ODISHA POWER GENERATION CORPORATION LTD.
(A Joint Venture of Govt. of Odisha & AES Corp. USA)

Ib Thermal Power Station
Banharpali, Dist. : Jharsuguda, Odisha - 768 234, India
Plant Manager : (+916645) 222253, Fax : 222230
Factory Manager : (+916645) 222214, Fax : 222225
Finance : (+916645) 289-214/312
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O/C

OPGC
Power for Progress

Letter No. ITPS/ 475 (A)/WE
November 26, 2020

The Additional Director (S)
Ministry of Environment Forests & Climate Change
Eastern Regional Office
A/3, Chandrasekharpur
Bhubaneswar – 751023

Sub.: Half yearly Environmental Status Report of Odisha Power Generation Corporation (2X210 MW ITPS), Banharpali, Dist: Jharsuguda for the period from April 2020- September 2020.

Ref.: i. ITPS Environmental Clearance No.14/13/83-EM-2, dated 27.09.1984
ii. MoEF & CC Regional Office File No.106-12, dated 11.05.2020

Dear Sir,

This has reference to the above subject and cited references.

Kindly find enclosed the half yearly Environmental Status report of Odisha Power Generation Corporation (2X210 MW ITPS) for the period from April 2020- September 2020.

We have also uploaded the half yearly compliance status for the mentioned period in OPGC *website* ***www.opgc.co.in.*** for your ready reference and kind perusal.

Thanking you

Sincerely yours,

Sukanta Mohapatra
GM(O&M) I/C

Enclosures as above

CC: Member Secretary, State Pollution Control Board, Odisha, Bhubaneswar – 751 012

ANNEXURE-1

ODISHA POWER GENERATION CORPORATION LTD

IB THERMAL POWER STATION (2×210MW)
COMPLIANCE STATUS OF THE ENVIRONMENTAL CONDITIONS
Environment Clearance No. 14/13/83-EM-2, dated 27.09.1984
Period-April 2020- September 2020

Sl. No.	Environmental Clearance Conditions	Compliance Status
1.	**AIR POLLUTION**	
I.	A common stack height not less than 200 meters should be provided for two units of 210 MW. Similarly, for other two units a common chimney of 200 meters height should be provided.	A bi flue common stack of height 220 meters has been provided for U#1&2 of 210 MW each. Unit#3&Unit#4 of capacity 660 MW have been provided with twin flue common stack of height 275 meters each.
II.	ESP of having operational efficiency of not less than 99.7% should be provided and extra fields made part of the design. The efficiency of ESPs should be monitored and recorded. Adequate training should be given to the persons engaged in the operations and maintenance of ESPs.	ESP of operational efficiency 99.82% (designed value) has been provided for both of the units ESP internals both for unit #1 & unit #2 is being repaired during annual overhauling every year. Routine maintenance practice has been followed for ensuring healthiness of ESP. ESP retrofitting job for both the units had been taken up to achieve the particulate emission norm of 100 mg/Nm^3. The maximum, minimum & average PM value for the period from October 2019 to March 2020 is enclosed for kind reference. However, recently Central Pollution Control Board has stipulated to meet 100mg/Nm^3 norm by 30th September 2021 vide Letter No-B-33014/07/2017-18/IPC-11/TPP/15921, dated 11.12.2017, the copy of the letter has been enclosed for kind reference (Enclosed as Annexure-VI).
III.	Emission and ambient air quality monitoring should be done after the commissioning of the units and data recorded and should not exceed the standards set by the Central and State Pollution Control Boards.	Stack monitoring has been taken up through two Nos of online continuous emission monitoring system (CEMS) for parameters PM, SO_2, NO_x & CO for trend monitoring and taking corrective action so as to keep parameters within prescribed limit. The CEMS are connected to SPCB & CPCB servers on real time basis. Offline test is also being conducted through grab sampling by calibrated portable stack monitoring kit & Flue gas analyzers on weekly basis. These results are being recorded and reported. Five permanent ambient air monitoring stations are installed by OPGC in & around ITPS out of which 3 no stations are placed in industrial zone & 2 no in Residential zone. Ambient air monitoring has been done regularly for parameters PM_{10}, $PM_{2.5}$, SO_2, NOx & noise.

		In addition to the above, six online ambient air quality monitoring station has been installed out of which two are inside plant & other two are in residential area to monitor $PM_{2.5}$, PM_{10}, SO_2, & NOx. Real time data transmission to the OSPCB & CPCB servers from the ambient air quality monitoring station has been established. Besides emission, ambient air, noise & waste water quality are being monitored by NABL accredited third party Lab. All the results are furnished in form of maximum, minimum & average values. Monitoring reports are being sent to SPCB & CPCB every month. Half yearly reports are being sent regularly to MoEF & CC, Govt. of India, Eastern Regional Office. Maximum, Minimum and Average Emission data for the period April 2020 to September 2020 is enclosed as Annexure-IV.
IV.	Adequate space for FGD plant should be part of the design so that they could be installed if required at a later stage.	Adequate space provision has been kept for installation of FGD in later stage as per requirement.
V.	Dust suppression / control equipment should be installed in wagon tippling area, transfer points, crushers etc.	As a work zone emission improvement step, OPGC has installed dry fog system with a cost involvement of 2.5 crores in place of existing sprinkling and dust extraction systems in order to bring higher level of fugitive dust control. The effectiveness of the dry fog system has been found very satisfactory.
2.	**WATER POLLUTION**	
I.	Closed cooling system for condensers should be provided instead of once-through cooling system as proposed.	The process has been designed and operated with the closed cooling system.
ii.	Liquid effluents emanating from the different plants such as DM plant, Boiler blow down, Ash pond/dyke sewage etc. should be properly treated as per the standards stipulated by the State Pollution Control Board.	The plant has been reusing its liquid effluents in its different process after necessary treatment since 28.06.2008. This is in compliance to SPCB's consent condition to reuse all liquid effluents. The details of reuse processes are- • Domestic sewage of plant has been discharged to soak pits after treatment in septic tanks. Domestic sewage of colony and hospital has been treated in STP and treated effluent is being reused for watering the Green belt and Park at ITPS. • No effluent from ash pond is discharged. Treated ash water is recycled 100% for reuse as make up water in wet ash handling system after necessary treatment • CW blow down effluent is being reused as make up water in wet ash handling system.

