ODISHA POWER GENERATION CORPORATION LTD.
(A Government Company of the State of Odisha)
CIN: U401040R1984SG001429
Ib Thermal Power Station
Banharpali, Dist.: Jharsuguda, Odisha - 768 234, India
Plant Manager : (+916645) 289266, Fax: (+916645) 222-230
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OPGC
Power For Progress

Letter No. ITPS/6521/WE
November 30, 2023

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 (2X660 MW ITPS), Banharpali, Dist. Jharsuguda for the period from April 2023- September- 2023.**

Ref.: **ITPS Environmental Clearance No. No-J-13011/59/2008 for 2X660 MW Unit#3 & Unit#4 & Subsequent Amendments**

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 (2X660 MW ITPS) for the period from **April 2023- September- 2023**.

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

Thanking you

Sincerely yours,

Manas Ranjan Rout
Director (Operations)/MD in Charge & Occupier

Enclosures as above

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

ODISHA POWER GENERATION CORPORATION LIMITED

2x660 MW Ib Thermal Power Station
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Cl. No.	EC Conditions	Compliance Status
4. (i)	It shall be ensured that natural drainage in the area is not disturbed due to any activity associated with operation or development of the power plant.	The original natural drainage status has been maintained in the project area. The same will not be disturbed in future. In case diversion of any drainage is required in future, permission shall be taken from competent authority.
4. (ii)	The height of the existing ash pond shall not be increased to accommodate fresh disposal of ash slurry.	• The height of the existing ash pond (Ash Pond- A & Ash Pond-B) will not be increased to accommodate fresh disposal of ash slurry from the expansion (Unit 3 & 4). • Ash from Units 3 & 4 shall not be disposed in that time existing ash ponds i.e. (Ash Pond A & B). OPGC has constructed dedicated Ash Pond for its Unit#3 & Unit#4 at Tilia (Phase-1 & Phsase-2 Ash Ponds) which are operational.
4.(iii)	Wildlife conservation plan prepared in consultation with the office of the concerned Chief Wildlife Warden shall be implemented before any expansion activity is undertaken. The status of implementation shall be submitted to the Regional Office of the Ministry within six months and from time to time.	• The Site-Specific Wild Life Conservation Plan (SSWLCP) for the power plant has been prepared and got approved from Chief Wildlife Warden, Odisha on dtd. 12th June 2014. • The payment of amount Rs 6, 62, 92,000 for execution of SSWLCP was made on 18.07.2014 to Odisha CAMPA account. This payment was communicated to Forest Dept; Odisha vide our letter no 2161/WE on Dtd 19.07.2014. • Besides the above, OPGC has already spend Rs 66 lakh towards plantation activities against the plantation requirement mentioned in approved wild life management plan & has planted additional saplings of forest and indigenous species in the FY 2023-24.
4. (iv)	Hydro-geological study of the area shall be reviewed annually, and results submitted to the Ministry and concerned agency in the State Govt. In case adverse impact on ground water quantity and quality is observed, immediate mitigating steps to contain any adverse impact on	• First hydrogeological study was carried out in the year 2014-15. In the study, no such adverse impact was observed. The report was submitted to the Ministry & OSPCB. Thereafter yearly review study has been conducted with no observance of adverse impact so far. • A comprehensive detailed Hydrogeological study covering the plant and ash pond area was carried out during 2018-19 & 2019-20. No adverse impact was observed from the study.

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	ground water shall be undertaken.	• The recent study has been carried out in May'23/June'23 and no adverse condition observed. The report is enclosed as **Annexure-1**. • Piezometers have been installed in existing ash pond and periodic monitoring is being carried out. Six nos. of Bore wells have been constructed in the identified locations covering all directions of the plant and ash pond for collection of water samples.
4. (v)	A twin flue stack of 275 m height shall be provided with continuous online monitoring equipment's for SOx, NOx and RSPM (PM2.5 & PM10). Exit velocity of flue gases shall not be less than 22 m/sec. Mercury emissions from stack shall also be monitored on periodic basis.	• A twin flue stacks of 275 meters height have been constructed with sampling port hole and safe access arrangement for carrying out manual monitoring • 2 Nos of CEMS have been installed at the twin flue stack for monitoring of SO_2, NO_X and PM parameters and real time data being transferred to SPCB & CPCB. • Exit velocity of flue gas has been maintained more than 22 m/sec. • Mercury emission and other emission parameters (PM, SO2 & NOx) of flue gas is being monitored periodically from January 2020 onwards through NABL accredited Lab and reports are being submitted. OPGC is also in process of purchasing online mercury analysers for its Unit#3 & Unit#4.
4. (vi)	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm3.	High efficiency ESPs are designed and installed to ensure PM emission less than 50 mg/Nm3.
4. (vii)	Adequate dust extraction system such as cyclones/ bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other	• Dust extraction systems (Bag Filters) have been provided at Crusher House, Boiler Bunkers, Transfer Towers and vents of Ash Silos to control the fugitive dust emission.

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	vulnerable dusty areas shall be provided.	• Dust Suppression Systems (DSS- Dry Fog and Water sprinkling) have been installed at Track hopper, Transfer towers. • Rain Gun type water sprinkling systems have been installed at Coal stock yard to control fugitive emission during stacking and reclamation of coal.
4. (viii)	Utilisation of 100% Ash generated shall be made from 4th year of operation of the plant. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.	• Shall be complied. • Ash utilization status for the FY 2022-23 has been reported to MoEF & CC / CPCB/SPCB vide e mail dated 29.04.2023.
4. (ix)	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized fly ash shall be disposed of in the ash pond in the form of slurry form. Mercury and other heavy metals (As, Hg, Cr, and Pb etc.) will be monitored in the bottom ash as also in the effluents emanating from the existing ash pond. No ash shall be disposed of in low lying area.	• Pneumatic conveyer system with 3 nos of dry ash storage silos have been constructed with capacity of 2300 M3 each for storage of ash and for its further utilisation and disposal. • Unutilised fly ash is being disposed in the ash pond through HCSD system and Bottom ash is being disposed through LCSD system. • Effluent emanating from the existing ash pond is being recycled and reused for fresh slurry making. No ash pond effluent is being discharged outside. The heavy metal in ash and nearby ground water is being monitored periodically, test reports are enclosed as **Annexure-6** for kind reference. • No ash shall be disposed in low lying area without taking consent from OSPCB.
4. (x)	Ash pond shall be lined with HDP/LDP lining or any other suitable impermeable media such that no leachate takes place at any point of time. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached.	HDPE lining has been provided in the ash pond. Dyke safety measures has been addressed during design and construction of ash pond to protect the ash dykes from getting breached. During operation of ash pond, adequate safety measure will also be implemented to avoid breaching of ash dykes.

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4. (xi)	For disposal of Bottom Ash in abandoned Manoharpur mines it shall be ensured that the bottom and sides of the mined-out areas are adequately lined with clay before Bottom Ash is filled up. The project proponent shall inform the State Pollution Control Board well in advance before undertaking the activity.	The requirement will be implemented, and approval/ clearances will be taken from State Pollution Control Board before undertaking filling of mine void using ash.
4. (xii)	Closed cycle cooling system with natural draft cooling towers shall be provided. The Effluents shall be treated as per the prescribed norms.	• Considering the ambient conditions, the plant has been designed with induced draft cooling tower. This deviation request was submitted to Director (Thermal), MoEF vide letter No.565 dated 8 -March-2010 • Considering our request, MoEF has granted its permission for use of Induced Draft Cooling System via EC Amendment dated 22/01/2014. The permission is enclosed as **Annexure 3** • The blow down of the IDCT is being utilised in ash handling and dust suppression purpose.
4. (xiii)	COC 5.0 will be adopted.	Being Complied
4. (xiv)	The treated effluents conforming to the prescribed standards only shall be re-circulated and reused within the plant. There shall be no discharge outside the plant boundary except during monsoon. Arrangements shall be made that effluents and storm water do not get mixed.	• 200X2 m3/hour ETP has been installed for treatment and utilisation of waste water generated from the plant. • Zero effluent discharge is being adhered. Effluent drains have been segregated from the Storm water drains.
4. (xv)	A sewage treatment plant shall be provided, and the treated sewage shall be used for raising greenbelt/plantation.	• 1 MLD capacity Sewage Treatment Plant has been provided for treatment of sewage generated from colony and office buildings of OPGC. • Treated sewage is being used for raising greenbelt/plantation.

