



By E-Mail

Ref.No.: MGM/P&E/16/23

Date: 27/09/2023

To  
The Member Secretary,  
Odisha State Pollution Control Board,  
Paribesh Bhawan,  
A/118, Nilakantha Nagar,  
Bhubaneswar, 751012

**Subject:** Submission of Annual Environmental Statement in FORM-V for the year ending 31<sup>st</sup> March 2023 in respect of Joda West Iron and Manganese Mine of M/s Tata Steel Ltd.

**Reference:** Rule-14 under Environmental (Protection) Amendment Rule, 1993 (G.S.R.386,22.04.1993)

Dear Sir,


We are hereby submitting the Annual Environmental Statement in "FORM-V" prescribed under the above referenced statute, for the year ending 31<sup>st</sup> March 2023 in respect of Joda West Iron and Manganese Mine of M/s Tata Steel Ltd., At/Po-Bichhakundi, Dist-Keonjhar, Odisha.

This is for your kind information and perusal please. Receipt of the same may please be acknowledged.

Thanking You

Yours faithfully,

F: TATA STEEL LTD.

  
Head, Mine & Production Planning

Joda West Iron & Mn Mine

Ferro Alloys Mineral Division

**Enclosure:** Annual Environmental Statement (FORM-V) for the Financial Year ending 31<sup>st</sup> March 2023

**Copy To:**

- 1) Zonal Office Kolkata, Central Pollution Control Board, South end Conclave, Block 502, 5th and 6th Floors, 1582 Rajdanga Main Road, Kolkata, West Bengal 700107.
- 2) The Regional Officer, State Pollution Control Board, Baniapat, DD College Road, Keonjhar, Odisha-758001.
- 3) MoEF&CC Eastern Regional Office, A/3, Chandrasekharapur, Bhubaneswar-751023

**TATA STEEL LTD.**

Ferro Alloys & Minerals Division, Manganese Group of Mines, At/P.O.: Bichhakundi, Via: Joda,  
Dist: Keonjhar Odisha – 758 034 Tel.: 9238101370, e-mail : mnminesadmin@tatasteel.com  
Regd.Office : Bombay House, 24 Homi Modi Street, Mumbai – 400 001 Tel 912266658282, Fax 912266657724  
Corporate Identity Number L27100MH1907PLC000260 website : www.tatasteel.com



**TATA STEEL**

**ANNUAL ENVIRONMENTAL STATEMENT  
for FY 2022-23**

**[FORM - V]**

*For the year ending 31<sup>st</sup> MARCH 2023*

**[Rule-14 under Environmental (Protection) Amendment Rule, 1993]  
(G.S.R.386,22.04.1993)**

**Submitted By:**

**Joda West Iron & Manganese Mine**

**M/s. Tata Steel Limited**

**At/Po: Bichhakundi, Via-Joda**

**District- Keonjhar, Odisha -758 034**

**FORM V**

[See Rule 14 of Environment (Protection) Amendment Rules, 1993]

**ENVIRONMENTAL STATEMENT**

**for the financial year ending the 31<sup>st</sup> March 2022**

**PART - A**

- (i) Name and Address of the Owner / occupier of the industry operation or process. : **JODA WEST IRON & MANGANESE MINE**

**Nominated Owner:**

Mr. T.V. Narendran  
Managing Director, M/s TATA Steel Ltd.  
Jamshedpur, Dist- East Singhbhum  
Jharkhand - 831 001

**Agent:**

Mr. Awnish Kumar,  
Chief (Manganese Group of Mines), Joda,  
FA & MD, TATA Steel  
P.O.: Bichhakundi, Via : Joda  
Dist : Keonjhar, Orissa - 758 034

- (ii) Industry Category : Opencast Mining
- (iii) Production Capacity - Units : **180,000 Tonnes per annum** (Manganese Ore or 1.80 LTPA (as per Environmental Clearance))
- (iv) Year of Establishment : 1933
- (v) Date of the last environmental statement submitted : 28/09/2021

**PART - B**

**Water and Raw Material Consumption:** Mining is not a manufacturing process thus water is not a raw material essential for production; however, water is used for haul road dust suppression and other support services which are not directly linked with the quantum of production.