		• Boiler and turbine effluents are being reuse as ash handling make up after necessary treatment. • DM plant regeneration effluent is being reuse as cooling system make up. • CT drift overflow water is recycled back in cooling tower basin. • Gravity sand filter backwash water of WTP is recycled back in clarifier. In abnormal or emergency situation if any liquid effluent discharge situation arises, the industry will ensure the effluents are treated properly (neutralization, settling, equalization, natural cooling and oil removal) and prescribed standards is met before discharged.
iii.	Hot water coming from the condenser should be properly cooled so as to ensure to keep the temperature of the receiving surface water as per the standard stipulated by the state Board.	Hot water coming from the condenser is being cooled through cooling tower & reused for condenser cooling in close loop. Cooling water blow down is being reused as make up water in ash slurry discharge system. There has been no hot water discharge coming from the condensers.
3.	**SOLID WASTE MANAGEMENT**	
i.	Fly ash and bottom ash should be collected in the ash dykes/ponds. The supernatants water should not contain suspended matters more than 100ppm. Dry disposal of fly ash should also be planned including the disposal in abandoned mines after mixing with the OB.	Fly Ash & bottom ash is being collected in Ash Ponds The suspended particles of the supernatant water from ash pond are settled in Primary & Secondary settling tanks The supernatant is also additionally treated with Alum & polyelectrolyte for more effective settling. The settled water is being re-cycled 100% for reuse as make up water in wet ash handling system at plant site. Dry disposal of fly ash is being performed through dry ash handling system with silo provisions specifically for ash utilization in brick, cement, asbestos, land reclamation, road etc. In the period from October 2019 to April 2020, 86.83% of ash has been utilized. In order to meet 100% ash utilization, OPGC needs to have nearest mine void. The requirement was indicated before MCL but no such abandoned mine allotted to OPGC so far On continuous pursuance from OPGC and with the support of MoEF& CC, Regional Office, Mahanadi Coal Field (MCL) had given clearance in the month of May 2007 for back filling of OPGC ash in Lilari OCM void from July 2009 Based on that permission, OPGC had taken immediate step for EIA and feasibility study engaging CIMFR, Dhanbad But in the month of February 2008, the permission was withdrawn unilaterally by MCL on the ground that the anticipated life of Lilari Mine is extended for ten more years. Since then

		OPGC is perusing time and again to MCL to provide any other mine void near OPGC site. In a high-level meeting with MCL on 9th February 2011, MCL has agreed to give in principle clearance to OPGC for back filling in Belpahar OCM. This has not happened so far. In further attempts OPGCL has also awarded a consultancy order to Centre For Fly Ash Research & Management ("C-FARM") headed by Dr. Vimal Kumar (Former Mission Director & Head, Fly-Ash Unit, Department of Science and Technology, Government of India) for scientific and technical advice for obtaining "Consent for mine void filling with fly ash". C-FARM is continuously deliberating with MCL, as well as with Central Mine Planning and Design Institute, on behalf of OPGCL for allotment of mine void for stowing with ash. OPGC further seeks support of MoEF & CC for allotment of mine voids from MCL. However, Odisha Power Generation Corporation Limited has evaluated the feasibility of ash backfilling in underground mine void of Hindegir Rampur Colliery (In the list of mines recommended by the task force constituting of members from CEA, MoEF & CC, Ministry of Mines, CIL, CIMFR, CMPDL, CPCB & NTPC) after site visit and data collected from MCL authorities. It has been found that the mentioned Rampur Colliery mine void is at a distance of about 20 Km from ITPS and can accommodate around 150 Lakh MT of ash which can cater 100% ash utilization for a period of 5 years.
ii.	Green belt should be raised on the ash disposal areas filled by fly ash to check the dispersion by fly ash into the air. Additional land (Pvt. Land) should be acquired for compensatory afforestation.	Dry disposal area (Ash Mounds) is soil capped & grass turffed completely to avoid dispersion of fly ash in the air. The dry ash surface in operational pond is maintained wet or water pounded to prevent air borne of ash. Tree plantation on the slope of the dyke has been restricted by State Pollution Control Board due to the risk involved to the dyke in form of tree root channeling effect. Thereafter, the trees planted earlier on the dykes were removed for maintaining the safety of the ash dykes. Compensatory afforestation has been done by OPGC over 260 Ha of non-forest land in Deogarh, Odisha, through forest department, Govt. of Odisha.
iii.	Trees plantation work should be taken up all around the Thermal Power Plant. The species to be planted may be decided in consultation with the Forest Department.	Adequate number of trees of different species has been planted all around ITPS. Species are selected consulting Forest Department. More than 33% i.e. 34.6% of the plan area is now covered with green belt and high-density tree. This has been confirmed in report of district plantation monitoring committee, constituting of Ex Vice Chancellor & Honorary WL Warden, ACF, Jharsuguda Forest division, A.I

		Horticulture Jharsuguda, Asst Env Engineer Jharsuguda & Chief coordinator Eco-Club Jharsuguda. Survey report of District Plantation Committee conform to 34.6% Greenbelt is enclosed for reference. Plantation activity is also being taken up every year. Detail plantation status is enclosed- **Annexure-V.**
iv.	Effort should be made to utilize fly ash in bricks, blocks, building materials etc.	OPGC is having its own fly ash brick plants (capacity [illegible] bricks/day) for manufacturing of fly ash bricks. Apart from that OPGC has been providing fly ash free of cost to brick plants whoever shows interest to use in manufacturing of building materials. Besides, OPGC also pays Rs 150/- per MT of ash transport to brick manufacturing units. Newspaper publications have been made and pamphlets have been distributed in nearby villages for utilization of ash in low lying areas and in agriculture.
V.	A comprehensive re-settlement package of rehabilitation of dispersed families should be made including providing of job to at least one person per family, apart from giving cultivable land for land to those who were possessing the same.	This was already complied earlier as per our status report no ITPS/241/WE/21.01.2001 submitted in MoEF & CC regional office.
vi.	A master plan should be prepared taking into account the requirement of power plant, township, fuel requirement, human settlements, etc. in consultation with District authorities.	It was compiled at the time of the project construction & commissioning stage during the period from the year 1989 to 1995.
vii.	Timber required for the project should be procured through the Forest Corporation and not by private contractor/dealers and the former should not abrogate this responsibility by contracting the supply out and adding its handling charges. If the corporation is not equipped to handle this themselves the project authorities should negotiate the best terms, price and environment-wise with contractors by obtaining bids.	It was compiled at the time of the project construction & commissioning stage during the period from the year 1989 to 1995.
4	**ADDITIONAL CONDITION FOR MEGA PROJECTS**	
I.	Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) shall be carried out and continuous records maintained. Based on the monitored data, necessary corrective measures as may be required from time to time shall be taken to ensure that the levels are within permissible limits. The results of monitoring shall also be	OPGC has installed 2 Nos of Continuous Emission Monitoring System in both the stacks for online measurement of PM, SO2 & NOx. Similarly, OPGC has installed 6 Nos of Continuous Ambient Air Quality Monitoring System in both industrial & residential location for online measurement of PM10, PM2.5, SO2 & NOx. The data is sent to SPCB/CPCB server on real-time basis