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4. (xvi)	Rainwater harvesting should be adopted. Central Groundwater Authority/ Board shall be consulted for finalization of appropriate rainwater harvesting technology within a period of three months from the date of clearance and details shall be furnished.	• The detail study on rain water harvesting technology has already been completed in May-2012 and the report is already finalised. The same was submitted to Central Ground Water Board for review and advice vide letter No. 1612/WE dated 28-June 13. After compliance submission against the observation raised by CGWB and further verification, finally approval accorded by CGWB vide letter no – 5-22/SER/CGWA/2017-18-1455 on dated 07.12.2017. After getting the approval of the technology, the rain harvesting pond design was carried on and construction completed in May'22.
4. (xvii)	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with location plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.	• Details of fire protection arrangement at coal yard with lay out map has been submitted to Regional Office, MoEF & CC • Adequate fire hydrant system has been installed in the Coal stock yard and Track hopper site to control spontaneous fire. • Coal stock yard is being managed through first in first out method to reduce spontaneous combustion. • Compaction of coal stock pile is being done at regular intervals to reduce spontaneous combustion.
4. (xviii)	Storage facilities for auxiliary liquid fuel such as LDO and/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur co ntent in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an	• Storage facilities for auxiliary liquid fuel has been made in consultation with Dept. of Explosive, Nagpur. Further, the facilities have been brought into operation after getting valid license from Dept. of Explosive, Nagpur. • As regards to Sulphur content, EAC (Thermal) in its monthly meeting held on 18th/19th November 2013 has accorded its consent for the use of commercially available fuel oil.

Cl. No.	EC Conditions	Compliance Status
	accident taking place due to storage of oil.	• Emergency response plan has been prepared to handle any emergency
4. (xix)	Regular monitoring of ground water (especially around ash pond and plant areas) shall be carried out by establishing a network of existing wells and constructing new piezometers. Monitoring around the ash pond area shall be carried out particularly for heavy metals (Hg, Cr, As, Pb) and records maintained and submitted to the Regional Office of this Ministry. The data so obtained should be compared with the baseline data so as to ensure that the ground water quality is not adversely affected due to the project.	• Piezometers have been installed in existing ash pond and 6 nos of Bore wells have been constructed in the identified locations covering all directions of the plant and ash pond for collection of water sample. • Periodic monitoring for heavy metals is being carried out in the ground water samples from ash pond and surrounding area and reports are being submitted to the Regional Office. • The analysis of the ground water samples near the existing ash pond & nearby surrounding villages' shows that the concentration of heavy metals is within the permissible limits. Reports enclosed as **Annexure-1** for kind reference
4. (xx)	Monitoring surface water quantity and quality shall also be regularly conducted, and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall be undertaken.	Surface water and ground water quality monitoring is being done regularly. The points for monitoring in the direction of flow of ground water has been determined from the Hydro geological report and monitoring is being carried out accordingly.
4. (xxi)	Green Belt consisting of 3 tiers of plantations of native species around plant and at least 100 m width shall be raised. Wherever	• The requirements are addressed in the drawing number D-56 (already submitted on 30th November 2011). • District Plantation monitoring committee lead by Ex. Vice Chancellor Sambalpur University & Wild Life Warden

Cl. No.	EC Conditions	Compliance Status
	100 m width is not feasible a 50 m width shall be raised, and adequate justification shall be submitted to the Ministry. Tree density shall not less than 2500 per ha with survival rate not less than 70 %.	along with Additional Chief Conservator of Forest, Asst. Director Horticulture, Asst. Environment Engineer OSPCB & Chief Co-ordinator Eco Club of Jharsuguda has verified the plantation/green belt status through site visits which comes to be 34.6% till Feb'18 (More than 12000 samplings have been planted since Feb'18 till date as gap plantation and increasing density of existing green belt & current green belt % is 34.81%) • The District Plantation committee report mentioning 34.6% green cover is enclosed as **Annexure-4** for reference. Detailed Plantation report enclosed as **Annexure-5**
4. (xxii)	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	Construction phase has been completed, however fully equipped 18 bedded Hospital has been established inside the campus for health care of workers. Annual Health check-up of all labours is also being carried out in the same Hospital.
4. (xxiii)	Noise levels emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 75 dBA. For people working in the high noise area, requisite personal protective equipment like earplugs/ear muffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non-noisy/less noisy areas.	• Arrangements for control of noise in the working areas have been taken in the plant by provision of acoustic enclosures, silencers etc. Sufficient ear protection PPE is provided for all personnel exposed to work in noisy area. • Periodic/ Annual health check is carried out for all employees & contractor partners.
4. (xxiv)	Regular monitoring of ground level concentration of SO_2, NO_X, RSPM ($PM_{2.5}$& PM_{10}) and Hg shall be carried out in the impact zone and records maintained. If	The project is located inside the existing plant premises. Six online CAAQ monitoring stations to monitor PM10, PM2.5, SO2, NOx & CO has been installed within impacted zone. Results are transmitted to SPCB & CPCB server on real

Cl. No.	EC Conditions	Compliance Status
	at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.	time basis. Other than this, Ambient Air Quality is also being monitored through five permanent offline ambient air quality stations and the location of the stations are decided earlier in consultation with the Regional Office. Periodic monitoring is being performed for ambient Hg. Necessary control measures shall be implemented in case any exceedances are observed. Monitoring reports are being submitted on periodic basis (The monitoring details have been summarized in **Annexure-6** for the period from April'23 to September'2023)
4. (xxv)	A good action plan for R&R (if applicable) with package for the project affected persons be submitted and implemented as per prevalent R&R policy within three months from the date of issue of this letter.	R & R plan is not applicable as there is no displacement of people due to establishment of the project.
4. (xxvi)	An amount of Rs 24.36 Crores shall be earmarked as one-time capital cost for CSR programme. Subsequently a recurring expenditure of Rs 4.87 Crores per annum shall be earmarked as recurring expenditure for CSR activities. Details of the activities to be undertaken shall be submitted within one month along with road map for implementation.	A revised /updated list of projects amounting to Rs. 26.91 Crores has been approved by the CSR committee in its 22nd meeting dated 06th April 2019. A copy of the updated list of projects is attached herewith which includes projects that are completed, in progress and yet to start. (**Annexure -7**).
4. (xxvii)	As part of CSR programme the company shall conduct need-based assessment for the nearby villages to study economic measures with action	Need based assessment have been conducted by CSR team of OPGC which was followed by a baseline survey taken up by a professional agency. The project list of Rs. 26.91 Crores provides the details of projects to be

Cl. No.	EC Conditions	Compliance Status
	plan which can help in upliftment of poor section of society. Income generating projects consistent with the traditional skills of the people besides development of fodder farm, fruit bearing orchards, vocational training etc. can form a part of such programme. Company shall provide separate budget for community' development activities and income generating programmes. This will be in addition to vocational training for individuals imparted to take up self-employment and jobs.	undertaken for development of local people as per their expressed needs and priorities.
4. (xxviii)	The project proponent shall also adequately contribute in the development of the neighbouring villages. Special package with implementation schedule for providing fluoride free potable drinking water supply in the nearby villages and schools shall be undertaken in a time bound manner.	This remains high on OPGC'S agenda. The approved project list sheds adequate light on how OPGC has planned elaborately to provide lasting and sustainable water solutions to people of nearby villages. A scientific Hydrology study was conducted to guide the process of project implementation. OPGC has also started mobilising people's opinion and support for sustainable water solutions in collaboration with experts and Jharsuguda district authority.
4. (xxix)	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary	Construction phase has been completed.

