VERIFICATION REPORT OF THE GREEN BELT / PLANTATION

Developed By: M/s Jindal Steel & Power Limited
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Chhatauna, Mandir Hasaud, Raipur, Chhattisgarh

SINCE 1995
RITEE

In Association With

Aaditya Environet LLP

(ISO / IEC 17025, 2017 (NABL Certified Laboratory), ISO 9001:2015, 14001:2015, 45001:2018 Certified Laboratory)
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Report on

Verification of Green belt / Plantation

M/s Jindal Steel & Power Limited,

Post Box # 16, Kharsia Road
Raigarh – 496001, Chhattisgarh
Date of Site visit: 2 to 7 February 2025

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INTRODUCTION

Green vegetation cover is beneficial in many ways leading to conservation of biodiversity, retention of soil moisture, recharge of ground water and maintaining pleasant micro climate of the region. In addition, vegetation cover can also absorb pollutants from the environment and helps in effective pollution control.

Green belts are planned open spaces safeguarded from developmental activities such as construction of buildings, factories, dams, etc. Safeguarded in the sense that no infrastructural development will be allowed on such designated areas and these areas will only be used for growing vegetation cover on it. Green belts in and around urban and industrial areas are important to the ecological health of any given region.

In history, there are very few records of green belts. One of the important examples is of Queen Elizabeth I of England. She had banned new buildings in a three mile wide belt around the City of London in 1580.In very recent time, the green belt policy was pioneered in the United Kingdom in the 1930s. Campaign to Protect Rural England (CPRE) and various other organizations have helped to spread awareness about Green belts in United Kingdom.

The objective of Green belt varies from country to country and region to region. The common objectives are to protect natural environments such as biodiversity etc, to improve air quality of the region, pollution control, to maintain micro climate of the region, etc. Green Belt Development is an important tool that aims at overall improvement in the environmental conditions of the region.

Regulations / environmental law for Green Belts Development in India

Environmental protection has been considered as an important domain for industrial and other developmental activities in India. Ministry of Environment & Forests (MoEF) has taken several policy initiatives and promoted integration of environmental concerns in developmental projects. One such initiative is the notification on Environmental Impact Assessment (EIA) of developmental projects issued in 1994 and further revised notification in year 2006 under the provisions of Environment (Protection) Act, 1986. EIA is now mandatory for 40 categories for developmental projects. EIA Guidance Manual for building, construction, townships and area development projects proactively talks about the importance of green belts in such projects.

Environmental Guidelines for Industries developed by MoEF, suggest that the industries must care about the surrounding environment and minimize the adverse impacts of industrial operations in the immediate neighborhood as well as distant places. Therefore, these guidelines mandate project owners to maintain the certain distances by the industries from the areas like ecologically sensitive areas, Coastal areas, Flood Plain of the Riverine Systems, Transport/Communication System and Major settlements.

In addition, these guidelines also mandate that economic and social factors have to be recognized and assessed while citing industry. Following are the key points that all industries need to follow while moving ahead with the establishment of manufacturing/processing unit in certain areas. These are;

1. No forest land shall be converted into non-forest activity for the sustenance of the industry.
2. No prime agricultural land shall be converted into industrial site.
3. Within the acquired site the industry must locate itself at the lowest location to remain obscured from general sight.
4. Land acquired shall be sufficiently large to provide space for appropriate treatment of waste water still left for treatment after maximum possible reuse and recycle. Reclaimed (treated) wastewater shall be used to raise green belt and to create water body for aesthetics, recreation and if possible for aquaculture. The green belt shall be 1/2 km wide around the battery limit of the industry. For industry having odour problem it shall be a kilometer wide**.**
5. The green belt between two adjoining large scale industries shall be one kilometer.
6. Enough space should be provided for storage of solid wastes so that these could be available for possible reuse.
7. Lay out and form of the industry that may come up in the area must conform to the landscape of the area without affecting the scenic features of that place.
8. Associated township of the industry must be created at a space having physiographic barrier between the industry and the township.
9. Each industry is required to maintain three ambient air quality measuring stations within 120 degree angle between stations.

As per the National Forest Policy, 1988 (NFP), It is necessary to encourage the planting of trees alongside of roads, railway lines, rivers and streams and canals, and on other unutilized lands under State/corporate, institutional or private ownership. NFPgive emphasis on the green belt development.It says – Green belts should be raised in urban/industrial areas as well as in arid tracts. Such a programme will help to check erosion and desertification as well as improve the microclimate.

As per the stipulations of MoEF, green belt is to be provided all around the power station boundary by planting trees and the total green area including landscaping area will be 1/3rd (About 33%) of the plant area. This will include Lay down area which will be later on converted into Green area.

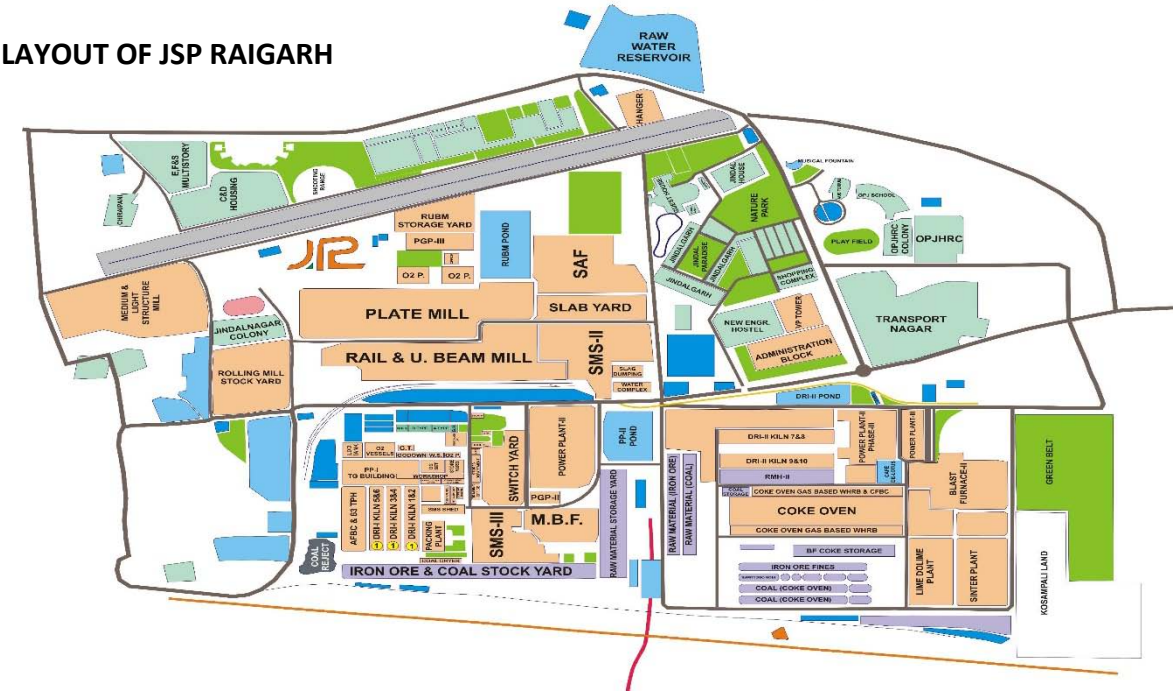
In India, there is no exclusive green belt regulation/policy. However, under the purview of other regulations such as Environmental Guidelines for Industries, Environment Management Plan, National Forest Policy, Forest Conservation Act, etc; certain percentage of land designated for green belts is recommended for different categories of industrial projects. Expansion of agricultural, urban and industrial activities are causing additional burden on natural resources. Industrial development is causing severe health hazards due the exceeded level of pollution. Green belt not only restrict environmental pollution but it helps to maintain the ecological balance of the region.