	submitted to the respective Regional Office of MoEF regularly. Besides, the results of monitoring will also be put on the website of the company in the public domain.	Monitoring result is submitted to MoEF &CC regional office along with the half yearly EC status report in form of maximum, minimum and average values. The same is also uploaded in OPGC website on regular basis.
ii.	The six-monthly monitoring reports as well as the monitored data on various parameters as stipulated in the environment clearance conditions shall be put on the website of the company and also regularly updated. The monitored data shall also be submitted to respective State Pollution Control Board/ UTPCCs and regional office of MoEF.	The six monthly as well as monthly monitoring reports on various parameters is being put on OPGC website and regularly updated. The data is also being submitted to OSPCB & MoEF& CC regional office.
iii.	The ambient air quality data as well as the stack emission data will also be displayed in public domain at some prominent place near the main gate of the company and updated in real time.	The ambient air quality data as well as the stack monitoring data are displayed at the Plant gate & are also uploaded in the website of OPGC along with the half yearly status report.

Sukanta Mohapatra
GM (O&M) I/c
OPGC Ltd.

ANNEXURE-II

ODISHA POWER GENERATION CORPORATION LTD

IB THERMAL POWER STATION (2×210MW)

COMPLIANCE STATUS OF CREP GUIDELINES

Period-April 2020- September 2020

Sl No	CREP Guideline	Compliance Status/Steps initiated
1.	Implementation of Environmental standards (emission & effluent) in noncompliant power plants.	Not applicable being compliant plant.
2.	For existing thermal power plants, a feasibility study shall be carried out by CEA to examine possibility to reduce the particulate matter emissions to 100mg/Nm^3.	No such feasibility study report or guideline so far received from CEA. However, as per stipulation by State Pollution Control Board, Odisha, ESP retrofitting job was taken up to achieve revised particulate emission norm, 100 mg/Nm^3 for both the units. Both the unit's ESPs retrofitting job has been completed.
3.	New/expansion power projects to be accorded environmental clearance on or after 1.4.2003 shall meet the limit of 100 mg/Nm^3 for particulate matter.	As per point no. 2, although being an old unit the retrofitting job had been taken up. However, CPCB has asked to achieve the particulate matter limit 100 mg/Nm^3 by 30th September'2021 vide its letter No. B-33014/07/2017-18/IPC-11/TPP/15921, dated 11.12.2017
4.	Development of SO_2 and NOx emission standards for coal-based plants by Dec.2003	MoEF & CC vide their notification dt. 7th December 2015 has issued SO_2 and NOx emission standards for coal based thermal power plants.
	New /expansion power projects shall meet the limit w.e.f. 1.1.2015	As per MoEF & CC notification dt.7th December 2015 the compliance requirement is w.e.f 07.12.2017. However, CPCB vide its letter No. B-33014/07/2017-18/IPC-11/TPP/15921, dated 11.12.2017, has asked OPGC to meet the norm of 100 mg/Nm3 by 30th September 2021 (Letter enclosed for reference).
	Existing power plants shall meet the limit w.e.f.01.01.2006	As per MoEF & CC notification dt. 7th December 2015, the compliance requirement is w.e.f. 07.12.2017. However, CPCB vide its letter No. B-33014/07/2017-18/IPC-11/TPP/15921, dated 11.12.2017, has asked OPGC to meet the norm of 100 mg/Nm3 by 30th September 2021 (Letter enclosed for reference).
5.	Install /activate opacity meters/continuous monitoring systems in all the units by December 31,2004 with proper calibration system.	Continuous emission monitoring system has been installed since June 2005. Calibration is done by comparing offline test results tested through calibrated Stack Monitoring kit.
6.	Development of guidelines/standards for mercury and other toxic heavy metal emissions by December 2003	The standard /guideline for mercury emission as per MoEF & CC notification dt. 7th December 2015 don't cover power generation capacity less than 500 MW.
7.	Review of stack height requirement and guidelines for power plants based on micro meteorological data by June 2003.	Compliance by other agency/authority. However, the stack height requirement i.e. 220 meter is fulfilled.