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	structures to be removed after the completion of the project.	
4. (xxx)	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in.	Complied. Published in Sambad (Odiya) & New India Express (English) in March 2010.
4. (xxxi)	A copy of the clearance letter shall be sent by the proponent to concern Panchayat, ZilaParisad / Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/representations, if any, received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Complied in March 2010.
4. (xxxii)	A separate Environment Management Cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards.	A separate Environment Management Cell with qualified staff has already been functioning for the purpose.

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4. (xxxiii)	The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely, RSPM, S02, NOx (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.	• The status of compliance is being uploaded in Website and reports are also being sent to the said offices. • 2 Nos of LED display boards are installed at the Plant main gate for display of environmental information. **Website path** http://www.opgc.co.in/env/half_comp_powerplant.asp
4. (xxxiv)	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well by e- mail) to the respective Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB.	This is being complied since October 2010.
4. (xxxv)	The environment statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall	Annual Environment Statement (Form-V) of 2X660 MW for the FY 2021-22 had been submitted to OSPCB & MoEF & CC regional office vide ITPS Letter No. 5169/WE, dated 22.09.2021 and web-hosting of Environment Statement has also been done. Environment Statement for FY 2022-23 will be submitted before 30.09.2023. **The annual report for the FY 2022-23 has been enclosed as Annexure-9**

Cl. No.	EC Conditions	Compliance Status
	also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.	
4. (xxxvi)	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of' the environmental clearance conditions on their website and update the same periodically and simultaneously send the same bye-mail to the Regional Office, Ministry of Environment and Forests.	• Reporting already commenced since October 2010. The compliance report is being sent to Ministry of Environment and Forests, its Regional Office, Central Pollution Control Board, State Pollution Control Board and the Regional Office, OSPCB. • Web hosting of EC Compliance status is being done. **Website path** **http://www.opgc.co.in/env/half_comp_powerplant.asp**
4. (xxxvii)	Regional Office of the Ministry of Environment & Forests will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use	• Reporting already commenced since October 2010. • Web-hosting of compliance of stipulated in the EC conditions being done. • Criteria pollutants levels NOx (from ambient air and stack) is being displayed at the main gate of the power plant.

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	during monitoring. Project proponent will up-load the compliance status in their website and up-date the same from time to time at least six-monthly bases. Criteria pollutants levels including NOx (from stack & ambient air) shall be displayed at the main gate of the power plant.	
4. (xxxviii)	Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These costs shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	The project cost includes the provision for implementation of environmental protection measures as required. It is made strictly for environment protection measure.
4. (xxxix)	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant.	The financial closure of the project was done on 23rd November 2012. NTP was issued to BHEL and BGRE on 26th March 2014.
4.(xxxx)	Full cooperation shall be extended to the Scientists/Officers from the Ministry / Regional Office of the Ministry at Bangalore / CPCB/ SPCB who would be monitoring	It is being done.

Cl. No.	EC Conditions	Compliance Status
	the compliance of environmental status.	
Additional Recommendations to OPGCL by MoEF in EC amendment dated 22.01.2014		
S. No	**Recommendations**	**Compliance status**
a	A long-term study of radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter, mechanism for an inbuilt continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	Coal & Ash samples have been sent to BRIT for radio activity analysis of Coal/fly ash and results are awaited, we have analysed the heavy metal content of Coal & Ash through Institute of Minerals & Materials Technology Bhubaneswar and results are enclosed as **Annexure-8** for reference.
b	Continuous monitoring for heavy metals in and around the existing ash pond area shall be immediately carried out by reputed institutes like IIT Kanpur.	The monitoring has been periodically carried out through reputed and accredited agency (M/S SGS India Ltd., Visiontek Consultancy Services,)/Institutions (IIT, Chennai)
c	Harnessing solar power within the premises of the plant particularly at available roof tops shall be undertaken and status of implementation shall be submitted periodically to the Regional Office of the Ministry.	Complied. Details of renewable energy initiatives of OPGC has been enclosed as **Annexure-10**
d	Fugitive emissions shall be controlled to prevent impact on	• Adequate fugitive dust control measures had been implemented to prevent impact during construction phase

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	agricultural or non-agricultural land.	• Adequate dust suppression systems (water sprinklers & Dry Fog) have been installed to suppress fugitive dust in coal and ash handling area for the operational stage • Mechanized road sweeping machines deployed for filtering loose dust from the roads.
e	No ground water shall be extracted for use in operation of the power plant even in lean season.	Ground water is not being used. All requirement of water is met from Hirakud reservoir.
f	Minimum required environmental flow suggested by the Competent Authority of the State Govt. shall be maintained in the Channel/ Rivers (as applicable) even in lean season.	Minimum required environmental flow is being maintained as per the water agreement with Water Resource Department.
g	No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up/operation of the power plant.	No water bodies have been disturbed due to project and will not be disturbed in future due to operation.
h	Fly ash shall not be used for agricultural purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, prior detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the State	• No ash generated is used for agricultural purpose at present. • For mine void filling of ash, prior detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained in close co-ordination with the State Pollution Control Board.

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	Pollution Control Board and implementation done in close co-ordination with the State Pollution Control Board.	
i	Three tier green belts shall be developed all around Ash Pond over and above the Green Belt around the plant boundary.	• Green belt already exists all along the plant boundary. Details stated in condition no 4.xxi: • For Ash Pond, SPCB Odisha advised not to go for any plantation on the ash pond dykes looking towards the risk of dyke failure due to tree root channelling. However, the entire ash dykes are turffed with grass to avoid any raincuts. • However, adequate water sprinkling arrangement has been made in the Ash Ponds for control of fugitive dust emission.
j	A common Green Endowment Fund shall be created, and the interest earned out of it shall be used for the development and management of green cover of the area.	complied.
k	It shall be ensured that in-built monitoring mechanism for the schemes identified is in place and annual social audit shall be got done from the nearest government institute of repute in the region. The project proponent shall also submit the status of implementation of the scheme from time to time.	• Baseline Survey has been completed by Sutra Consultancy Services, Bhubaneswar and the Final report is already available with OPGC. Monitoring is regularly done by OPGC CSR team. • Projects are currently under execution and effectiveness of implementation will be audited through Govt. Institute.
l	An Environmental Cell shall be created at the project site itself and shall be headed by an officer of the company of appropriate seniority and qualification. It shall be ensured that the head of the Cell shall	A separate Environment Management Cell with qualified staff has already been functioning for the purpose. A senior qualified officer heads the Cell (EHS Head) who directly reports to Unit Head (Occupier).

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	directly report to the Head of the Organization.	
m	The project proponent shall formulate a well laid Corporate Environment Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.	OPGC has got well formulated EHS Policy. Also identified and designated responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations. (EHS Policy Enclosed as **Annexure-11**)

Prepared By:

Parthasarathi Panda
Sr.Manager (Environment)

Head of Organization:

Manas Ranjan Rout
Director (Operations)/MD in Charge & Occupier
OPGC Limited

HYDROGEOLOGICAL STUDIES

Of

ASH POND, PLANT SITE AND ITS SURROUNDING AREAS

At

Near village Banharpali,

Tehsil Lakhanpur, District Jharsuguda, Odisha

Project Proponent

ODISHA POWER GENERATION CORPORATION LIMITED

Prepared By

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BY SPEED POST

J-13011/59/2008 -IA.II (T)
Government of India
Ministry of Environment & Forests

Paryavaran Bhawan
CGO Complex, Lodi Road
New Delhi-110 003
Dated: 22.01.2014.

To

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Odisha.