- (1) Water Consumption m<sup>3</sup>/day (Av. figures for 2020-21)
- Process : 78.54 m<sup>3</sup>/day (Water sprinkling) (**Total-28667.1m<sup>3</sup>**)
- Cooling : Nil
- Domestic : 54.82 m<sup>3</sup>/day (**Total-20009.3m<sup>3</sup>**)

Name of the Products	Process water consumption per unit of product output	
	During the previous Financial year	During the current Financial year
	(1)	(2)
(1) Manganese Ore	Nil	Nil

**Remarks:** Manganese Ore is produced by mechanized mining method, which does not involve beneficiation and thus precludes the consumption of water. Unlike manufacturing processes, production from mining doesn't involve water as raw material for any of the operational activities.

**(2) Raw material consumption:** Unlike manufacturing processes, mining doesn't involve any such raw materials; However, uses various other resources for ancillary services essential to ensure mining such as Diesel, Electricity and Explosives, etc.

The table below reflects the production and dispatch figures for the last two financial year

Name of the raw materials	Name of the product	Consumption of raw materials per unit	
		During the current Financial year (Year 2021-22)	During the current Financial year (Year 2022-23)
-Nil-	Manganese Ore	<b>Production</b> 115632.000 <b>Despatch</b> 80139.14 MT	<b>Production</b> 164046 MT <b>Despatch</b> 146206 MT

**Remarks:** Mining is not a manufacturing process. The ore produced from Mine head is used as raw material to produce ferro manganese. Other essential resources used during the reporting period (2022-23) is as follows: **Diesel (2337.951KL), Explosive (282700Kg), Electricity (2375253 Kw-h).**

**PART - C**

Pollution discharged to environment / unit of output (Parameter as specified in the Consents issued)

Pollution	Quantity of pollutants discharged (mass/day)	Concentrations of Pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards with reasons
(a) Water	-Nil-	-Nil-	Not Applicable

- There are no direct/indirect source for discharge of effluents/pollutants to the environment. Environmental quality parameters are monitored from time to time to assess the water quality of the nearby streams/nallahs and monsoon runoff from the mining areas. The environmental quality parameters are monitored, and reports are submitted to SPCB as well as MoEF&CC along with six monthly compliances.

(b) Air	-Nil-	-Nil-	Not Applicable
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- There is no such point source of emission from the mine. Major source of air pollutants is fugitive dust generated mainly due to the movement of vehicles/HEMMs in the haul roads, drilling/blasting activities etc, which is fugitive in nature and thus has not been quantified (mass/day).

- The environmental quality parameters are monitored, and reports are submitted to SPCB as well as MoEF&CC along with six monthly compliance reports.

**PART - D**  
**(Hazardous Wastes)**

[As specified under the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016]

Hazardous Wastes	Total Quantity	
	During the previous Financial year	During the current Financial year
	<u>Year (2021-22)</u>	<u>Year (2022-23)</u>
<b>(i) From Process Waste containing Oil</b>	Nil	Nil
Used Oil- HW-5.1 (in Ltrs.)	1900.0	2900.0
Residual waste containing oil- HW-5.2 (Kgs)	6.0	2.5
Empty Barrells – HW 33.1 (in Kgs)	06 Nos (120)	10 Nos (300)
Contaminated cotton rags – HW 33.2 (in Kgs)	0.5	0.8
<b>(ii) From pollution control facilities</b>	Not Applicable Since no point source thus no ESP nor any Bag filters installed.	Not Applicable Since no point source thus no ESP nor any Bag filters installed.