The **Aaditya Environet LLP and Raipur Institute of Technology (RITEE), Raipur Chhattisgarh** has been taken the responsibility of verification of the green belt developed in the Jindal Steel & Power Lmited, Post Box # 16, Kharsia Road, Raigarh, Chhattisgarh.

ABOUT THE COMPANY

Brief History: JSPL Raigarh is presently a 3.60 Million Ton Integrated Steel Plant located in Chhattisgarh State with various product mix like Plates, Coils including 121 M long rail & structural (heavy structural's), angle, channel, beams etc.

LAYOUT OF JSP RAIGARH



The present production capacity of JSPL including its own captive power and various units is as mentioned below:

PRODUCTION UNIT	UNIT	CAPACITY
DRI	MTPA	1.32
SMS	MTPA	3.60
Oxygen plant	TPD	2050
Blast Furnace	MTPA	3.05
Producer Gas Plant	Nm3/hr	75,000
Limekiln Dolime plant	MTPA	0.40
Power plant	MW	299
SAF	MTPA	0.06
Rolling mill	MTPA	0.75
Coke oven	MTPA	0.80
Sinter plant	MTPA	2.85
Plate mill	MTPA	1.00
MLSM	MTPA	0.70

Technology:

In JSPL innovation is intrinsically and deeply embedded and therefore the use of innovative methods and technology has always been encouraged. The business model for steel making, DRI-BF-EAF being practiced is unique amongst the primary steel makers. Considering the quality of raw materials, essentially, iron ore & coal along with power availability, will prove to be the most effective and competitive process route for our nation.The Plant is having two Blast Furnaces of 0.80 MTPA & 2.25 MTPA respectively with facilities like bell-less top, height-top-pressure, high hot blast temperature, coal dust injection & slag granulation.

The Steel Melting Shop-II is equipped with single strand slab caster, 4 strand combi caster, unique in India, for producing near net shape beam blanks, rail blooms and rounds, in addition to state of the art 6 strand billet caster. The Steel Melting Shop-III is equipped with 4 strand combi caster & 6 strand billet caster for producing different grade/sizes to meet the customer demand.

The Rail & Universal Beam Mill has state-of-the-art Tandem Mill with universal rolling X-H technology for producing medium and heavy parallel flange beams and columns along with rails for the first time in the country. It also has the capability of producing the world's longest rails of 121 meter single length which can

be further flash butt welded to 480 meters. The Plate Mill is capable of producing the 3.5 meter width wider section plates. This is a reversible mill with Steckle furnaces on both side of finishing mill with up coiler. The finishing facilities include three units of Cut-To-Length line. Provision exists for off-line normalizing for heat treatment of Boiler Quality Steel and other grades. The Mill is capable to produce both coils and discrete plates.The Medium & Light Structural Mill (MLSM) equipments and technology of rolling structural in continuous mill was supplied by M/s Danieli Italy. 17 numbers of sections were developed so far in Angles, Beams and Channels till date. Future plan is to develop 4 new sections in coming six months.

Keeping in view the long term cost competitiveness in steel production, the capacity of Sinter plant was enhanced from 2.3 MTPA to 2.5 MTPA. Capacity enhancement was done by increasing the sinter bed width from 3 meter to 3.3 meter along with installation of new ignition furnace, feed drum, crush deck and modification in surge bin and hearth layer.

SALIENT FEATURES OF JSPL RAIGARH

Name of organization	**Jindal Steel & Power Limited**
Plant Capacity	3.60 Million T per annum crude steel
Year of Establishment	1989
Total Land Area	Approx. 1913 Acres (including ash pond and its return water reservoir, Parsada slag storage facility, Dairy etc.)
Location	The plant is situated in the state of Chhattisgarh. It is about 7.5 km from Raigarh town (which is district headquarters) on the state highway linking Raigarh with Kharsia and Bilaspur .
Longitude	83°20'6.43"E to 83°20'4.01"E 83°21'11.31"E. to 83°21'21.60"E

Latitude	21°56'20.47"N to 21°55'33.88"N 21°54'50.91"N to 21°56'6.31"N
Altitude	244 above MSL
Seismic Zone	Zone – III
Nearest river	The nearest river is Kelo, a tributary of Mahanadi river, flows at a distance of about 10 km away from the plant (on the east side). Another perennial river, Mand, which also is a tributary of Mahanadi river flows at a distance of about 12 km from the plant on the SW direction. Mahanadi, one of the major river of India flows at a distance of nearly 50 km on the SW direction.
Certifications	Certified with ISO 9001 in 1996 Certified with ISO 14001 in 2000 Certified with OHSAS 18001 in 2009

ENVIRONMENT MANAGEMENT PRACTICES

A. ABOUT THE TEAM - JSPL at Raigarh has built up a strong Environment Management Department (EMD) having multi-disciplinary team of professional and technical staff with vast experience - fully abreast of state-of-the-art technologies and having an intimate understanding of the latest environmental scenario. Responsibilities of this department are to carry out impact assessment of new projects, obtain environmental clearances from Government bodies, ensuring compliance to statutory obligations, environmental monitoring to check efficacy of environment management practices, developing greenery in and around JSPL Complex and creating environmentally aware workforce.