Ph: 0674-2303765; Fax; 0674-2303755/56

Sub: Expansion of existing Coal Based Thermal Power Plant by addition of 2x660 MW (Unit 3 & 4) at Village Banaharpalli, in Jharsuguda Distt., in Orissa by M/s Odisha Power Generation Corporation Ltd. – reg. Amendment and Extension of validity of Environmental Clearance.

Sir,

This has reference to your letters dated 05.06.2013 and 18.09.2013 requesting for amendment and extension of validity of environmental clearance accorded for the above mentioned project.

2. The matter was placed before the Expert Appraisal Committee (Thermal Power) in its 4th Meeting held during November 18-19, 2013. In acceptance of the recommendation of the Expert Appraisal Committee (Thermal Power) and in view of the information/clarification furnished by you, with respect to the above mentioned power project, the following amendments are made in two conditions i.e. (xii) & (xviii) specified in the earlier EC accorded to you vide our letter of even no. dated 04.02.2010.

a) The condition no. (xii) of Para No.4 shall be read as *"Closed cycle cooling system with induced draft cooling towers shall be provided. The Effluents shall be treated as per the prescribed norms"* **instead of**

"Closed cycle cooling system with natural draft cooling towers shall be provided. The Effluents shall be treated as per the prescribed norms."

b) The condition no. (xviii) of Para No.4 shall be read as *"Storage facilities for auxiliary liquid fuel such as LDO and/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil"* **instead of**

"Storage facilities for auxiliary liquid fuel such as LDO and/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil."

3. Further, under Para no.4 of this Ministry's letter of even no. dated 04.02.2010, after the condition no. (xl), the following conditions shall be inserted:

(xli) A long term study of radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter, mechanism for an in-built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.

(xlii) Continuous monitoring for heavy metals in and around the existing ash pond area shall be immediately carried out by reputed institutes like IIT Kanpur.

(xliii) Harnessing solar power within the premises of the plant particularly at available roof tops shall be undertaken and status of implementation shall be submitted periodically to the Regional Office of the Ministry.

(xliv) Fugitive emissions shall be controlled to prevent impact on agricultural or non-agricultural land.

(xlv) No ground water shall be extracted for use in operation of the power plant even in lean season.

(xlvi) Minimum required environmental flow suggested by the Competent Authority of the State Govt. shall be maintained in the Channel/ Rivers (as applicable) even in lean season.

(xlvii) No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up/operation of the power plant.

(xlviii) Fly ash shall not be used for agricultural purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, prior detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the State Pollution Control Board and implementation done in close co-ordination with the State Pollution Control Board.

(xlix) Three tier green belt shall be developed all around Ash Pond over and above the Green Belt around the plant boundary.

(l) A common **Green Endowment Fund** shall be created and the interest earned out of it shall be used for the development and management of green cover of the area.

(li) It shall be ensured that in-built monitoring mechanism for the schemes identified is in place and annual social audit shall be got done from the nearest government institute of repute in the region. The project proponent shall also submit the status of implementation of the scheme from time to time.

(lii) An Environmental Cell shall be created at the project site itself and shall be headed by an officer of the company of appropriate seniority and

qualification. It shall be ensured that the head of the Cell shall directly report to the Head of the Organization.

(liii) The project proponent shall formulate a well laid Corporate Environment Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.

4. All other conditions mentioned in this Ministry's letter of even no. dated 04.02.2010 shall remain the same.

5. Regarding the extension of validity of environmental clearance, since the validity will only expire in Feb, 2015, you may request this Ministry along with updated Form-I only before 6 months from expiry of the validity of EC, if required.

This issues with the approval of the Competent Authority.

(Dr. Saroj)
Director

Copy to:

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110001.
2. The Secretary (Environment), Environment Department, Government of Orissa, Bhubaneshwar.
3. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
4. The Chairman, Orissa State Pollution Control Board, A-118, Nilkanta Nagar, Unit – VIII, Bhubaneshwar- 751 012.
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi- 110032.
6. The Chief Conservator of Forests, Regional Office (EZ), Ministry of Environment & Forests, A/3, Chandesekhapur, Bhubaneswar – 751023.
7. The District Collector, Jharsuguda District, Orissa.
8. Guard file.

(Dr. Saroj)
Director

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. DR. 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 Sterlite) Limited, Ultratech Cement Ltd., Sven Star Steel Ltd., MCL Ib 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. **LN Metallic's:**
   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- Sterilite) 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.R. Naik) Ex VC & Honorary WL Warden	(P.K. Dhal) ACF, Jharsuguda Forest Division	(A. Lugun) A.D Horticulture Jharsuguda	(D.Mohanty) Asst. Env. Engineer Jharsuguda	(Prahallad Naik) Chief Co-ordinator, Eco-Club, Jharsuguda

Annexure- V (A)

IB THERMAL POWER STATION

SUMMERY OF GREEN BELT & PLANTATION, TILL SEPTEMBER 2023

- Total Plantation & colony Area-**1227.5 acres**
- Greenbelt & High-Density Trees- **426.25 acres**
- % Greenbelt & High-Density Trees- **34.73**
- Total trees planted- **324749 Nos.**
- Total trees survived-**245044 Nos.**
- % of survival-**75.5**

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
2021-22	200	1000 Fruit Bearing trees
2022-23 (till Mar'23)	850	1000 Fruit Bearing trees
2023-24 (Till Sep'23)	900	3000 Fruit Bearing Trees

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

Besides, a nursery of 25000 capacity has been developed

Parthasarathi Panda
Sr. Manager Environment

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,Halipad,	Local agencies	1991-92/92-93	12,000	Akashia	9,550		
Periphery,Pump House,Filter				Sirish			
House,Stores etc.				Chhatim			
Periphery of Boundary Wall	O.P.G.C.	1992-93/93-94	38,500	Kadamba	23,300		
(Green Belt)				Panash			
Vacant place infront of SBI,	Sidhartha agency,	1993-94/94-95		Neem			
Old Hanuman Tample back	Jharsuguda.		23,800	Bottle brush	15,000		
side of Store yard,colony road				Bottle Palm			
side.				Chakunda			
i)Back side of Autobase,	i)Sidhartha agency,	1994-95/95-96	20,000	Jhaun	15000		
Falsamunda village area.	Brukshyaropan			Sisoo			
	Samiti,Jharsuguda.			Golmohar			
ii)Coal yard side,either sides	ii)Departmentally.		37,000	Eucalyptus	31,155		
of main roads,Plant boundary,	Total:-			Gambhari			
Railway lines,inside area bet-				Jarul			
ween D.M.Plant,R.W.pump				Litchi			
house and compound wall.				Amba			
Both sides of Rly.inline out	i)Green channel,	1995-96/96-97	40,000	Baula			
side the plant boundary and	Brukshyaropan			Radhachuda			
Ash Pond area.	Samiti & 3 Nos.of			Deodaru			
	Club and Yubak			Karanja			
	Sangha			Pijuli			
Jhawn &Plantation coal hand-	ii)Departmentally		34,500	Saguan			
ling plant area & other species				baxa			
on both sides of roads inside				Mandar			
plant.				Rangani			
Fuel Oil Pump house area,	iii)Local agencies		5,500	Areca Palm			
School,Hospital,Police station	Total:-			Juniperous	65,000		
Outer periphery of children				china Palm			
Parks,Playgrounds etc.				Musunda			
Ash Pond	I)Brukshyaropan		5,000	Karabira			
	Samiti			Golap			
	ii)Departmentally		5,000	Thuja			
Both side of Security road.	I)Brukshyaropan		5,000				
	Samiti						
	ii)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 & Banaharpali 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 & Tarrini 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	300			
Plantation inside Plant and Colony	Self	2021-22	200	Bakul, Neem, Karanj, Sisoo	200			
Plantation inside Plant and Colony	Self	2022-23	950	Terminalia, Baula, Neem, Karanja, Arjun	950		**1.25**	Total Area of Green Belt
Plantation inside Plant and Colony	Self	2023-24 (Till Sep'23)	900	Terminalia, Baula, Neem, Kanchan	900		**1**	
Total			**324,749**		**245,044**		**427.25**	
% Survival				**75.5**				
Green Belt%				**34.81**				

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.