**Remark:** As per the Annual Return (Form-04).

**PART - E**  
**(Solid Wastes)**

	Total Quantity	
	During the previous Financial year	During the current Financial year
	<u>Year (2021-22)</u>	<u>Year (2022-23)</u>
(a) From Process (Overburden material)	2471484 MT	2122890 M <sup>3</sup> (5307225MT)
(b) From pollution control facilities	Nil	Nil
(c)		
(1) Quantity recycled or re-utilized within the unit	Nil	Nil
(2) Sold	Nil	Nil
(3) Disposal	2471484 MT	2122890 M <sup>3</sup> (5307225MT)

**PART - F**

(Please specify the characterization (in terms of composition and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes)

- **Characterization of Hazardous Waste:** - The significant source of hazardous waste is Used oil (HW-5.1) is mainly Hydrocarbons and consist of lubricants, coolants, transformer

oil and hydraulic oil. Lead Acetate batteries are also used in HEMM fleet which are mainly of automotive fuel cells.

- Overburden being the only form of significant solid **waste** contains lateritic morrum, shale and quartzite, etc.
- Horticultural Waste: All the horticultural waste, food waste and biodegradable waste is getting composted at our facilities.
- **Disposal Practice:**
  - **SOLID WASTES** -OB dumps are maintained as per the approved scheme of mine plan where proper terraces and peripheral drains are constructed supported with gabion wall/retention wall to arrest the silt/sediments during monsoon season. Once the slope of the dumps is stabilised then the dumps are reclaimed by plantation of native varieties of forestry saplings.
  - **USED OIL** -The used oil generated at various sources is collected in leak proof barrels and then is 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. The used oil collected from sites are centrally auctioned to an SPCB authorised/registered recycler for recycling. At present, used oil generated from the departmental HEMM fleet (TSL's fleet of HEMM) are managed by the company through auctioning; however major chunk of generation is due to the contractual operations, managed by outsourced agencies as per applicable norms.
  - Provision of impervious pit for collection of oily waste in the workshop premises in addition to the existing practice of collection at specified barrels.

#### **PART - G**

(Impact of pollution abatement measures taken on conservation of natural resources and on the cost of production)

1. Water spraying on haul Roads and Mine Pits is done regularly to suppress the dust.
2. All the haul roads in the mining area are made up of morrum & compacted. Regular repair is being done by dozer & grader after spreading the layer of sweet morrum over it.
3. Wet drilling is practices along with controlled blasting followed for minimal dust generation and prevent fly rocks.
4. We have planted around 11.54 lakh nos. of trees over an area around 225.9 ha till 2019-20. Including areas over safety zone, OB dump and as avenue plantation. As per the recent survey findings, plantation attaining self-sustaining stage at the end of FY23, is around 505712 Nos. During FY 2022-23, around 8624 nos of saplings have been planted.
5. Safety Zone Strengthening work over five discrete patches along the mine lease boundary have been done with the theme of Bamboo Forestry over 3.46 ha with around 5342 nos of saplings.
6. The mine management proactively undertakes various environmental activities for the conservation/protection of environment. The cost incurred towards environmental measures are earmarked in a separate fund center. An abstract environmental expenditure during FY 22-23 is summarised in the table as follows:

Table. Environmental Expenditure for 2022-23

S.No.	Environmental Conservation/ Protection Measures	Expenditure (Lacs-INR)	
		Proposed	Actual
1	Afforestation on Dump slopes as per PMCP	5.5	7.2
2	Construction/Maintenance of retaining wall	4	5.5
3	Construction/Maintenance of Garland drain, settling pits with check dam	1.85	2.15
4	Env. Awareness/Mines Environment & Mineral Conservation Week Celebration	5	6.5
5	Annual Environmental Monitoring	5.4	5.2
6	Operation & Maintenance of Automatic Wheel Wash System	2.5	3.15
7	Development & Maintenance of Mango Orchard (1Acrea 700 saplings)	3	4.5
9	Dust Suppression-Mobile Water Tanker & Fixed Sprinkling System	15.5	14.6
11	Operation & Maintenance of New WTP (400KLD)	6.45	7.65
12	Surveillance Water Audit by FICCI	3.5	3.65
14	Sapling Propagation at Inhouse Nursery-50000	10.5	9.4
15	Occupational Health Surveillance Programme	14.5	16.8
<b>Total</b>		<b>77.7</b>	<b>86.3</b>

7. In addition, Tata Steel Rural Development Society also undertakes the peripheral development activities with a large magnitude.