There are sophisticated monitoring equipment available in Environmental laboratory like Combustion Online Ambient Air Quality Monitoring Stations and CEMS with Centralized data acquisition system, Atomic Absorption Spectrophotometer, GCMS, Flue Gas Analyzer, Stack Monitoring Kits, High Volume Sampler & Respirable Dust Samplers, pH meter, Spectrophotometer, Turbidity meter, Autoclave, Laminar Flow, Mercury Analyzer, Flame

Photometer, CO Monitor etc. We have established a very sophisticated Microbiological Laboratory for testing water quality.

B. ISO CERTIFICATION -JSPL, Raigarh is an ISO 9001:2015, ISO 14001:2015 and OHSAS 45001:2015 Certified Company by BSI, having integrated documentation system for QMS, EMS and OH&S Management system. At JSPL, more than 50 departments/sections are covered under ISO Systems which is being audited two times in a year through trained ISO Internal Auditors and two External Audits by Certification Body to check fulfilment of requirement as per ISO standards.

KML File where Green color shows Green belt / Plantation area

C. AIR POLLUTION CONTROL –JSPL is deeply passionate about maintaining a clean and green environment in & around its area of operation. Air pollution is one of the major challenges that any company has to overcome in order to adhere to environmental norms. Keeping this in mind, JSPL follows a procedure of Total Productive Maintenance (TPM) for prevention of Air Pollution. Every aspect of pollution generated due to plant activities is monitored in detail and adequate steps are taken to minimize it. The company has installed state-of-art pollution control devices suitable for the purpose of reducing atmospheric pollution. Real time check on performance of these devices is done through automated online analyzers such as Opacity Meters, gaseous analyzers and Ambient Air Quality Monitoring Stations (AAQMS). Results are directly linked to website and CPCB server (http://www.envirotechlive.com).






D. WATER MANAGEMENT -Water pollution is a major environmental concern today that adversely effects the surroundings causing serious injury to environment as well as human health. At JSPL, water pollution is controlled by adopting a range of monitoring processes and treatment measures. Resource conservation through optimization of water use and their reuse after required treatment is an integral aspect of the company's environment management plan. Various conservation, treatment and reuse measures are implemented which includes adoption of close circuit system, neutralization pit, effluent recycling system, effluent treatment plants, oil-water separators, sewage treatment plants etc.


E. SOLID WASTE MANAGEMENT -Waste minimization and utilization with proper management is a prime focus of JSPL. Organization has adopted 4 "R"s namely Reuse, Recycle, Reduce & Recover and is making all possible efforts to covert waste into wealth. We have made systematic procedure to identify, segregate of solid waste and store in the specific destination for temporary basis. Later segregated solid waste is sent to Sinter Plant and Extrusion Plant for further use in process.

Char generated from DRI is reused in power plant as fuel.Blast furnace slag is used for making cement.A captive fly ash brick manufacturing plant of 3 lac bricks per day installed. A vermi-composting plant within the premises allows conversion of organic waste to manure by using earthworms. The resultant manure is used for the purpose of gardening.A 3 TPD bio-methanation plant is installed under the supervision of bio technology division of BARC, Mumbai. The degradable wastes generated in the premises are usefully utilized for domestic gas generation.For 100% utilization of SMS slag, Company has entered on a long term agreement with M/s ECOMAISTER, South Korea for preparation of PSB (Precious Slag Balls) through slag atomizing technology. The granules produced by this technology can be used as abrasive blast material, counter weight, bicycle road material, water treatment media, polymer concrete material, road pavement material, hume pipes, tetra-pods, concrete bricks, concrete pipes etc.

F. HOUSEKEEPING - JSPL adopts mechanized housekeeping methods in order to keep the area clean and dust free. The environment management department monitors the housekeeping operations, which are carried out on a regular basis. Training programs are offered to the employees of different departments to increase their awareness in housekeeping. Shop floor employees are also posted in various departments who work under the guidance of the housekeeping coordinators to keep the surroundings clean.

All Roads are cleaned and sanitized.Work areas are regularly maintained and well painted.Drains have been provided along the roads to carry runoff water and water stagnation is not allowed.Scrap yard developed to put all scrap/ wastes at an identified place.Waste bins are provided at required locations for waste collection. Segregated waste is systematically and scientifically disposed.

VARIFICATION OF GREEN BELT:-

In India green belt development is mandatory as per rules and regulation by Ministry of Environment, Forest & Climate Change (MoEFCC), Central Pollution Control Board (CPCB) and State Pollution Control Board. To fulfill this requirement JSPL has established an environment management department (EMD), which is responsible for compliance of all applicable regulatory requirements i.e. pollution control, horticulture activities, housekeeping and greenbelt development in the plant area.

Quantitative analysis

For the verification of the green belt developed by Jindal Steel & Power Limited, Raigarh plant team M/s Aaditya Environet LLP and RITEE, Raipur visited the plant and meet the official of the Environment Management Department, and discussed with them about their environment management practices. After that representative of Aaditya Environet LLP & RITEE, Raipur visited all the plantation sites for the physical verification and remuneration was carried out with the EMD staff of the plant. The detail of plantation activates and horticulture development is given in table below.

MAJOR SPECIES OF PLANTS –

Sl. No.	Common Name	Scientific Name
Forest Species		
1	Neem	Azarichtaindica
2	Bar (Bargad)	Ficusbengalensis
3	Pipal	Ficusreligiosa
4	Siris	Albezzialebbeck
5	Gamhar	Gmeliaarborea
6	Simal	Bombaxceiba
7	Teak	Tectonagrandis
8	Kadam	NeolamarckiaCadamba
9	Bamboo	Bambusastrictus
10	Shisham	Delbergiasissoo
11	Khair	Acacia catechu
12	Mahua	Madhucalatifolia
13	Chakundi	Cassia siamea
14	Karanj	Pongamiapinnata
15	Arjun	Terminalia arjuna
16	Chhatwan	Alstoniascholaris
17	Weeping fig	Ficusbenjamina
18	Bakain	Melia azadirach
19	Babul	Prosopisjuliflora
20	Bakul	Mimusopselengi