Parthasarathi Panda
Sr. Manager Environment

ANNEXURE-IV

ODISHA POWER GENERATION CORPORATION LTD

IB THERMAL POWER STATION

ENVIRONMENTAL MONITORING REPORTS

Period-April 2023 to September 2023

A. STACK EMISSION

		INTERNAL MONITORING						THIRD PARTY MONITORING					
PARAMETER	NORM	STACK 3			STACK 4			STACK 3			STACK 4		
		MAX.	MIN.	AVE.	MAX.	MIN.	AVE.	MAX.	MIN.	AVE.	MAX.	MIN.	AVE.
SPM(mg/Nm^3)	100	40	35	37	36	31	34	39.04	33.3	36.31	45.1	30.3	38
SOX	NA	925	893	912	946	909	927	956	943	950	965	944	954
NOX	NA	396	379	386	385	373	381	294	279	287	322	310	317

B. AMBIENT AIR QUALITY

	INTERNAL MONITORING				THIRD PARTY MONITORING		
PARAMETER	NORM	MAX.	MIN.	AVE.	MAX.	MIN.	AVE.
PM_{10} (µg/m^3)	100	94	14	60	76.3	27.9	47.8
$PM_{2.5}$ (µg/m^3)	60	55	8	32	46.6	18.4	29.4
SO_2 (µg/m^3)	80	18	7	11	15.6	11.8	13.2
NO_2 (µg/m^3)	80	26	12	18	14.5	11.2	12.6

C. AMBIENT NOISE LEVEL

	INTERNAL MONITORING				THIRD PARTY MONITORING			
	INDUSTRIAL NOISE LEVEL,dB(A)		RESIDENTIAL NOISE LEVEL,dB(A)		INDUSTRIAL NOISE LEVEL,dB(A)		RESIDENTIAL NOISE LEVEL,dB(A)	
	Day time	Night time	Day time	Night time	Day time	Night time	Day time	Night time
NORM	75	70	55	45	75	70	55	45
Minimum	66	64	38	36	62	51	50	40
Maximum	73	69	51	44	65	53	53	42
Average	69	66	44	39	64	52	52	41

D. LIQUID INDUSTRIAL EFFLUENT QUALITY

			INTERNAL MONITORING					THIRD PARTY MONITORING			
PARAMETERS	UNIT	NORM	RESULT		PARAMETERS	UNIT	NORM	RESULT	
			MAX.	MIN.				MAX.	MIN.
Temp(In)			-	-	pH	-	6.0 - 9.0		-
Temp(Out)	^{0}C	T(O) - T(I) = <5^{0}C	-	-	TSS	PPM	100	-	-
pH at 25^{0}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	-	-					
Res chlorine	PPM	1.0 max	-	-	Copper (as Cu)	PPM	3	-	-
BOD	PPM	30 max	-	-					
COD	PPM	250 max	-	-	Zinc(as Zn)	PPM	5	-	-

E. STP OUTLET

THIRD PARTY MONITORING

PARAMETERS	UNIT	NORM	RESULT	
			MAX.	MIN.
pH	-	6.5 - 9	7.29	7.14
TSS	PPM	20	10.2	8.9
BOD	PPM	10	10.8	10
COD	PPM	50	48.8	43.8
Total Nitrogen	PPM	10	11.9	9.8
Ammonical Nitrogen	PPM	5	10.4	8.9
Feacal Coliform	MPN/100ml	<100	23	15
Total Coliform	MPN/100ml	$	130	110

ODISHA POWER GENERATION CORPORATION LTD.
(A Government Company of the State of Odisha)
CIN: U401040R1984SG001429

Ib Thermal Power Station
Banharpali, Dist.: Jharsuguda, Odisha - 768 234, India
Plant Manager : (+916645) 289266, Fax: (+916645) 222-230
Factory Manager : (+916645) 222224, Fax: (+916645) 222-230

OPGC
Power For Progress

Letter No. ITPS/5390/WE
September 28, 2023

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

Sub: **Environmental Statement for ITPS (2x210MW & 2X660 MW) for the period from April 2022 to March 2023.**

Sir,

Enclosed please find herewith the annual Environmental Statement in (Form-V) for Ib Thermal Power Station (2x210MW & 2x660 MW), Banharpali, Jharsuguda for the period from 1st April 2022 to 31st March 2023 for kind perusal.

Thanking you

Sincerely yours,

Manas Ranjan Rout
Director (Operations) & Occupier

Encl: Environmental Statement

Copy to-Regional Officer, State Pollution Control Board, Plot No. 370/5971, At - Babubagicha (Cox Colony), St. Marry Hospital Road, Post – Industrial Estate, Jharsuguda for kind information.

ENVIRONMENTAL STATEMENT

Odisha Power Generation Corporation Ltd
Ib Thermal Power Station

Banharpali, Jharsuguda

(2 x 210 MW)

PERIOD FROM 1st APRIL 2022 TO 31st MARCH 2023

(FORM – V)

(See Rule 14)

Environmental Statement Report for the Financial Year ending the 31st March, 2023.

PART – A

i. Name and address of the Owner/**Occupier of the Industry** : **Mr. Manas Ranjan Rout**
Odisha Power Generation Corp. Ltd.
Ib Thermal Power Station
Banharpali, Jharsuguda
Pin Code- 768234
Site Office-Ph.06645-222220, Fax. 222230
Corp. Office- 06742303754, Fax. 2303755

ii. Production Capacity : 420 MW (2X210 MW)

iii. Year of Establishment : Unit#1-21.12.1994
: Unit#2-20.06.1996

iv. Date of last Environment Statement submitted : 27.09.2022

v. Industry category : Thermal Power Plant

OPGC
Power for Progress

PART – B

(Water and Raw Material Consumption)

(All values indicate Annual consumption) in m^3/day

Sl.	Description	2021-2022	2022-2023
(I)	Gross Energy Generation (MU/Year):	2951.802	2782.514
(ii)	Total Water consumption (m3/day):	23776	22353
(iii)	Ash disposal make up, Process NEBD:	3907	2763
(iv)	Cooling, Spraying, Boiler Feed:	19585	19168
(v)	Domestic*: (Excluding Township)	234	371
(vi)	Process, EBD	50	50

Sl No	Name of the product	Process Water Consumption per Unit of Product Output	
		2021-22	2022-23
01	Electricity	2.93 Kl/MWH	2.93 Kl/MWH

NB: The Sp. Water consumption was higher than previous due to lesser generation.