8.	Implementation of use of beneficiated coal as per GOI Notification.	The matter has been taken to coal supplier, Mahanadi Coal Field Ltd. For supply of washed coal.
9.	Power plants will indicate their requirement of abandoned coal mines for ash disposal and Coal India/MOC shall provide the list of abandoned mines by June 2003 to CEA.	The requirement was indicated before MCL but no such abandoned mine allotted to OPGC so far. On continuous pursuance from OPGC and with the support of MoEF& CC, Regional Office, Mahanadi Coal Field (MCL) had given clearance in the month of May 2007 for back filling of OPGC ash in Lilari OCM void from July 2009. Based on that permission, OPGC had taken immediate step for EIA and feasibility study engaging CIMFR, Dhanbad. But in the month of February 2008, the permission was withdrawn unilaterally by MCL on the ground that the anticipated life of Lilari Mine is extended for ten more years. Since then OPGC is perusing time and again to MCL to provide any other mine void near OPGC site. In a high-level meeting with MCL on 9th February 2011, MCL has agreed to give in principle clearance to OPGC for back filling in Belpahar OCM. This has not happened so far. In further attempts OPGCL has also awarded a consultancy order to Centre For Fly Ash Research & Management ("C-FARM") headed by Dr. Vimal Kumar (Former Mission Director & Head, Fly-Ash Unit, Department of Science and Technology, Government of India) for scientific and technical advice for obtaining "Consent for mine void filling with fly ash". C-FARM is continuously deliberating with MCL, as well as with Central Mine Planning and Design Institute, on behalf of OPGCL for allotment of mine void for stowing with ash. OPGC further seeks support of MoEF & CC for allotment of mine voids from MCL. However, Odisha Power Generation Corporation Limited has evaluated the feasibility of ash backfilling in underground mine void of Hindegir Rampur Colliery (In the list of mines recommended by the task force constituting of members from CEA, MoEF & CC, Ministry of Mines, CIL, CIMFR, CMPDL, CPCB & NTPC) after site visit and data collected from MCL authorities. It has been found that the mentioned Rampur Colliery mine void is at a distance of about 20 Km from ITPS and can accommodate around 150 Lakh MT of ash which can cater 100% ash utilization for a period of 5 years.
10.	Power plant will provide dry ash to the users outside the premises on uninterrupted access to the users within 06 months.	Dry fly ash is being provided to the interested users Availability of adequate quantity of dry ash has been ensured to meet the users demand. OPGC has made 120 MT/day dry ash collection facility which is about 35% of total ash generation quantity.
11.	Power plant should provide dry fly ash free of	Complied. It is being provided free of cost. As per OSPC

	cost to the users.	direction transportation subsidy to the brick manufacturing industry @ Rs.150 per ton has been implemented.
12.	State P.W.Ds/ Construction and development agency shall also adhere to the specification/schedules of C.P.W.D. for ash/ ash based products utilization.	Compliance by other agency/authority.
13.	(i) New plant to be accorded Environmental clearance on or after 01.04.2003 shall adopt dry fly ash extraction or dry disposal system or medium(35 to 40%) ash concentration slurry disposal system or lean phase with 100% ash water recirculation system depending upon site specific environmental situation.	The requirement is incorporated in the design for its expansion project (unit 3 & 4) under construction stage. 100% dry fly ash extraction system and high concentration slurry disposal system with 100% ash water recirculation is envisaged.
	(ii) Existing plant shall adopt any of the systems mentioned in 13(i) by December 2004.	Complied. 35% dry ash collection facility has been provided. 100% ash water is being recirculated for reuse in ash handling.
14.	Fly ash mission shall prepare guide lines/manuals for fly ash utilization by March 2004.	Compliance by other agency/authority.
15.	New plant shall promote adoption of clean coal and clean power generation technologies.	Condition has been considered for Unit#3 & Unit#4

Sukanta Mohapatra
GM (O&M) I/C

Annexure-III

ODISHA POWER GENERATION CORPORATION LTD

IB THERMAL POWER STATION (2×210MW)

ASH GENERATION & UTILIZATION STATUS AT ITPS Period: April 2020-September 2020								
Ash generation in MT	ASH UTILIZATION IN MT							
	Ash Bricks (Own Brick Plant)	Land Reclamation	Asbestos	Cenosphere	Outside Ash Brick Plants	NH/SH Road construction	Ash Dyke raising	Total Utilization
540100	788	195294	2550	42	3675	0	0	202349
% Utilization-37.46% (Low utilization during monsoon)								

Reasons for not meeting the Ash Utilization Target

D. Reasons for variation from the target –

1. Since the plant is situated in a remote location (pit head power plant located in rural area) there is very limited scope of ash utilization in brick manufacturing. More ever utilization in this particular area cannot exceed more than 2% to 3%.

2. Big stone quarry or low lands are not available in the locality.

3. Export of ash is not feasible since the site is located at a distance of 500 Km from the nearest port. Transportation from site to nearest port through rail or any other means is not feasible.

4. No scope available in major ash utilization area i.e. Cement Plant use for production of PPC cement. Only one cement plant is available in the vicinity i.e. M/s Ultratech Cement Ltd. M/s Ultratech off takes entire quantity of ash for cement manufacturing from its sister concern plant i.e. from M/s Aditya Aluminium (Lapanga).

6. Considering OPGC plant's location (Pit Head), mine void back filling of ash is the only means of utilization by which OPGC can achieve 100% ash utilization. The steps so far are as follows.

i. MCL has also been directed repeatedly by OPGC Chairman & Principal Secretary, Energy, Govt of Odisha, managing Director and Director (Operation) but no positive response has so far been received from MCL.

ii. In a meeting held on 24.01.2011 with Principal secretary Energy, Govt. of Odisha. CMD. MCL has given consent to give principal approval for back filling BOCM mind void but the same has not been done, so far.

iii. In response to the letter of Director (Operation), OPGC, dtd.24.08.2013 on the subject, Director (Tech. P&P), MCL neglected the request on the ground of BOCM expansion towards dip slide and no scope to back fill ash in running mine even though OPGC proposed for a partition bund to separate the void space from active mine for ash back filling.

iv. In a high-level meeting held on 13.12.2013 under the Chairmanship of Chief Secretary, GoO, directions for allotment of BOCM mine void to OPGCL were issued to MCL on 03.04.2014 by Dept. of Environment & Forest, GoO. The said directions were for taking expeditious steps on this front. However, there has not been any progress as yet.

v. OPGC sources entire coal from MCL mines. Coal being supplied has high ash content i.e. from 40%-45%. The utilization of this huge quantity of ash has significant cost implication. Any relief on this matter (Like cost pass through in tariff) will be immensely helpful for companies like OPGC.

However, OPGC is still working on high priority to pursue MCL, involving Government & other agency to get newly allotted nearest mine void to fulfill this important regulatory obligation.