Sl.No.	Common Name	Scientific Name
Avenue / Flowering Species		
1	Peltophorum	Peltophorumferriginum
2	Amaltas	Cassia fistula
3	Gulmohur	Delonixregia
4	Asok	Sarracaasoka
5	Ashok	Sarracaindica
6	Lagerstromia	Lagerstromiaspeciosa
7	Kachnar	Bahunia alba
8	Kachnar	Bahuniapurpuria
9	Plumeria	Plumeriaalbe
10	Plumeria	Plumeriarubra
11	Kaner	Thevetia species
12	Oleander	Thevatia species
13	Silver oak	Grevelliarobusta
14	Taubabia	Taubabiaurgentia
15	Caecalpinnia	Caecelpinniapulcharimma
16	Palas	Butea monosperma
17	Cordia	Cordia sebestina
18	Tekoma	Tekomagaurichouri
19	Gliricidia	Gliricidiamaculata

Sl. No.	Common Name	Scientific Name
Fruit Species		
1	Mango	Mangiferaindica
2	Guava	Psidiumguajava
3	Sharifa	Annona reticulate
4	Kathal	Artocarpusheterophyllus
5	Chikoo	Achraszapota
6	Litchi	Litchi chinensis
7	Aonla	Phyllanthusemblica
8	Kaju	Anacardiumoccidentale
9	Coconut	Cocusnucifera
10	Jamun	Syzygiumcumini
11	Pumelo	Citrus maxima
12	Mausambi	Citrus limetta
13	Ber	Ziziphusmauritiana
14	Imli	Tamarindusindica
15	Beal	Aegle marmelos
16	Papaya	Carica papaya
17	Sahjan	Moringaoleifera
18	Orange	Citrus sinensis
19	Lemon	Citrus limon

Sl.No.	Common Name	Scientific Name
Palms & Cycads		
1	Cycus	Cycusrevoluta
2	Cycus	Cycuscerenallis
3	Fish tail Palm	Caryota mitis
4	Fish tail Palm	Caryotaurens
5	Bismarkia Palm	Bismarkianobilis
6	Chamaedorea	Chamaedoreaelegens
7	Betel Nut	Areca catechu
8	Metallica Palm	Chamaedoreametallica
9	Areca Palm	Chrysalidocarpuslutescens
10	Red Areca	Cyrtostachysrenda
11	Licuala	Licualagrandis
12	Chamaedorea	Chamaedoreaadscendeus
13	Phoenix	Phoenix canariensis
14	Phoenix	phoenixroebelenii

SUMMARY		
1	Forest Species	20
2	Ornamental	19
3	Fruit Bearing	19
4	Palms & Cycads	14
TOTAL NO. OF SPECIES		**72**

FACILITIES - To cater the horticultural need of complex, various nurseries have been developed, where saplings of forestry trees, ornamental trees, shrubs and green foliage are prepared and nursed. In forestry nursery, company has capacity of generating about 1 lac saplings, which is used for their own requirements as well as of others as and when demanded. In horticultural nursery company has capacity of generating about 2 lac saplings of various ornamental trees, shrubs and foliages.

PLANTATION DETAIL

SN	LOCATION	TREE PLANTED	SURVIVAL
1	OP Jindal School Premises	19200	84%
2	Teachers' Colony	6110	85%
3	Musical Fountain	2230	85%
4	OP Jindal Auditorium	1040	86%
5	Hospital Colony	2000	85%
6	EMD Office area	1500	85%
7	Blast Furnace-II area	1800	83%
8	PCM, Auction Yard, BF Chowk	2210	85%
9	Simplex Area	12750	85%
10	Around Mansarovar Reservoir	6620	84%
11	Gate # 1 to Gate # 2	5000	85%
12	Median from STP 1 to Babuji Square	4500	85%
13	Central Avenue Left side	4000	87%
14	Central Avenue Right side	4300	87%
15	Gate # 1 Nursery	2330	85%
16	Old Administration Block	1550	85%
17	Old Club House	3000	85%
18	Mandir Premises	1850	85%
19	Near ERS # 2	1200	85%
20	Airstrip Left side	25000	85%
21	Airstrip Right side	17120	85%
22	Plate Mill Dumping area	3500	85%
23	Jindalnagar to MLSM	3000	85%
24	Plate Mill Dump Top	4400	82%
25	PGP-III road	3000	86%
26	PGP-III to Chiraipani	6580	85%
27	PGP-III to Pologround	4500	85%
28	SAF area	2000	85%
29	Canal Road	3300	84%
30	Kothi Road	2720	85%
31	Airstrip blind turn Road	2200	86%
32	Hanger area	3100	85%
33	Water Treatment Plant	2240	82%
34	Air Traffic Control Room area	1400	85%
35	Shooting Range area	2440	86%
36	Opp. New C&D Colony	1250	85%
37	Opp. NF Colony	2200	85%
38	Hill View Colony	3300	85%

SN	LOCATION	TREE PLANTED	SURVIVAL
39	Between Hill view & C&D, Shooting range	29200	87%
40	Transport Nagar to Chiraipani road	55600	85%
41	Around DRI-II Pond	2500	85%
42	Around PP-II Pond	2400	85%
43	Around SAF Pond	4500	84%
44	Around PP-I Pond	3000	85%
45	Around Café-d-Lotus Pond	820	85%
46	Power Plant-II Office area	750	85%
47	Power Plant-II Gate no 2 &3 railway side	850	90%
48	Forgine Plant (Back side of office)	1500	90%
49	DRI-II to Blast Furnace-II Road both Side	2200	85%
50	Opp. DRI-II Pond	850	85%
51	Around JLEC Guest House	2600	86%
52	Around Kothi	3000	85%
53	Around ED Banglow	1650	85%
54	Jindal Paradise	3500	85%
55	Jindalgarh colony	2434	85%
56	Parsada Colony (Model town)	4400	84%
57	Parsada Reclaimed Dump Yard	12000	85%
58	Around Ash Dyke 1 & 2	15000	85%
59	Towards southern boundry	4000	82%
60	Towards northern boundary	15000	85%
61	Blast Furnace to Kalmi Railway crossing	2000	86%
62	Opp. Old clubhouse canteen	1100	85%
63	STP-II & STP-III area	1550	86%
64	Vermi Composting Plant area	1770	85%
65	Pond In front of Scrap Yard	1150	85%
66	Hot metal railtrack from BF-II to SMS	3500	81%
67	Around Pologround	16800	85%
68	Auction Yard area	1480	85%
69	Dairy premises	5440	87%
70	Railtrack from Gate # 4 to Gate # 6	2550	85%
71	Opp. Limedololime Plant	850	85%
72	Fountain chowk to Bhagwanpur	12000	85%
73	Sanjivani Nursery	7780	88%