Name of Raw Material	Name of the product	Consumption of Raw Material unit of output			
		2021-22		2022-23	
Coal	Electricity	Total Consumption	2595424 MT	Total Consumption	2469575MT
		Specific Consumption	0.879 Kg/KWH	Specific Consumption	0.888Kg/KWH
Start-up Fuel Oil (LDO)	Electricity	Total Consumption	1186.913 KL	Total Consumption	1069.597 KL
		Specific Consumption	0.402 ml/KWH	Specific Consumption	0.384 ml/KWH

PART – C
Pollution discharged to Environment and Pollution Level

PERIOD- April 2021 TO March 2022								
STACK EMISSION								
PARAMETER	NORM	STACK 1			NORM	STACK 2		
		MAX.	MIN.	AVE.		MAX.	MIN.	AVE.
PM (mg/Nm^3)	100	93	76	85	100	92	78	86
CO_2 (%)	NA	17.8	6.9	9	NA	8.3	7.2	7.7
CO (mg/Nm^3)	NA	11.5	9.2	10.8	NA	12.1	9.3	9.9
SO_2 (mg/Nm^3)	600	1347	1006	1190	600	1386	948	1207
NO_x (mg/Nm^3)	600	225	130	170	600	210	121	173

AMBIENT AIR QUALITY								
PARAMETER	NORM	INDUSTRIAL			NORM	RESIDENTIAL		
		MAX.	MIN.	AVE.		MAX.	MIN.	AVE.
PM_{10} ug/m3	100	95	19	73	100	90	16	66
PM 2.5 ug/m3	60	58	10	40	60	54	09	37
SO_2 (ug/m3)	80	19	11	14	80	15	8	10
NO_x (ug/m3)	80	31	14	24	80	26	11	21

STP WATER QUALITY				
PARAMETER	NORM	MAX	MIN	AVE.
pH	6.5 – 9.0	7.26	6.50	6.96
TSS, mg/ltr	100	11	08	10
BOD(3 days at 27^0C), mg/ltr	30	14	8.3	10
COD, mg/ltr	250	72	32	54
Total Nitrogen(as N)	10	23.6	5.1	15
Ammonical Nitrogen(as NH_3-N)	50	19	3	11
Total coliform	--	261	132	176
Fecal coliform	<1000	94	15	43

AMBIENT NOISE in dB(A)			
INDUSTRIAL		RESIDENTIAL	
MAX.	MIN.	MAX.	MIN.
DAY TIME			
NORM			
75		55	
73	66	49	39
NIGHT TIME			
NORM			
70		45	
65	63	42	36

OPGC has installed continuous emission monitoring system for both the stacks, four continuous ambient air quality monitoring stations and one continuous effluent monitoring station for round the clock monitoring and control of emission/pollution

parameters. These stations are connected to SPCB & CPCB servers through real time data acquisition and transmission facility. The plant has achieved zero effluent discharge from December'18 onwards and till December'18 only 1 % effluent had been discharged after meeting the norms.

PART – D
HAZARDOUS WASTES

(As specified under Hazardous wastes/management & Handling Rules, 2008)

A. From Process:

Hazardous Waste Types	2021-22				2022-23			
	Opening stock	Generation	Sold/ Disposed	Balance	Opening stock	Generation	Sold/ Disposed	Balance
Used oil or Spent oil a.Used Lub. Oil : KL b.Used Grease: MT c.Used Transformer Oil :KL	**130.297 KL** a. 17.922 KL b. 112 MT c. 0.375 KL	**25.568 KL** a. 20.258 KL b. 5.31 MT c. Nil	**14.7**	**141.165 KL**	141.165 KL a. 23.48 KL b. 117.31 MT c. 0.375 KL	72.06 KL a. 55.05 KL b. 17.01 MT c. Nil	93.16	120.065KL
Waste or Residue containing oil*	1.1MT	0.5 MT (oily cotton waste)	Nil	1.6 MT	1.6MT	0.5MT	-	2.1MT
Oily sludge during cleaning: KL	0	0	0	Nil	0	0	0	Nil
Spent Resin, MT	7.6 MT	0	0	7.6 MT	7.6 MT	0	0	7.6 MT
Discarded Container a.oil drums (Nos) Empty Chemical Jar, Nosb b. CW chemical	702	125	300	527	527	361	466	422
Used batteries(Nos.)	292 Nos	255 Nos	221 Nos	34	34	168	152	50

B. From Pollution Control Facilities: No generation

PART – E
SOLID WASTES

A. Ash:

Solid Wastes (Ash):	Total Quantity (MT)	
	2021-22	2022-23
From Process	232973 MT (Bottom Ash)	230071 MT (Bottom Ash)
From Pollution Control Facilities	931891 MT (Fly Ash)	920282 MT (Fly Ash)
Quantity Utilized	403200 MT	464849 MT

Disposed in Ash Pond	761664 MT	685504 MT

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. Major road construction activities are taking place near Jharsuguda (Expansion of Sambalpur Rourkela Sate Highway No-10 & Expansion of Sambalpur National Highway No-42). The ash demands for these activities are me by other thermal power plants, close to the road construction areas. However, we have supplied around 8830 MT of ash in the last financial year for construction of road.

5. 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 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. 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 voi near to OPGC site but there has been no progress.

ii. State Pollution Control Board, Odisha made a proceeding on 05.06.10 for backfilling of OPGC ash in BOCM Mine void of MCL as an alternative solution against allotment of Lilari Mine void but no initiative has been taken so far from MCL side.

iii. 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.

iv. 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.

v. In response to the letter of Director (Operation), OPGC, dtd.24.08.2013 on the subject, Director (Tech. P&P), MCL negated 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.

vi. 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.

vii. In a letter dated 10.08.2020 OPGC had again requested Director Technical for allotment of BOCM mine void, however the request was turned down stating various technical causes.

viii. In a letter dated 14.06.2021 OPGC had again requested Director Technical for allotment of BOCM mine void, however the request was turned down vide MCL letter No253H, dated 07.08.2021 stating the reason of excavation of bottom seam and integration of Lakhanpur, Belpahar & Lilari mines.

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.

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 10 (ten) ash brick plants, which are located in and around the site of OPGCL's Project.
3. In order to further incentivize 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. Another avenue for Fly-Ash utilization which OPGC has explored is use in major road construction activities undertaken close to Jharsuguda or beyond Jharsuguda. The Fly-Ash demands for these activities are met by other TPPs, which are closer to the road construction areas. However, OPGCL still managed to supply 8830 MT of ash for road construction in the FY 2018-19.
5. 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.
6. Transportation subsidy of Rs 150/- per MT has been extended by OPGCL for enhancing ash utilization in areas of manufacturing of ash brick, other Fly-Ash-based products, cement/asbestos manufacturing & road construction.
7. OPGCL has been conducting various ash utilization awareness campaigns in the nearby community by way of street plays, distribution of pamphlets, etc.
8. 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, 1.4 acres & 1.12 acres for which consent has been taken from State Pollution Control Board, Odisha.
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. 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.

PART – F

Indicate disposal practice adopted for Hazardous as well as solid waste

A. Hazardous Wastes:

OPGC has obtained Hazardous Waste Authorization from OSPCB for Collection & Storage of Hazardous waste valid up to 31st March 2024.

Used Oil and grease are periodically collected from different location within plant & stored at designated place with concrete flooring, shed and secondary containment. The same is then transferred to a central storage area. This is being disposed to recyclers/re-processors having authorization & valid consent from SPCB & registered under CPCB.

Spent resin is temporarily stored in identified impervious pits at ITPS. It has been planned to dispose of the same in CHWTSDF. Asbestos generated from conveyer roofs as a phase out plan is disposed in underground pits within the plant premises. Discarded chemical containers are mostly returned to the Chemical suppliers against supply of fresh chemical supply.

E- Wastes are stored in designated places under concrete floor & shed. Inventorization of the same has been made & intimated to OSPCB. OPGC has signed lifetime membership agreement with M/S Ramky Enviro Engineers (RE Sustainability Ltd) for disposal of non-soluble, non-incinerable and non-recyclable hazardous wastes at Common Hazardous Wastes Treatment Storage and Disposal Facility (CHWTSDF), Jajpur.

New Batteries are procured from Battery suppliers against buy back of used/waste batteries.

B. Fly Ash and Bottom Ash

OPGC has both wet ash disposal system as well as dry ash disposal system at ITPS for handling the main solid waste i.e. fly ash & bottom ash. OPGC has 03 Ash Ponds i.e.

i. Ash Pond A- 150 Acres
ii. Ash Pond B- 242 Acres
iii. Ash Pond C- 115 Acres.

Ash pond B was exhausted in August 2007 and thereafter a study was conducted through IIT, Madras where it was recommended to go for another 03-meter Dry Ash Mounds on the Pond B. Based on which OPGC has constructed Ash Mounds on the Pond successfully.