#### PART - H

(Additional measures / investment proposal for environmental protection, abatement of pollution, prevention of pollution)

- Garland drains and toe wall around the OB dumping shall be provided to check and channelize surface run-off.
- Plantation of forestry species shall be planted over the inactive waste dump slopes to arrest the airborne dust.
- Vetiver Plantation has been done in inactive dump slope.
- Green belt has been developed along colony and mining.
- Soil Conditioning and treatment practices followed for land reclamation
- In-House nursery for development of native varieties of forestry saplings.

#### PART - I

(Any other for improving the quality of environment)

- With compliance to conditions of Environment Clearance obtained from MoEF&CC, the following monitoring is being done at regular interval.

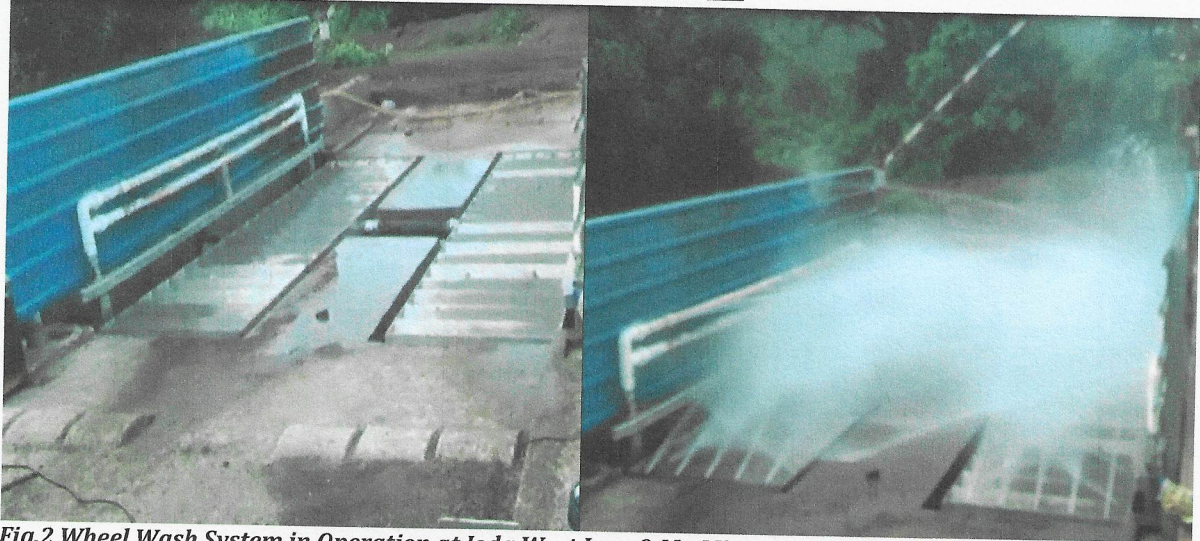
- Ground Water Level at nearby bore wells
  - Trace metal in dust fall
  - Ground water quality at lower level
  - Meteorological monitoring
  - Trace metals such as Fe, Cr+6, Cu, Se, As, Cd, Hg, Pb, Zn and Mn at specific locations for both surface water (downstream & upstream) and ground water at lower elevation is being periodically monitored by referring to the standards as per BIS : 10500.
2. Topsoil generated during excavation are utilized immediately for nursery development and dump slope plantation.
3. Measures taken to control Air Pollution: -
- Water sprinkling on the haul road,
  - Provision of dust masks to the workmen,
  - Adoption of wet drilling arrangement in the drill machines and
  - Black topped road in the residential colony.
  - Green belt along mining and colony
  - Native sapling and vetiver plantation in inactive dumps.
4. Measures taken to control Water Pollution: -
- Construction of toe wall and garland drain along the dump slope to prevent surface run-off during monsoon.
  - Construction of soak pits for discharge of sanitary sewage.
  - Provision of oil separation pit for effluents coming out of workshop.
  - Native sapling and vetiver plantation in inactive dumps.
  - STP for domestic effluent in Joda West colony.
5. Measures taken to control Noise & Ground Vibration: -
- Thick plantation has been developed around the mines and office building to provide a canopy cover
  - Implementation of advance blasting technique (NONEL) to reduce the blast induced ground vibration and
  - Workmen are provided with earmuff while working near heavy earth moving machineries.
6. Measures taken to control Land Degradation: -
- Afforestation around the non-active dump for stabilization and
  - Reclamation and rehabilitation of mined out area as per approved Scheme of Mining.