Actions to overcome the challenges

Efforts made by OPGCL to Maximise Utilisation of Fly-Ash:

1. OPGCL has installed its own Fly-Ash brick plant with production capacity of 10,000 bricks per day. and steps have been made for all the bricks that are produced being utilised in all the ongoing and upcoming construction activities of OPGC.
2. Further, not only is OPGCL utilizing the Fly-Ash generated from its own Project in its own brick plant, OPGCL is also supplying Fly-Ash to 6 (six) ash brick plants, which are located in and around the site of OPGCL's Project.
3. In order to further incentivise these brick plants to utilise the Fly-Ash from OPGCL's Project. OPGCL has extended a subsidy of Rs 150 per MT for use of Fly-Ash at its cost. However, ash utilization in brick manufacturing is limited to 2-3 % due to poor market demand.
4. OPGCL has entered into an agreement with Visveswariya National Institute of Technology, Nagpur ("**VNIT**") to devise technological advancements for enhancing ash percentage up to 90% in production of bricks and for geopolymeric use of ash in road construction.
5. OPGCL has been conducting various ash utilization awareness campaigns in the nearby community by way of street plays, distribution of pamphlets, etc.
6. Strong initiatives have been taken to identify low lying area/ stone quarries in the vicinity Publications have been made in local newspapers for execution of low land reclamation to supply ash free of cost to the owner for proper utilization of abandoned low land. OPGC now is in process of reclaiming 3 low lying areas of 6.17 acres, 1.28 acres & 1.12 acres for which consent has been taken from State Pollution Control Board, Odisha.
7. Action has been initiated to utilise ash in OPGC expansion project MGR line construction.
8. Working to get mine voids allotment from MCL.
9. Action has been initiated to utilise ash in OPGC expansion project MGR line construction.
10. Working to get mine voids allotment from MCL.
11. OPGCL has ensured that Fly-Ash ash is utilised, instead of precious earth, in the construction of embankment for ash pond as well as raising of bund height for ash pond.
12. Considering OPGC plant's location (Pit Head), mine void back filling of ash is the only means of utilization by which OPGC can achieve 100% ash utilization. For this reason, OPGC has been continuously following up MCL for allotment of mine void, however the allotment of mine void has yet not been materialized. The steps taken so far are as follows.
    i. There was progress on mine void allotment in the year 2006. With the support from Regional Office, MoEF and SPCB, MCL has consented to allot Lilari mine void to OPGC Subsequently, in July 2007, MCL accorded consent for taking up EIA & Feasibility Study for back filling in the void based on which OPGC engaged CIMFR to conduct the studies in October 2007. During the course of the EIA study, the consent given to OPGC was withdrawn by MCL unilaterally vide their letter No MCL-3185/13.02.2008 stating "the life of

Lilari Mine is extended with ten more years". Thereafter, OPGC has been pursuing MCL time and again involving regulatory as well as Govt. to reconsider the withdrawal or consider allotting any other mine void near to OPGC site but there has been no progress.

ii. State Pollution Control Board, Odisha made a proceeding on 05.06.2010 for back filling of OPGC ash in BMC mine void of MCL as alternative solution against allotment of Lilari mine void but no initiative has been taken so far from MCL side.

iii. In response to the letter of Director (Operation), OPGC, dtd.24.08.2013 on the subject, Director (Tech. P&P), MCL neglected the request on the ground of BOCM expansion towards dip slide and no scope to back fill ash in running mine even though OPGC proposed for a partition bund to separate the void space from active mine for ash back filling.

iv. In a high-level meeting held on 13.12.2013 under the Chairmanship of Chief Secretary, GoO, directions for allotment of BOCM mine void to OPGCL were issued to MCL on 03.04.2014 by Dept. of Environment & Forest, GoO. The said directions were for taking expeditious steps on this front. However, there has not been any progress as yet.

v. OPGC sources entire coal from MCL mines. Coal being supplied has high ash content i.e. from 40%-45%. The utilization of this huge quantity of ash has significant cost implication. Any relief on this matter (Like cost pass through in tariff) will be immensely helpful for companies like OPGC.

13. OPGCL has also awarded a consultancy order to Centre For Fly Ash Research & Management ("C-FARM") headed by Dr. Vimal Kumar (Former Mission Director & Head, Fly-Ash Unit, Department of Science and Technology, Government of India) for scientific and technical advice for obtaining "Consent for mine void filling with fly ash". C-FARM is continuously deliberating with MCL as well as with Central Mine Planning and design institute, on behalf of OPGCL for allotment of mine void for stowing ash.

14. A task force has been created by committee comprising representatives from CEA, MoEF &CC, Ministry of Mines, CIL, CIMFR, CMPDIL, CPCB & NTPC. The task force has listed Rampur Colliery as one of the abandoned mines for backfilling of ash nearest to OPGC. In response to the letter of CEA for a feasibility report on mine void filling, OPGC has made a preliminary survey and has found that the Rampur underground mine is at a distance of around 25 Km from the plant and can accommodate ash generated from OPGC for a period of 5 years and it is also feasible for OPGC to dispose ash in the mentioned mine void. OPGC has also proposed the name of BOCM to Central Electricity Authority which can meet the ash utilization requirement of OPGC for atleast a period of 10 years. Once the mine void is made available, OPGC shall take rapid measures to start backfilling of the mentioned mines at the earliest.

Sitaram Sahu
Head-EHS

ANNEXURE

ANNEXURE-IV

ODISHA POWER GENERATION CORPORATION LTD

IB THERMAL POWER STATION

ENVIRONMENTAL MONITORING REPORTS

Period-April 2020 to September 2020

A. STACK EMISSION

PARAMETER	NORM	INTERNAL MONITORING STACK 1 MAX.	STACK 1 MIN.	STACK 1 AVE.	STACK 2 MAX.	STACK 2 MIN.	STACK 2 AVE.	THIRD PARTY MONITORING STACK 1 MAX.	STACK 1 MIN.	STACK 1 AVE.	STACK 2 MAX.	STACK 2 MIN.	STACK 2 AVE.
SPM[mg/Nm³]	100	87	75	83	94	85	90	87	83	85	91	88	89
SOX	NA	1423	1308	1360	1499	1119	1290	1054	1021	1038	1018	976	993
NOX	NA	267	198	225	226	180	204	442	428	435	416	381	401
Hg	NA	-	-	-	-	-	-	0.014	0.011	0.012	0.011	0.01	0.01