Ash pond A is in partial operation and ash is evacuated from ash Pond A for utilization in low lying areas reclamation and road construction.

Ash Pond-C is operational, and ash is disposed in form of lean slurry.

Dry ash collection facility with 500 MT capacities Storage Silo for utilization of dry fly ash by Cement Industries & ash brick/block manufacturing units is already in place. The ash collected in this Silo is from Field 2 of ESPs suitable for Cement & Brick production. Provision has been made for additional storage and collection facility (60 T/Hr with Storage facility of 120 MT) from 1st fields of ESPs. This dry ash collection facility is made for adequate dry ash availability in utilizing ash in low land reclamation and road construction.

C. Other Solid Waste of Plant and Colony (Bio-degradable)

Solid Waste of plant other than Fly Ash & Bottom Ash, like ferrous & non-ferrous scraps are collected regularly from different sites & deposited in the designated scrap yard for selling.

Kitchen waste is collected from Plant Canteen, Colony, Guest House, ITPS Market etc. and segregated as biodegradable and non-biodegradable is being disposed in an eco-friendly manner in a 1.0 Ton Capacity Bio-Gas Plant with zero effluent discharge.

Other biodegradable waste of plant & colony is regularly collected from different places & disposed on OPGC land. Domestic effluent from Plant is disposed through Septic Tanks and Soak Pits and Sewage from colony is treated in 1.0 MLD capacity Sewage Treatment Plant (STP) with zero effluent discharge. Treated Sewage is reused for watering green belt and also used in Park for horticulture purpose.

D. Bio-medical Waste

OPGC has 18-bedded Hospital at ITPS without any Operation Theatre. Bio-medical waste is mainly non-toxic in nature and the quantity is insignificant. Wastes are treated and disposed following the prescribed method as stipulated in Bio medical waste authorization issued by OSPCB vide letter No 3994 Dated 31.03.2018 & valid till 31.03.2021. OPGC has also obtained Consent to Operate under Water Act from OSPCB vide letter no 15440/IND-I-CON-6658 dated 27.12.2018 and valid till 31.03.2021

E. Plastic waste

Plastic waste is being segregated from Colony Garbage and packed in gunny bags. The gunny bags containing plastics are being stored in a designated place at township. The same is being given to plastic waste recycler. Process has been initiated to dispose the same through co-processing in cement plant of M/s ACC Limited. Formal agreement is already in place for disposal.

OPGC has declared no usage of plastic carry bags in colony and plant area. Regular campaigns are made to restrict the use of plastic carry bags in township and peripheral areas. OPGC has distributed Jute carry bags to all its employees to promote non usage of plastic carry bags.

PART – G

A. Impact of the pollution control measures taken on conservation of natural resources and consequently on the cost of production.

- By adopting appropriate technology, operation & maintenance, monitoring practices and pollution control measures, OPGC has been successful in conserving coal, oil, water & energy through reduce /reuse/recycle.

- Through 100% Ash Water re-cycling system and maximum reuse of other liquid effluents is in process, not only control & prevention of water pollution takes place but also optimization of fresh water makeup has been taking place. Specific water consumption remains less than 3KL/MWH which indicates effective water conservation.
- Fuel oil consumption is monitored and controlled with minimum Unit light up periods and reducing number of Unit trips.
- Lubricant consumption is also monitored regularly to reduce its consumption.
- All bricks used for civil maintenance activities inside the plant are of ash bricks.
- Pond ash is being used for ash mound preparation & also for ash dyke height raising, thereby conserving soil for dyke height raising as well as increasing ash pond life.
- LED light and solar panel have led significant conservation of energy in township, as pond and street lighting

B. IMPACT OF POLLUTION CONTROL MEASURES ON COST OF PRODUCTION:

Cost of production reduces due to

1. Process optimization to operate plant with reduced emission and higher efficiency.
2. Conservation of resources used as input (Coal, Oil, Water.)
3. Waste utilization & eco-friendly and cost-effective disposal means (Solid waste and hazardous waste).

The additional investment and the above benefits balance some way by treating the pollution control and mitigation is integrated with overall efficiency of the plant and cost of the production

PART – H

Additional investment proposal for Environmental protection abatement of pollution,

Prevention of pollution

1. Utilization of ash in low lying areas, brick plants/asbestos- 1750 lakh
2. Tree Plantation/Green belt development- 2 lakh
3. Effective Ash dispersion control in Ash Pond at the time of turbulent wind flow- 30 lakh
4. Ash Disposal line replacement to reduce the risk of pipe line failure- 25 lakh
5. Hazardous waste disposal-5 Lakhs
6. Maintenance of online analysers-10 Lakhs
7. ISO 14001:2015 recertification-2.5 Lakhs

PART- I

Any other particulars for improving the quality of Environment.

- Complying with the directions and conditions of state and central pollution boards.
- Environment Management by establishing ISO 14001:2015 EMS and Global EMS standard.
- Fine tuning of ESPs of both the Units for achieving desired emission level.
- Adequate plantation and greenbelt developed to minimise air as well as noise pollution. Planted approx. 3.23 lakh trees. 34.73% greenbelt and plantation exits in and around plant and colony premises.
- Water conservation by 100% Ash water recirculation and other effluents recycle & reuse. All the plant effluent is also getting recycled back in process.
- Housekeeping has been given highest priority. Plant & Colony premises are maintained clean all the time. Roads are black turfed to control fugitive emission. Colour coded bins have been provided at all generation points for proper segregation and management of wastes.
- Water, Coal, Oil & Ash leakages & spillages are being controlled at the source itself to maintain clean work place and clean environment.
- Provided HDPE Lining on New Ash Pond (Ash Pond C) to minimize water pollution. Ash dykes are extra strengthened to prevent dyke failure.
- Implemented sound wastes management practices.
- Carrying out regular environmental audits by competent auditors and taking timely corrective measures.
- Carrying out Annual Hydrogeological study for studying characteristics of aquifers and quality of ground water.

Manas Ranjan Rout
Director (Operations) & Occupier

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ENVIRONMENTAL STATEMENT

Odisha Power Generation Corporation Ltd
Ib Thermal Power Station

Banharpali, Jharsuguda

(2 x 660 MW)

PERIOD FROM 1st APRIL 2022 TO 31st MARCH 2023

(FORM – V)

(See Rule 14)

Environmental Statement Report for the Financial Year ending the 31st March, 2023.

PART – A

i. Name and address of the Owner/Occupier of the Industry : **Mr. Manas Ranjan Rout**
Odisha Power Generation Corp. Ltd.
Ib Thermal Power Station
Banharpali, Jharsuguda
Pin Code- 768234
Site Office-Ph.06645-222220, Fax. 222230
Corp. Office- 06742303754, Fax. 2303755

ii. Production Capacity : 1320 MW (2X660 MW)

iii. Year of Establishment : Unit#3-03.07.2019
Unit#4-21.08.2019

iv. Date of last Environment Statement submitted : 27.09.2022

v. Industry category : Thermal Power Plant

PART – B

(Water and Raw Material Consumption)

(All values indicate Annual consumption) in m^3/day

Sl.	Description	2021-2022	2022-2023
(I)	Gross Energy Generation (MU):	7236.554	8930.912
(ii)	Total Water consumption/day:	54589	59161
(iii)	Ash disposal make up, Process NEBD:	No fresh water used for handling ash	No fresh water used for handling ash
(iv)	Cooling, Spraying, Boiler Feed:	48584	52052
(v)	Domestic*: (Excluding Township)	Reported under OPGC-1 (2x210 MW)	Reported under OPGC-1 (2x210 MW)
(vi)	Process, EBD	6004	7099

Sl No	Name of the product	Process Water Consumption per Unit of Product Output	
		2021-22	2022-23
01	Electricity	2.75 KL/MWH	2.42 KL/MWH