SN	LOCATION	TREE PLANTED	SURVIVAL
74	Bio-methanation Plant area	790	85%
75	Green-wood Nursery	560	85%
76	Taru-Mitra Nursery	1080	84%
77	Plate Mill Nursery	880	85%
78	Nature Park	22100	85%
79	Green Park	6880	86%
80	Around DRI-I area	1080	85%
81	Around Sinter Plant	1570	85%
82	RMH Area	1160	85%
83	Logistics area (Near DRI-I)	36000	85%
84	RUBM Road	1200	87%
85	Plate Mill road	1330	85%
86	Around Jindal Centre	4420	85%
87	Fruit orchard	9440	86%
88	JindalGargh Shopping Complex	780	95%
89	Grazzing area	280	100%
92	Green Cover (Lawns) m2	48000	95%
93	Kalmi Road side	1200	88%
	JSPL TOTAL	**540914**	
94	Cement Plant premises	30121	84%
95	JSCL (A subsidery unit of JSPL)	2166	86%
	TOTAL JSPL RAIGARH	**5,73,201**	

SUMMARY OF AREA VS TREE PLANTATION

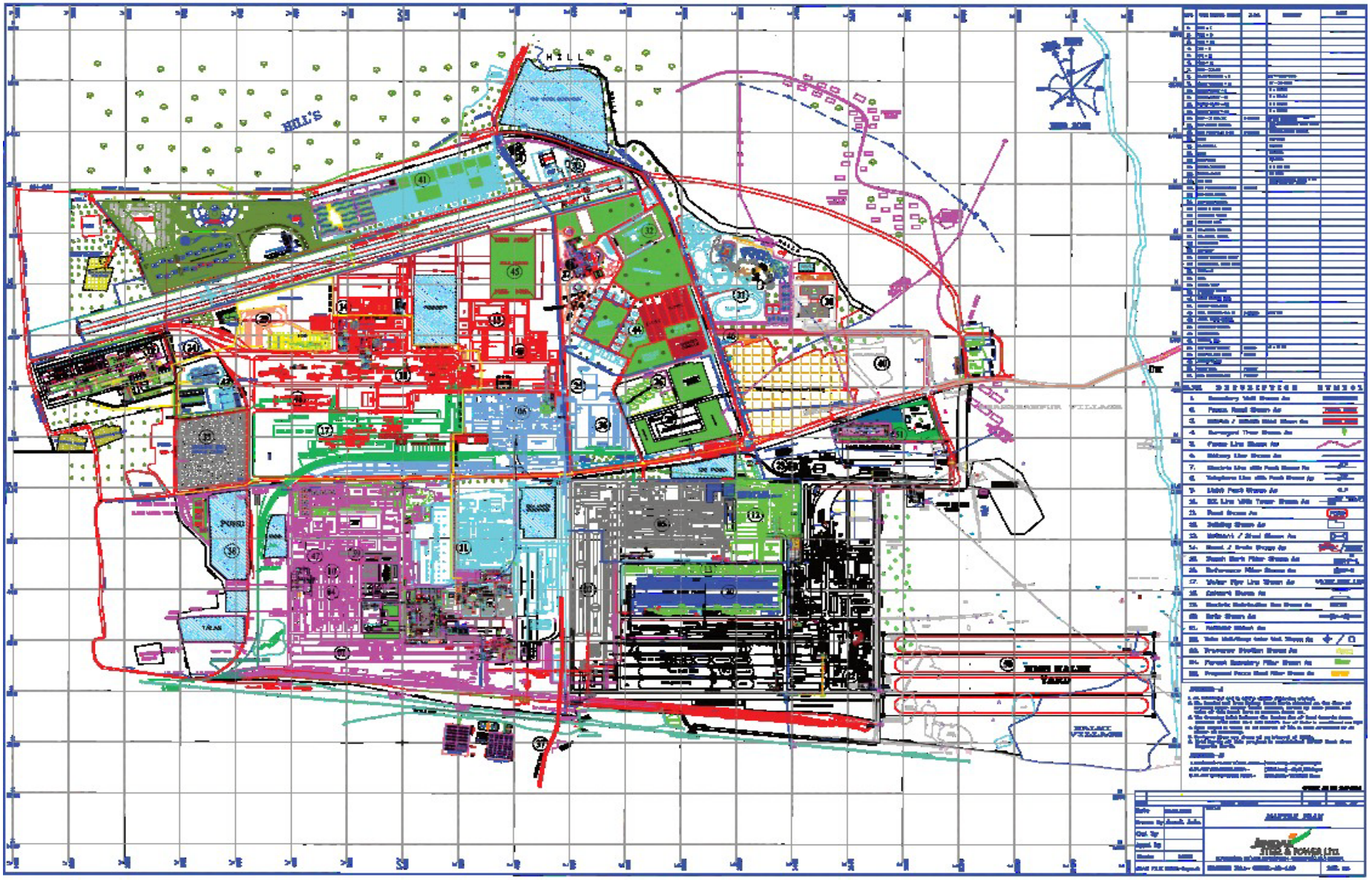
Unit Name	Area in Acre	Area in Ha	Total Trees	Plantation Area	Density/Ha	%	Survival Rate
JSPL Raigarh	1913	774	540914	255.50	2117	> 33%	85%
JSPL Cement Plant, Gejamuda	56.76	23	30121	12.0	2510	> 33%	84%
Rail Forging Plant (JSCL)	6.9	2.8	2166	0.925	2342	> 33%	86%

Note: More than 33% area has been covered under Plantation of the total project area.

Expenditure incurred: Project Proponent Informed around INR 143 crore Incurred till date for the development of the green belt.

