haul roads
- d. Waste dump plantation
- e. Discharging the canteen waste water to Soak Pits thro' settling tank
- f. Imparting EMS training to all the employees.
- g. Proper handling and management of Hazardous Wastes
- h. Optimisation of consumption of natural resources like water & minerals

PART – I

1. Community awareness development programmes on environmental protection are also undertaken through celebration of World Environment Day and showing films on Environmental Protections in captive channel. Involvement of school children, spouse, family members and Road show (Drama) to develop awareness on world Environment day.
2. Also took integrated mosquito control programme to eradicate malaria cases in the colony.
3. TSRDS has done several mobile treatment programs in different villages regarding diseases and their remedial measures with full checkup.
4. The Plant has been certified to the coveted ISO-14001:2004 (EMS) Certification by IRQS, Kolkata.