B. AMBIENT AIR QUALITY

PARAMETER	NORM	INTERNAL MONITORING MAX.	MIN.	AVE.	THIRD PARTY MONITORING MAX.	MIN.	AVE.
PM_{10} (µg/m³)	100	92	17	41	68	49	58
$PM_{2.5}$ (µg/m³)	60	56	7	20	37	23	31
SO_2 (µg/m³)	80	38	7	11	14	8	12
NO_2 (µg/m³)	80	28	10	19	25	17	21

C. AMBIENT NOISE LEVEL

	INTERNAL MONITORING INDUSTRIAL NOISE LEVEL,dB(A) Day time	Night time	RESIDENTIAL NOISE LEVEL,dB(A) Day time	Night time	THIRD PARTY MONITORING INDUSTRIAL NOISE LEVEL,dB(A) Day time	Night time	RESIDENTIAL NOISE LEVEL,dB(A) Day time	Night time
NORM	75	70	55	45	75	70	55	45
Minimum	66	42	41	36	54	47	42	39
Maximum	71	68	49	42	70	68	56	49
Average	68	64	46	40	65	59	49	43

D. LIQUID INDUSTRIAL EFFLUENT QUALITY

PARAMETERS	UNIT	INTERNAL MONITORING NORM	RESULT MAX.	RESULT MIN.	PARAMETERS	UNIT	THIRD PARTY MONITORING NORM	RESULT MAX.	RESULT MIN.
Temp(In)	°C	T(O) - T(I) = <5°C	-	-	pH	-	6.0 - 9.0	-	-
Temp(Out)			-	-	TSS	PPM	100	-	-
pH at 25°C	NA	5.5-9.0	-	-	O & G	PPM	10	-	-
Chloride as Cl	PPM	1000 max	-	-	BOD	PPM	30	-	-
D.Phos as P	PPM	5.0 max	-	-	COD	PPM	250	-	-
O & G	PPM	10.0 max	-	-	Fe	PPM	3	-	-
TSS	PPM	100 max	-	-	Total Chromium	PPM	2	-	-
TDS	PPM	2100 max	-	-	Copper (as Cu)	PPM	3	-	-
Res chlorine	PPM	1.0 max	-	-	Zinc(as Zn)	PPM	5	-	-
BOD	PPM	30 max	-	-					
COD	PPM	250 max	-	-					

E. STP OUTLET

PARAMETERS	UNIT	THIRD PARTY MONITORING NORM	RESULT MAX.	RESULT MIN.
pH		6.5 - 9	7.5	7.25
TSS	PPM	20	52	42
BOD	PPM	10	8	7
COD	PPM	50	32	24
Total Nitrogen	PPM	10	6.5	5.7
Ammonical Nitrogen	PPM	5	3.8	3.2
Fecal Coliform	MPN/100ml	<100	240	230
Total Coliform	MPN/100ml	5	84	61

Sitaram Sahu
Head (E+S)

Annexure- V (A)

IB THERMAL POWER STATION

SUMMERY OF GREEN BELT & PLANTATION, TILL SEPTEMBER 2019

- **Total Plantation & colony Area-1227.5 acres**
- **Greenbelt & High-Density Trees- 425 acres**
- **% Greenbelt & High-Density Trees- 34.6**
- **Total trees planted- 322699 Nos.**
- **Total trees survived-242944 Nos.**
- **% of survival-75.3**

Plantation & sapling distribution

Year	Planted	Sapling distributed
2012-13	350	2000
2013-14	1300	6000
2014-15	3000	5000
2015-16	700	4480
2016-17	8200	15000
2017-18	1885	4000
2018-19	10725	4600
2019-20	265	4500 *Grafted mango saplings-4000 Nos Forest species trees saplings-500 Nos
2020-21	300	Saplings could not be distributed due to COVID Pandemic

*Compensatory plantation of 260 acres has been done in Deogarh area.

Besides, a nursery of 25000 capacity has been developed

Sitaram Sahu
Head-EHS

Annexure- V (B)

ODISHA POWER GENERATION CORPORATION LTD

IB THERMAL POWER STATION

YEAR WISE TREE PLANTATION DETAILS OF OPGC AT ITPS

Location	Name of Agency	Year	No.of trees planted	Name of the Species	No.of trees alive	Plant Area	Green Belt & High density natural green belt
Colony,Guest House,Helipad, Periphery,Pump House,Filter House,Stores etc. Periphery of Boundary Wall (Green Belt)	Local agencies	1991-92/92-93	12,000	Atopha	9,550		
				Sirish			
				Chhatim			
	O.P.G.C.	1992-93/93-94	38,500	Kadamba	23,300		
				Panash			
		1993-94/94-95		Neem			
Vacant place infront of SBI, Old Hanuman Temple back side of Store yard,colony road side.	Sidhartha agency, Jhersuguda.		23,800	Bottle brush	15,000		
				Bottle Palm			
				Chakunda			
I)Back side of Autobase, Faisamunda village area.	i)Sidhartha agency, Bruluhyaropen	1994-95/95-96	20,000	Jhaun	15000		
				Sisoo			
	Samiti,Jhersuguda.			Golmohar			
II)Coal yard side.either sides of main roads,Plant boundary, Railway lines,inside area between O.M.Plant,R.W.pump house and compound wall.	ii)Departmentally.		37,000	Eucalyptus	31,155		
	Total:-			Gambhari			
				Jarul			
				Litchi			
				Amba			
Both sides of Riv.inline out side the plant boundary and Ash Pond area.	i)Green channel, Brukshyaropan	1995-96/96-97	40,000	Baula			
				Radhachuda			
	Samiti & 3 Nos.of			Deodaru			
	Club and Yubak			Karanja			
	Sangha			Pijuli			
Jhawn &Plantation coal handling plant area & other species on both sides of roads inside plant.	ii)Departmentally		34,500	Saguan			
				Basa			
				Mandar			
				Rangani			
Fuel Oil Pump house area, School,Hospital,Police station Outer periphery of children Parks,Playgrounds etc.			5,500	Areca Palm			
	iii)Local agencies			Juniperous	65,000		
	Total:-			china Palm			
				Mussunda			
Ash Pond	i)Brukshyaropan		5,000	Karabira			
	Samiti			Golap			
	ii)Departmentally		5,000	Thuja			
Both side of Security road.	i)Brukshyaropan		5,000				
	Samiti						
	iii)Departmentally		5,000				
	Total				15,500		
Ash Pond		1998-99/99-00	5,500		4,500		
Ash Pond	By agencies	2000-2001	5,058		5,000		
CHP & Plant	-do-		5,966		4,842		
Colony	-do-		11,500		10,000		
Ash Filling Area(low lying area), Colony,Warehouse,SVM School(ITPS), Rengali School	-do-	2006-07	1,800		1200		
Inside Plant campus	-do-	2007-08	3,000		2300		
Distribution of fruit bearing tree in Periphery villages	-do-	2008-09	4,000	Mango, Lemon	2100		
Block Plantation in association with District Environmental Society	Majhi		3,000	Teak	2500		
Fruit bearing tree plantation at Gujapar and in Schools	do		350	Mango	50		
CHP & Learning Centre on Earth Day	Self	2009-10	120	Neem	75		
World Env Day	Self		150	Mango	90		
Govt. Land near Rengali Nursery	Karunakar Sahu		5000	Neem, Karanja, Kadamba, chakunda etc	2000		
Vatarika & Adhapada Mandir- 150 nos fruit & flower tree, Inside Colony vacant place- 100 neem trees, World Env day- 150 neem & Devdaru tree inside Plant Premises, Gujapahar- 200 Fruit bearing trees, 800 Fruit bearing, Radha Chuda etc planted in Binika & Baneharpali through villagers	Self & through villagers	2010-11	1500	Neem, Devdaru,Radhachura, Mango, Guava, Lemon, Jamun, Coconout, Lichi & Flower Plants	900	1227.5	425
Vacant space in between Boiler area scrap yard & clarifiers	Self	2010-11	100	Neem	70		
Inside Colony Vacant Places	Self	2011-12	150	Mango, Lemon, Guava	100		