Date of Site visit: 2 to 7 February 2025

MASTER PLAN OF JSPL RAIGARH



Verified by AADITYA ENVIRONET LLP, RAIPUR, CHHATTISGARH

PART – B

Conclusion and Suggestions

1. Jindal Steel & Power Limited, Raigarh has established a dedicated Environment Management Department (EMD) which continuously monitors all the applicable parameters as stipulated by statutory bodies, which includes air, water, solid waste, hazardous waste etc.
2. A Horticulture Division has been established which maintains green areas on regular basis and should report to EMD.
3. Plantation and greenery can be seen all around the plant premise.
4. The survival rate and the growth of the plantation is very good.
5. The horticulture division has developed their own nurseries where they prepare new plant saplings of different varieties and species.
6. JSPL has invested in vermin-composting of capacity 24 T per month that not only takes care of west, but produces organic manure for supporting such a large area of green cover.
7. It was also observed that the dependency on chemical fertilizers is very less and they prefer their own manure to support their horticultural need.
8. JSPL has established 5 Nos. of sewage treatment plant of total capacity about 5 MLD and bio-methanation plant of capacity 3 TPD. The sludge generated from these plants is used as manure.
9. At JSPL, various plantation sites within the plant area developed as green belt. The green belt can be seen from entrance of factory gate. In plant operation areas also, greenery, lawns and gardens are developed wherever open space is available. Most of the plants are grown up as trees and their survival rate is good.
10. Most of plantations are 10 to 15 years old and in the old plantation sites the plants are grown up as trees. The plantations are done in different phases (years) and it is considered as good practice. The average heights of the plants are 10 to 35 feet.
11. JSPL Raigarh has actively taken part in various green belt and plantation programs organized by local government and Forest Department viz. Operation Oxygen, Operation SIMUNI (Sitafal, Mosambi, Neem), Harihar Chhattisgarh and many more…
12. Old and abandoned dumping sites are reclaimed with top soil, dressing, leveling and dense vegetation cover.
13. The overall impression of the green belt developed under environment management of Jindal Steel & Power Limited seems as they have paid more attention on planting decorative as well as evergreen plants. They have also considered the other species keeping pollution control in mind.
14. The greenery of the plant premise shows the zeal and dedication of the Environment Management Department and they appreciated for such a good job as the place is quit green and well planned that attracts the residents as well as outsiders to visit and spent some time in and around these green areas, which is was unique experience.

Suggestions for improvement:

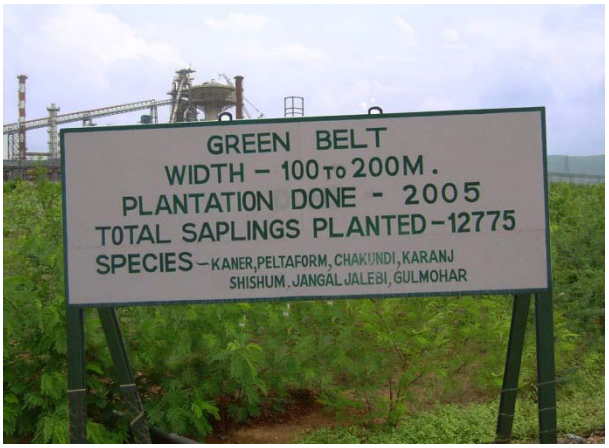
1. The selection of the plants for the development of greenbelt should be focused on their pollution control ability.
2. Crown canopy plants should be preferred for better pollution control.
3. It is advised to minimize the plantation of decorative plants as they have less pollution control values.
4. Plantation and their managements should be a continue practice.
5. Greenbelt should be developed as per the norms of the CPCB.
6. The company should involve and encourage the local villagers/ inhabitant for some useful plantation in their own land. The company may provide some plants and other help for this propose.
7. The company may add plantation work in their CSR, CER activities.

A Word of Appreciation:

M/s Jindal Steel & Power Limited, Raigarh plant management with their EMD team has done extremely well in developing greenery and green belt in their premise. Especially the green belt developed around the boundary walls and surrounding is very good. Their initiative of distributing plants among local villagers and school children is a very good practice in creating awareness among citizens about environment protection. We appreciate Jindal Steel & Power Limited, Raigarh administration and their Environment management department for their commitment and commendable efforts.

KML File where Green color shows Green belt / Plantation area of the total project area.

GLIMPSES OF GREENERY AT JSPL



VERIFICATION OF GREEN BELT / PLANTATION



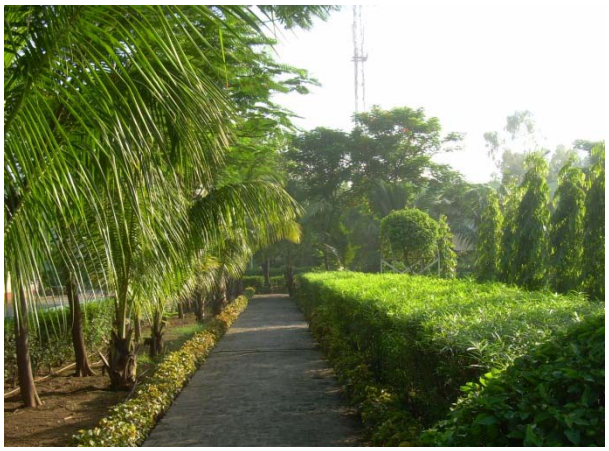












PARTICIPATION IN TREE PLANTATION PROGRAM

पर्यावरण विकास के लिए समर्पित जेएसपीएल

रायगढ़. जिंदल स्टील एंड पावर लिमिटेड उत्पाद की उत्पादकता और गुणवत्ता को बढ़ाने के लिए हरित उत्पादकता की अवधारणा को अपनाने और उसे लागू करने तथा संपूर्ण पर्यावरणीय मापदंडो को पूरा करने के प्रति कृत संकल्प है. उत्पादन तथा सेवा कार्यकलापों के अंतर्गत इस बात का ध्यान रखा जाता है कि संयंत्र परिक्षेत्र प्रदूषण मुक्त तथा कार्यस्थल हरा-भरा, स्वच्छ और सुंदर रहे.