7. Surveillance of Occupational Health: - Periodical Medical Examination of employees (departmental & contractual) are conducted as per prescribed norms of Mines Rule, 1955. The initial and periodical examination includes blood haematology, blood pressure, detailed cardiovascular assessment, neurological examination etc.
8. The mine is certified with ISO-14001:2015 (Environment Management System).

### **PHOTOGRAPHS OF WHEEL WASH FACILITY**

***Fig.1 Automatic Wheel Wash Facility @ Joda West Iron & Mn Mine***



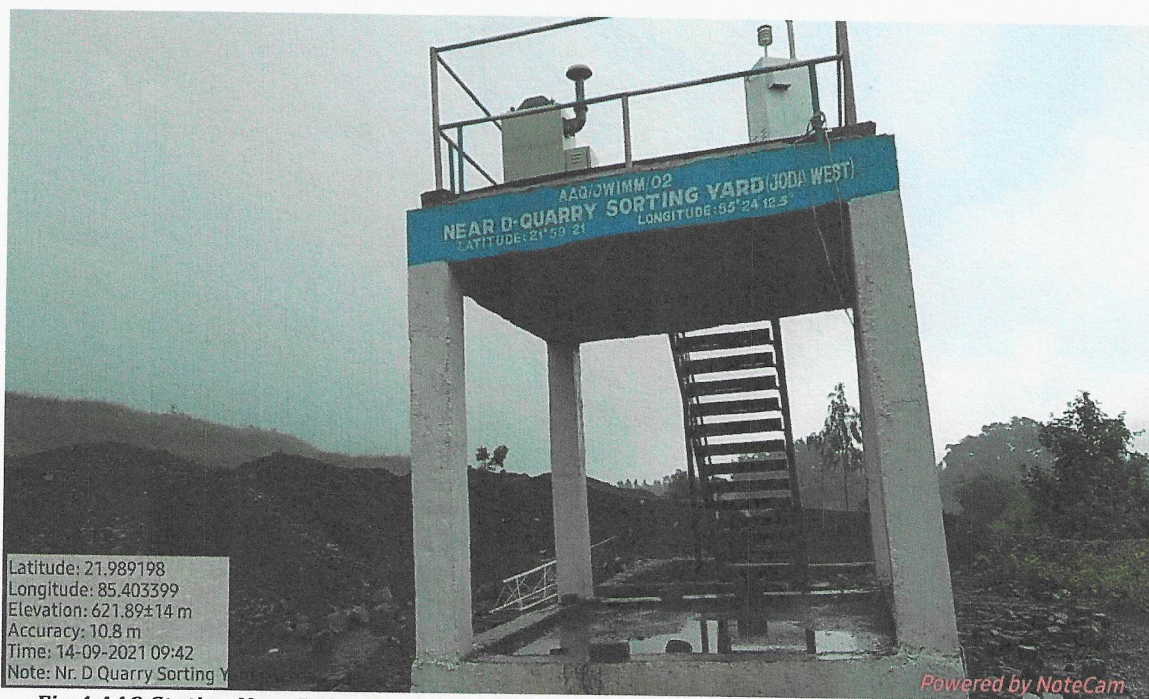
***Fig.2 Wheel Wash System in Operation at Joda West Iron & Mn Mine***



### PHOTOGRAPHS OF AAQ STATIONS (CORE ZONE)



***Fig.3 AAQ Station Near Time Office (Joda West Iron & Mn Mine)***



***Fig.4 AAQ Station Near D-Quarry Sorting Yard (Joda West Iron & Mn Mine)***



Latitude: 21.997656  
Longitude: 85.408191  
Elevation: 618.38±20 m  
Accuracy: 11.1 m  
Time: 14-09-2021 09:49  
Note: Nr. D Quarry Screen p

Powered by NoteCam

***Fig.5 AAQ Station Near Screen Plant (Joda West Iron & Mn Mine)***



Latitude: 21.997353  
Longitude: 85.413158  
Elevation: 550.72±14 m  
Accuracy: 16.4 m  
Time: 14-09-2021 10:11  
Note: Nr. Gangeiguda pit J.