Vacant space at Coal Handling Plant	Self	2012-13	350	Neem, Devdaru	200
Distribution of fruit bearing & Forest plant species in Periphery villages, 2000 nos	Self	2012-13	2000	Teak, Mango, Lemon	1000
Avenue Plantation at Banharpali & Ash Pond Road & 100 nos inside Plant premises	Self	2013-14	1300	Kadamba, Limba, Karanga, Radhachuda Teak, Devdaru etc	900
Sapling Distribution, 6000 nos	through nearby villagers		6000	Teak, Guava, Jackfruit, Dalimb etc	3000
Sapling Distribution, 5000 nos	through nearby villagers	2014-15	5000	Teak, Guava, Teak,etc	2500
Block & Avenue Plantation (OPGC old Pump House vacant space , old Adhapada Shiv Temple premises near Banaharpali & Tarini Temple premises at Pump House Para)	Self		3000		1050
Sapling Distribution	through nearby villagers, 4480 nos	2015-16	4480	Teak, Baula, Guava, Lemon, Karanj etc	2100
Plantation inside Plant and Colony	Self		700		650
Plantation inside Plant and Colony	Self	2016-17	200	Baula, Mango	192
Plantation inside Plant	Self		8000	Karanja, Neem, Baula	8000
Saplings Distributed, 15000 nos	Others			Grafted Mango, Guava, Teak, etc	
Plantation inside plant & township * 4000 Nos of mango sapling distributed	Self	2017-18	1885	Kadamba, Neem, Bakul, Siris & Karanja	1880
Gap Plantation	Self	2018-19	10725	Baula, Neem, Karanj, Mango, Arjun, Sisoo, Teak.	10725
Plantation inside Plant and Colony	Self	2019-20	265	Karanj, Neem Bakul	265
Plantation inside Plant and Colony	Self	2020-21	300	Bakul	250
Total			322,699		242,944
% Survival				75.3	
Green Belt				34.9	

In addition to above plantation at ITPS ,Compensatory Afforestation has been done by OPGC over 260 Ha. non-forest land in Deogarh, through Forest Department, Govt. Of Odisha.

Sitaram Sahu
Head-EHS

Annexure-5C

Report of Plantation Monitoring Committee

of the

District Environment Society, Jharsuguda

for the year 2017-18

Report of the Plantation Monitoring Committee of the District Environment Society, Jharsuguda-2017-18.

INTRODUCTION

The Jharsuguda District Environment Society constituted a Plantation Monitoring committee on 30.04.2013 with Prof. D.R. Naik, Former Vice-Chancellor, Sambalpur University and Honorary Wildlife warden for Jharsuguda District as its Chief. The ACF, Jharsuguda Forest Division, the Chief Co-ordinator of the Eco-Club Co-ordination Committee and representatives from the State Pollution Control Board and Horticulture Department were other members. Since then the committee is inspecting industrial premises at least twice every year for monitoring the plantation activity. The report submitted by the committee was discussed in the Review meeting held on 20.12.2016 with the Collector as the Chairman. It was decided that the Plantation Monitoring Committee should inspect the industrial premises and submit its report for further action.

Inspection (2017-18):

The Plantation Monitoring Committee comprising of Prof. D.R. Naik, Former Vice-Chancellor, Sambalpur University and Honorary Wildlife Warden, Sri. P.K. Dhal, ACF, Jharsuguda Forest Division, Sri Prahallad Naik, Chief Co-ordination, Eco-Club Co-Ordination Committee, Sri Devadutta Mohanty, Assistant Environment Engineer, State Pollution Control Board and a representative of the Horticulture Department inspected in the various industrial premises as per the following schedule.

Date	Industries/Mines Inspected
04.10.2017	MCL Lakhanpur Area, OPGC, Banharpali Ltd., TRL, Krosaki Ltd.
07.10.2017	Vedanta (Sesa Starlite) Limited, Ultratech Cement Ltd., Sven Star Steel Ltd., MCL 1b Valley Area, Gobal Coalwashery.
23.08.2017	SMC Power Generation Limited, L.N. Metallic's, MCL Orient Area

General Remarks

(1) It was not intended to conduct the census of trees planted over the years. An overall estimation of the greenery in the accessible areas within the industrial premises was made. In addition, patches of vacant Govt. land outside their premises assigned to some of them for creating 'green belt' were also inspected. Care was taken to note the species of tree planted.

(2) It was found that some of the industries/Mines have not been able to meet the 33.3% mandatory requirement. The concerned industries have been advised to make up the deficiency by the end of 2017-18.