कंपनी के कार्यकारी उपाध्यक्ष एवं प्रबंध निदेशक नवीन जिंदल ने पर्यावरण विकास को कंपनी के सामाजिक कार्यकलापों में सर्वोच्च प्राथमिकता वाले कार्यो में शामिल करते हुए 30लाख स्टील का इरादा 30 लाख वृक्षों का वादा का ध्येय वाक्य दिया है. इस ध्येय वाक्य को धरातल पर मूर्त रूप देने के लिए पर्यावरण विकास के लिये बड़े पैमाने पर परियोजनाएं संचालित है. परिस्थिति की संतुलन हेतु वृक्षारोपण स्वच्छता और उद्यानिकी पर जोर दिया जाता रहा है. जिंदल स्टील एंड पॉवर लिमिटेड पर्यावरण संरक्षण के लिये निरंतर कार्य कर रही है कंपनी द्वारा रायगढ़ से होकर गुजरने वाले छह मुख्य मार्गो के किनारे बड़े पैमाने पर वृक्षारोपण का कार्य किया जा रहा है. छत्तीसगढ़ शासन द्वारा वर्ष 2006 में डॉ. रमन सिंह की अध्यक्षता में एक बैठक आयोजित हुई थी जिसमें राज्य में स्थापित वृहद आकार के उद्योग प्रबंधन को राज्य में पर्यावरण विकास में अपनी सक्रिय भागीदारी निभाने का आव्हान करते हुए 100 किमी लंबाई में मुख्य मार्गो के किनारे पेड़ पौधे लगाने के लक्ष्य निर्धारित किए गए थे. निर्धारित 100 किमी लंबे मार्ग का विवरण इस तरह है रायगढ़ अंबिकापुर

बीस लाख पौध रोपित, तीस लाख वृक्षारोपण का नया लक्ष्य निर्धारित

हरीतिमा की कवायद के लिए कई राष्ट्रीय पुरस्कार

मार्ग 15 किमी, रायगढ़ सारंगढ़ मार्ग 30 किमी, रायगढ़ उड़ीसा मार्ग 13 किमी, रायगढ़ कोतरा रोड वैकल्पिक मार्ग 14 किमी, रायगढ़ खरसिया मार्ग 22 किमी तथा सराईपाली सारंगढ़ मार्ग 10 किमी. इस वर्ष कंपनी ने वन विभाग जिला रायगढ़ छत्तीसगढ़ शासन की ऑपरेशन ऑक्सीजन परियोजना में रायगढ़ जिले में महत्वपूर्ण भागीदारी निभाई है. इस परियोजना के अंतर्गत टीपाखोल पहाड़ी में 5 लाख पेड़ पौधे लगाने का कार्य पूरा कर लिया गया है. पहाड़ी की तलहटी में तरनजोत के पौधे भी रोपित किए गए है. ऑपरेशन ऑक्सीजन के लिए उन्नत प्रजाति के ऐसे पौधों का चयन किया गया है जो तेजी से बढ़ते है तथा छायादार होते है जैसे बरगद, पीपल, सीताफल, आंवला, नीम, रतनजोत, करंज इमली आदि. कंपनी प्रारंभ से पर्यावरण के अंतर्राष्ट्रीय मापदंडों की अनुपालना के लिए कटिबद्ध है. टोटल क्वालिटी मैनेजमेंट पद्धति को अपनाने के लिए उत्सुक है. कंपनी ने क्वालिटी मैनेजमेंट सिस्टम इन्वायरमेंट क्वॉलिटी मैनेजमेंट 5 एस टोटल प्रोडक्टिव मेन्टिनेंस को अपनाया है. ओएचएसएस 18001, एस.ए. 8000, 6 सिगमा आदि पद्धतियों को अपनाने की प्रक्रिया प्रारंभ है. जिंदल स्टील एंड पॉवर लिमिटेड द्वारा किए जा रहे पर्यावरण विकास तथा उर्जा संरक्षण कार्यक्रमों को राष्ट्रीय स्तर पर प्रशंसा और मान्यता मिलती है. पर्यावरण विकास के लिए किए गए उल्लेखनीय कार्यो के लिए कई राष्ट्रीय पुरस्कार मिल चुके है उनमें गोल्डन पीकॉक पर्यावरण प्रबंधन अवार्ड 2002-03 प्रथम पुरस्कार, ग्रीनटेक पर्यावरण उत्कृष्टता अवार्ड 2002-03 रजत पुरस्कार ग्रीनटेक 2005-06 स्वर्ण पुरस्कार सृष्टि ग्रीन क्यूब 2006 प्रथम, उप विजेता गोल्डन पीकॉक इको इनोवेशन अवार्ड 2007 प्रथम पुरस्कार शामिल है.

उद्योग लगाएंगे सड़क किनारे पेड़

इस साल 55 किमी लंबी सड़क पर वृक्षारोपण का काम जारी है। पिछले साल संयंत्र परिसर के आसपास 5.5 लाख पौधे रोपे गए थे। जिंदल स्टील 30 लाख पौधों को रोपने का लक्ष्य तेजी से पूरा काम कर रहा है। बैठक में बालकों की ओर से बताया गया कि कंपनी ने इस साल 50 किमी सड़क पर वृक्षारोपण का लक्ष्य तय किया है। इसके लिए जरूरी धनराशि वन विकास निगम को उपलब्ध कराई जाएगी।

भिलाई इस्पात संयंत्र ने 100 किमी टार्गेट के विरूद्ध 26 किमी पर करीब 40 हजार पौधे रोपे हैं। मुख्यमंत्री ने इस साल 30 किमी सड़क पर वृक्षारोपण के लिए निगम में राशि जमा कराने कहा। एनटीपीसी को 30 किमी लंबी सड़क पर पौधे रोपने चार करोड़ का अनुदान मिला है। उसे 50 किमी लंबी सड़क पर वृक्षारोपण का लक्ष्य देकर आवश्यक राशि निगम के पास 15 अगस्त से पहले जमा करने कहा गया। एसईसीएल ने 22.7 किमी लंबी सड़क के दोनों ओर पौधे लगाने के लिए राशि जमा करा दी है। मुख्यमंत्री ने कुल मिलाकर 100 किमी लंबी सड़क में वृक्षारोपण करने का लक्ष्य हासिल करने कहा है। लाफार्ज सीमेंट ने 12.5 किमी सड़क पर वृक्षारोपण करने का काम शुरू किया है। सेंचुरी सीमेंट ने 5 किमी सड़क पर 5000 पौधे लगाने की जानकारी दी। 20 किमी पर पौधारोपण के लिए राशि जमा कराई जाएगी। इसी तरह कई और कंपनियों ने अपनी उपलब्धियां बताईं।

Few Relevant information of Green Belt Development

Adequate greenery in industrial establishment helps in creating better environment in many ways.