Powered by NoteCam

***Fig.6 AAQ Station Near Gangeiguda Pit Shelter (Joda West Iron & Mn Mine)***



Latitude: 21.997656  
Longitude: 85.408191  
Elevation: 618.38+20 m  
Accuracy: 11.1 m  
Time: 14-09-2021 09:49  
Note: Nr. D Quarry Screen p

*Fig.7 AAQ Station Near Screen Plant (Joda West Iron & Mn Mine)*

## **BEST ENVIRONMENTAL PRACTICES**

### **Haul Road Dust Suppression Measures:**



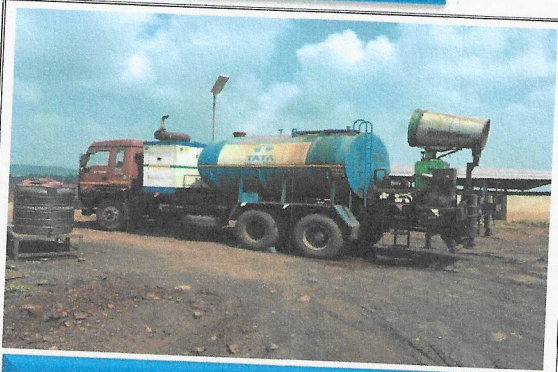
*Grader for Haul Road*



*Grader for Haul Road*



*Fixed Sprinkling System*



*Mobile Mist Canon*

**Special Sustainable Projects (Central Facilities for Mn Group of Mines)**

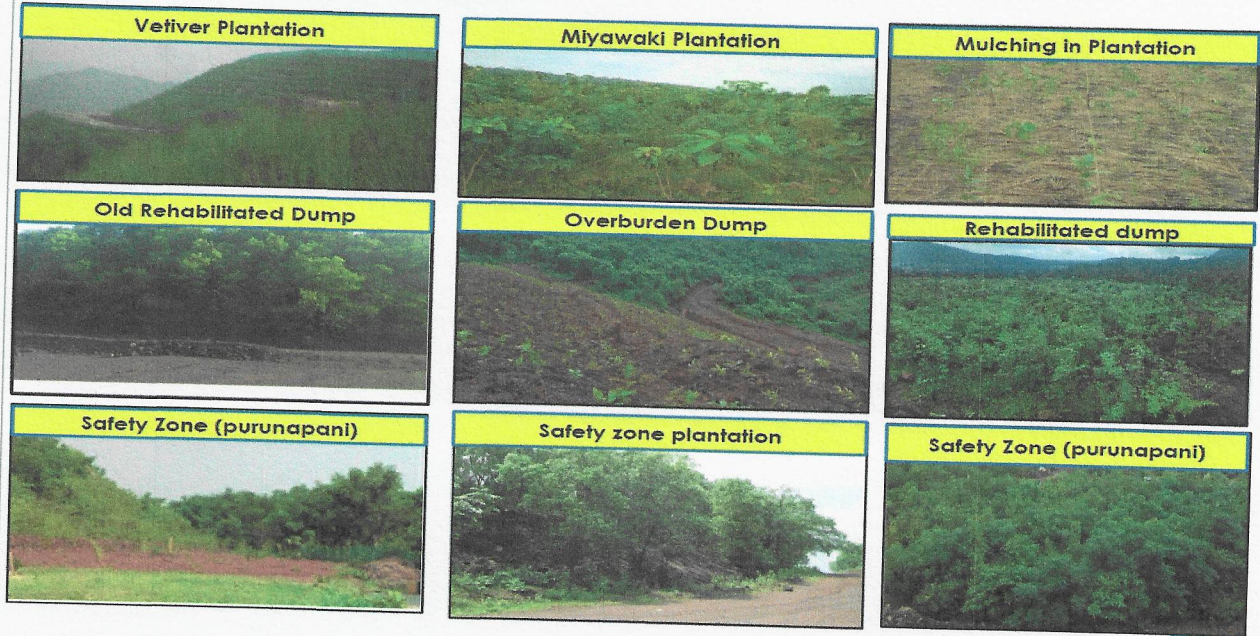
 <p>Environment Management</p> <p><i>Vertiber Plantation-Slope</i></p>	 <p>Environment Management</p> <p><i>RWH-Pisciculture by SHG</i></p>
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**Surface Runoff Management: Network of Garland Drains, Toe Wall & Rain Pass**