(3) It was noted that some industries have planted trees like Eucalyptus and Acacia over extensive areas. These species are not environment friendly. Hence the concerned industries were advised to undertake intercropping with other species of trees such as Neem, Jamun, Karanja, Simaruba, Jackfruit and such other species with thick foliage and big crown. In due course, Eucalyptus and Acacia may be eliminated.

(4) As Principal Chief Conservator of Forest, Odisha has allotted target of 1,25,000 nos. of seedlings to be planted during 2017-18 under Corporate Sector in Jharsuguda District, a scheme has been prepared by the Divisional Forest Officer, Jharsuguda for raising Urban/ Peri-Urban plantation which will be funded by MCL & Vedanta (Sesa Sterlite) Ltd.. Copy of the scheme has been forwarded to the appropriate authority of MCL & Vedanta (Sesa Sterlite) Ltd. vide Letter No.4411 and Date 14.12.2016 and Letter No.1016 dt. 29.03.2017 respectively. However, MCL Authorities have provided required funds the DFO, Jharsuguda for raising one lakh saplings for plantation in Urban/ Peri-Urban area of Jharsuguda District.

Table showing the Area covered and Number of Saplings planted by various Industries/Mines:

Sl No.	Name of Industries/ Mines	Total land Acquired (Ac)	33.3% of area (Ac)	Land planted (Ac) up to 2016-17	Plantation Achieved during 2017-18		Total area planted inside premises (Ac) up to 2017-18	Total nos. Of saplings planted during 2017-18 (inside & outside)	Remarks/ percentage Achieved
					Inside premises (Ac/No)	Outside premises (Ac/Km)			
1	SMC Power Ltd.	284	94.57	93.8	5.1	0	96.92	2000	34.12%
2	TRL Krosaki	386	128.53	135.0	1.54	0	136.4	1000	35.33%
3	Global Washery	21.17	7.04	7.9	0	0	7.9	0	37.31%
4	Ultratech Cement Ltd.	165.25	55.02	55.02	0	0	55.02	0	33.33%
5	Vedanta (Sesa Sterlite)	2371.0	789.54	615.6	19.0	0	624.6	18000	26.34%
6	OPGC Ltd.	1227.5	408.75	207.0 (210.0 Ac natural forest)	7.0	0	424.0	1000	34.60% (4000 nos seedling distributed)
7	MCL Ib Valley, Area	3474.558	1158.07	458.62	0	0	458.62	0	13.19%
8	MCL Orient, Area	3472.422 (surface braking area= 247.5)	82.41	143.97	0	0	143.97	0	58.16%
9	MCL Lakhanpur, Area	3610.13	1202.17	1084.32	3.51	0	1087.83	5625	30.13%
10	Seven Star Steel	59.0	19.65	21.5	1.62	0	23.12	1200	39.18%
11	LN Metallics	25.41	8.46	12.0	1.4	0	13.4	900	52.73%
							Total: -	29,725	

Comments on the Plantation Activities of Different Industries & Mines:

1. **Ultratech Cement Ltd.:**
   A) Saplings planted on the embankments of the reservoir and along the railway track are well maintained. The 11 acres patch lately planted during the previous season was inspected. The area was inaccessible and filled with grass. This area would be inspected again. They are advised to clean up the tall grass and take adequate care of the saplings.
   B) They have done plantation in the Arda Gramya Jungle (about 4 acres). Many of the saplings are dead. They need to be replaced with neem, Karanj, and such other saplings.
   C) The Avenue plantation from Dhutra village to Badpulia is not visible. Proper maintenance of the saplings is necessary.
   D) No plantation has been taken up during 2017-18.

2. **Seven Star Steels Ltd.:**
   A) Maintenance of plantation sites satisfactory.
   B) Damaged tree-guard/gabion for the Avenue plantation may be repaired/replaced.

3. **LH Metallics:**
   A) Maintenance satisfactory. Care may be taken during the dry season to ensure survival of the saplings planted during the Current year. Fire-line should be maintained to check possible fire accident having summer.

4. **SMC Power Generation Ltd.:**
   A) Maintenance satisfactory. It is nice to see their greenery getting greener. Sustained efforts are necessary to keep it up.
   B) They have a nursery of their own. They are also providing sapling in the neighbouring areas. Preparatory work for the nursery may be started in January. However, the current year plantation work not up to the Mark.

5. **Vedanta (Sesa Sterlite) Ltd.:**
   A) They have done plantation over an extensive area of their ash Pond dyke and in very small patches inside the premises of plant area. The area was inaccessible, but the greenery was visible.
   B) They have developed a nursery. Preparation for the necessary may be started in January.
   C) They may prepare a sketch map showing the green belt and number the different sectors for proper assessment of their greenery.
   D) Plantation done lately during the previous season may be properly maintained before the next inspection.
   E) Spacing between saplings should be 2 m. to 2.5m.
   F) As they have planted very small size seedlings, they have been advised to precure seedlings form Forest Department nursery form next year.

6.OPGC:

A) Maintenance of plantation sites satisfactory.

B) Saplings planted in the extension area are small. Special care need to be taken for their maintenance.

C) They have nursery for their own use and for distribution among the local community

7.Global Coal Washery:

A) Maintenance of plantation sites satisfactory.

B) Plantation in the railway siding remains to be inspected.

8.MCL Ib Valley Area:

A) No plantation has been done by during 2017-18

9. MCL Lakhanpur Area:

A) Plantation sites of 2016-17 satisfactory. Replacement of the dead sapling advised.

B) Plantation of the current season is satisfactory an about 20,000 saplings has been planted.

10.MCL Orient Area:

They reported that they have distributed saplings to different educational institutions. These institutions have to be inspected for on the spot verification. They have planted around 200 saplings in the colony area. They may be assigned Govt. land for plantation.

11.TRL-Krosaki:

A) Plantation satisfactory.

B) They have a well maintained nursery.

(D.K. Naik)
Ex VC & Honorary
WL Warden

(P.K. Dhal)
ADF, Jharsuguda
Forest Division

(A. Lugun)
A.D Horticulture
Jharsuguda

(D.Mohanty)
Asst. Env. Engineer
Jharsuguda

(Prafullad Naik)
Chief Co-ordinator,
Eco Club, Jharsuguda