- It provides a sylvan surrounding to improve the aesthetical conditions which, in turn, improves the working condition of the workers.
- Tall trees attract birds to roost and also provide shelter to small creatures like squirrel, snacks etc. thus biodiversity is restored.
- A properly designed green belt of adequate width alts as a filter of our pollutants for outside. Fugitive emissions are mainly controlled by the green belt.
- Plantation of pollution indicating species at strategic locations can indicate the air pollution status of the area. These are plants species which are sensitive to sensitive air pollutants. Such species serves as “bio indicators”.
- Green belt acts as a noise barrier for outside.
- Treated waste water of an industry is always recommended for maximum utilization with in the premises. If the waste water is used for irrigation of green belt and other plantation within, the objective is partially achieved.

Planning of green belt:-

Planting of green belt requires the following considerations:-

1. Choice of the species
2. Design of the belt
3. Width of belt

Choice of the plants species depends upon the nature of fugitive gaseous pollutants coming from the industries. Obviously those plants should be resistant to the pollutants. Besides, trees with large crown are preferred because they served as a good barrier for particulate and gaseous emissions. In between the resistant, species and within the industrial premises, some strategic locations as these species indicate the status of pollution.

The design of the greenbelt should be such that it should form an effective shield against pollutants to outside. A three tier plantation of small medium and large size plants can achieve the same. Typical 50 m width green belt may have 3 layers may consist of bushes (small tree). The inner layer may have large tree with good crown and under growth. The middle layer in between can have bushes and shrubs (small and medium size tree)

The width of the green belt should be carefully & judiciously decided; because of the cost of the land there is always a demand from the industry to a narrow belt. Ideally the width should be such to have maximum attenuation. The attenuation factor can be expressed as:

AF = pollution level at a point a just outside without the greenbelt / pollution level at a with the green belt

The attenuation factor for a well designed green belt attains a limiting value after a certain width and becomes more effective with the increasing height at trees. For the green belt, with Indian trees species (tropical forest species) longer width may not be necessary for maximum attenuation.

Generally for a large industry a belt width of 150 – 200 meters may be adequate but these can be increased where pollution level is high. For a less polluting industry, a belt less then 150 mtr can also do.

The design and nature of green belts will vary according to the place and the type of industry. Some of the factors which influence the design of green belts are-

1. Climatic factors such as wind velocity, temperature, rainfall, sunlight, humidity etc.
2. Assimilation capacity of the ecosystem.
3. Height and canopy of trees.
4. Topography.
5. Size of land available.
6. Distance from source.
7. Soil and Water quality.
8. Nature and extend of pollutants.

Advantages of green belts:

- Noise control- A green belt reduces the intensity of sound. Function as a barrier. Trees can either deflect, refract or may absorb sound to reduce its intensity. The intensity reduction depends on the distance sound has to travel from source. Trees can also modify suitably the humidity and climate which affects sound intensity.
- Help in soil erosion control. Plant species help in improving soil quality and bind soil particles thereby preventing erosion.
- Green belts also help in containing water run offs.
- Climate Control
- Trees help in removing carbon dioxide and other pollutants from air and by release of O2 into the air thereby improving air quality. A green belt development can also help in removing particulate matter from the air by trapping such particulate matter.
- Water Pollution control- Some species can remove some pollutants from water. Example- copper absorbed by *Chlorella vulgaris* and Scandium buy *Astragalas*, zinc by *Typhalatifolia,* chromium by *Salvinianudans*.

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Annexure

LiFE Lifestyle for Environment

क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल

टी.व्ही.टॉवर रोड, जिला–रायगढ़ (छ.ग.)
Email – roraigarh.cecb@gmail.com

जावक क्र. 2330 /क्षे. का./प.सं.मं./2025 रायगढ़, दिनांक 10/01/2025

प्रति,

सूची संलग्न,

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विषय :– माननीय एन.जी.टी. प्रिंसिपल बैंच के प्रकरण क्रमांक 970/2024 के संबंध में कार्ययोजना के परिपालन बाबत्।

संदर्भ :– माननीय एन.जी.टी. द्वारा पारित आदेश दिनांक 25.11.2024.

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उपरोक्त विषयांतर्गत लेख है कि माननीय एन.जी.टी. प्रिंसिपल बैंच के प्रकरण क्रमांक 970/2024 में पारित ओदश अनुसार कार्ययोजना तैयार की गई है। उक्त कार्ययोजना में निम्नलिखित कार्यो का परिपालन 03 माह में किया जाना है :–

01. The third party verification report of plantation should contain the minimum basic information inter-alia including total area of the Industry/Project, area covered under plantation, density of trees, types of species, survival rate, expenditure incurred, layout plan to the scale, duration of verification etc. The audited report should be uploaded on the website of the company with all details as mentioned.
02. The steel unit may also explore the possibility of installation of cement grinding unit for utilisation of locally generated fly ash.
03. Industries must install brick manufacturing unit and explore the possibility of manufacturing of fly ash based product, utilization and for disposal in eco friendly manner.
04. Fly ash generating industry shall effectively comply with regular submission of fly ash utilisation returns and Annual Fly Ash Management Audit report to this office and the same may be uploaded on the website of the Company.
05. Thermal Power Plants shall provid the list of fly ash bricks/block manufacturing plants to which fly ash is provided outside their primises.

उपरोक्तानुसार आवश्यक कार्यवाही कर, की गई कार्यवाही से इस कार्यालय को अवगत कराना सूनिश्चित करें अन्यथा उद्योग पर सूसंगत धाराओं के तहत् कार्यवाही की जायेगी, जिसकी संपूर्ण जिम्मेदारी उद्योग प्रबंधन की होगी।

क्षेत्रीय अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,
रायगढ़ (छ.ग.)

पृ. जावक क्र. /क्षे.का./पर्या.सं.मं./2025 रायगढ़ दिनांक .....

प्रतिलिपि :– 01. सदस्य सचिव, छ.ग. पर्यावरण संरक्षण मण्डल, पर्यावास भवन, नार्थ ब्लॉक, सेक्टर–19, नवा रायपुर, अटल नगर जिला–रायपुर (छ.ग.) की ओर कृपया सूचनार्थ प्रेषित।
02. श्री पी. जगन, क्षेत्रीय निदेशक, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, भोपाल (म.प्र.) की ओर कृपया सूचनार्थ प्रेषित।
03. कलेक्टर महोदय, कार्यालय कलेक्टर, जिला–रायगढ़ (छ.ग.) की ओर कृपया सूचनार्थ प्रेषित।

क्षेत्रीय अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,