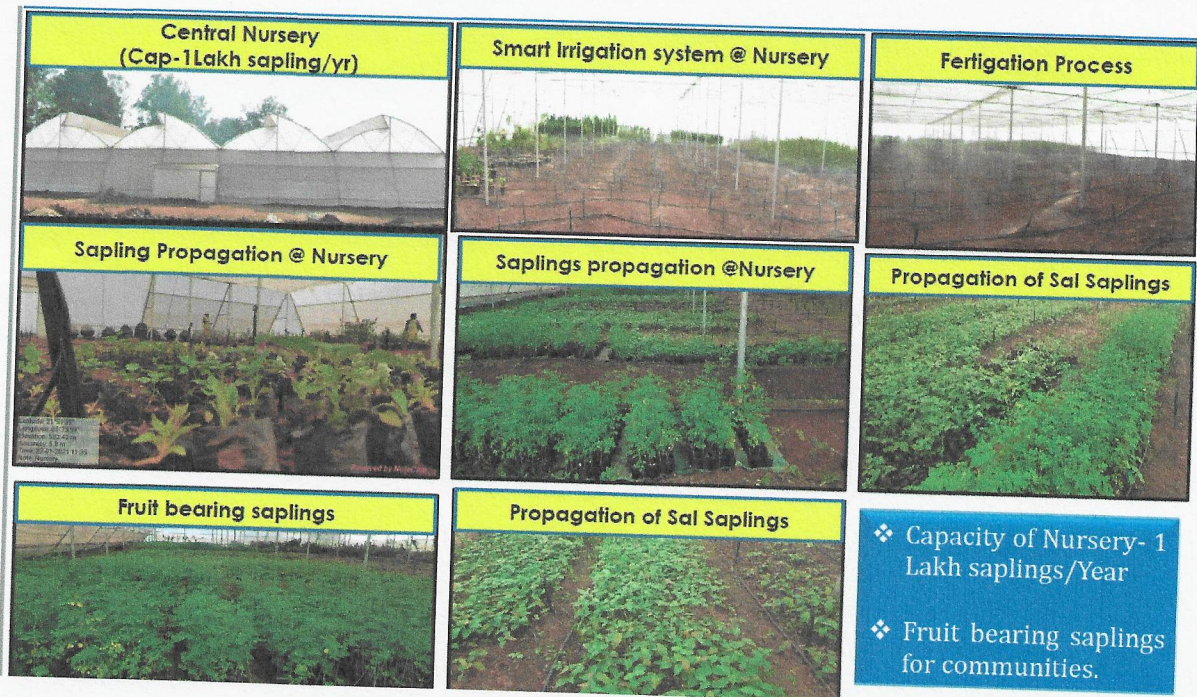


*Toe Wall & Garland Drains for Runoff Management*

**Greenbelt & Afforestation Measures:**



**Central Nursery at Mn Group of Mines**



Scientific Processes Adopted for Land Rehabilitation-Soil Condition

**Lock-Key Arrangements**



**Lock-Key Arrangements**



**Submitted By:**

Joda West Iron & Manganese Mine  
Tata Steel Limited  
Date: 27-Sep-2023

  
Head (MPP)  
& M, JODA  
Steel Ltd.