Name of Raw Material	Name of the product	Consumption of Raw Material unit of output			
		2021-22		2022-23	
Coal	Electricity	Total Consumption	5417921 MT	Total Consumption	6264081 MT
		Specific Consumption	0.748 Kg/KWH	Specific Consumption	0.701 Kg/KWH
Start-up Fuel Oil (LDO)	Electricity	Total Consumption	2159.79 KL	Total Consumption	1334.538 KL
		Specific Consumption	0.298 ml/KWH	Specific Consumption	0.149 ml/KWH

PART – C
Pollution discharged to Environment and Pollution Level

PERIOD- April 2021 TO March 2022

STACK EMISSION

PARAMETER	NORM	STACK #3			NORM	STACK #4		
		MAX.	MIN.	AVE.		MAX.	MIN.	AVE.
PM (mg/Nm^3)	**50**	41	31	37	**50**	39	22	35
SO_2 (mg/Nm^3)	**200**	1284	1017	1213	**200**	1286	1035	1205
NO_X (mg/Nm^3)	**450**	406	381	393	**450**	407	370	387

AMBIENT AIR QUALITY

PARAMETER	NORM	INDUSTRIAL			NORM	RESIDENTIAL		
		MAX.	MIN.	AVE.		MAX.	MIN.	AVE.
PM_{10} ug/m3	**100**	95	19	73	**100**	90	16	66
PM 2.5 ug/m3	**60**	58	10	40	**60**	54	09	37
SO_2 (ug/m3)	**80**	19	11	14	**80**	15	8	10
NO_x (ug/m3)	**80**	31	14	24	**80**	26	11	21

STP WATER QUALITY

PARAMETER	NORM	MAX	MIN	AVE.
pH	**6.5 – 9.0**	7.26	6.50	6.96
TSS, mg/ltr	**100**	11	08	10
BOD(3 days at 27^0C), mg/ltr	**30**	14	8.3	10
COD, mg/ltr	**250**	72	32	54
Total Nitrogen(as N)	**10**	23.6	5.1	15
Ammonical Nitrogen(as NH_3-N)	**50**	19	3	11
Total coliform	--	261	132	176
Fecal coliform	**<1000**	94	15	43

AMBIENT NOISE in dB(A)

INDUSTRIAL		RESIDENTIAL	
MAX.	MIN.	MAX.	MIN.
DAY TIME			
NORM			
75		**55**	
73	66	49	39
NIGHT TIME			
NORM			
70		**45**	
72	64	42	36

OPGC has installed continuous emission monitoring system for both the stacks, four continuous ambient air quality monitoring stations and one continuous effluent monitoring station for round the clock monitoring and control of emission/pollution parameters. These stations are connected to SPCB & CPCB servers through real time data acquisition and transmission facility. The plant has achieved zero effluent discharge from December'18 onwards and till December'18 only 1 % effluent had been discharged after meeting the norms.

PART – D
HAZARDOUS WASTES

(As specified under Hazardous wastes/management & Handling Rules, 2008)

A. From Process:

Hazardous Waste Types	2021-22				2022-23			
	Opening stock	Generation	Sold/ Disposed	Balance	Opening stock	Generation	Sold/ Disposed	Balance
Used oil/Spent oil a. Used Lub. Oil : KL b. Used Grease: MT c. Used Transformer Oil:KL	**31.625 KL**	**20.400 KL** a. 20 KL b. 0.400 KL c. Nil	Nil	**52.025 KL**	**52.025 KL**	**24.2KL** a. 24.2KL b. Nil c. Nil	Nil	**76.225KL**
Sludge contaminated with oil: KL	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Spent ion exchange resin, MT	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**
Waste Residue Containing Oil	2.5 MT	1.5 MT (oily cotton waste)	Nil	4 MT	4 MT	1.5MT	Nil	5.5MT
Used batteries(Nos.)	266 Nos	13 Nos	24 Nos	34 Nos	34 Nos	168 Nos	152 Nos	50 Nos

B. From Pollution Control Facilities: No generation

PART – E

SOLID WASTES

A. Ash:

Solid Wastes (Ash):	Total Quantity (MT)	
	2021-22	2022-23
From Process	**484130 MT (Bottom Ash)**	**564743 MT (Bottom Ash)**
From Pollution Control Facilities	**1936520 MT (Fly Ash)**	**2258981 MT (Fly Ash)**
Quantity Utilized	**578046 MT**	**657506 MT**
Disposed in Ash Pond	**1842604 MT**	**2166218 MT**

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. Major road construction activities are taking place near Jharsuguda (Expansion of Sambalpur Rourkela Sate Highway No-10 & Expansion of Sambalpur National Highway No-42). The ash demands for these activities are met by other thermal power plants, close to the road construction areas. However, we have supplied around 8830 MT of ash in the last financial year for construction of road.

5. 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 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. 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 05.06.10 for backfilling of OPGC ash in BOCM Mine void of MCL as an alternative solution against allotment of Lilari Mine void but no initiative has been taken so far from MCL side.

iii. 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.

iv. 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.

v. In response to the letter of Director (Operation), OPGC, dtd.24.08.2013 on the subject, Director (Tech. P&P), MCL negated 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.

vi. 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.

vii. In a letter dated 10.08.2020 OPGC had again requested Director Technical for allotment of BOCM mine void, however the request was turned down stating various technical causes.

viii. In a letter dated 14.06.2021 OPGC had again requested Director Technical for allotment of BOCM mine void, however the request was turned down vide MCL letter No253H, dated 07.08.2021 stating the reason of excavation of bottom seam and integration of Lakhanpur, Belpahar & Lilari mines.

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.

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 10 (ten) 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. Another avenue for Fly-Ash utilization which OPGC has explored is use in major road construction activities undertaken close to Jharsuguda or beyond Jharsuguda. The Fly-Ash demands for these activities are met by other TPPs, which are closer to the road construction areas. However, OPGCL still managed to supply 8830 MT of ash for road construction in the FY 2018-19.
5. 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.
6. Transportation subsidy of Rs 150/- per MT has been extended by OPGCL for enhancing ash utilization in areas of manufacturing of ash brick, other Fly-Ash-based products, cement/asbestos manufacturing & road construction.
7. OPGCL has been conducting various ash utilization awareness campaigns in the nearby community by way of street plays, distribution of pamphlets, etc.
8. 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, 1.4 acres & 1.12 acres for which consent has been taken from State Pollution Control Board, Odisha.
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. 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.

PART – F

Indicate disposal practice adopted for Hazardous as well as solid waste

A. Hazardous Wastes:

OPGC has obtained Hazardous Waste Authorization from OSPCB for Collection & Storage of Hazardous waste valid up to 31st March 2024.

Used Oil and grease are periodically collected from different location within plant & stored at designated place with concrete flooring, shed and secondary containment. The same is then transferred to a central storage area. This is being disposed to recyclers/re-processors having authorization & valid consent from SPCB & registered under CPCB.

Spent resin is temporarily stored in identified impervious pits at ITPS. It has been planned to dispose of the same in CHWTSDF. Asbestos generated from conveyer roofs as a phase out plan is disposed in underground pits within the plant premises. Discarded chemical containers are mostly returned to the Chemical suppliers against supply of fresh chemical supply.

E- Wastes are stored in designated places under concrete floor & shed. Inventorization of the same has been made & intimated to OSPCB. OPGC has signed lifetime membership agreement with M/S Ramky Enviro Engineers (RE Sustainability Ltd) for disposal of non-soluble, non-incinerable and non-recyclable hazardous wastes at Common Hazardous Wastes Treatment Storage and Disposal Facility (CHWTSDF), Jajpur.

New Batteries are procured from Battery suppliers against buy back of used/waste batteries.

B. Fly Ash and Bottom Ash

OPGC has both wet ash disposal system as well as dry ash disposal system at ITPS for handling the main solid waste i.e. fly ash & bottom ash. OPGC has 03 Ash Ponds i.e.

i. Ash Pond A- 150 Acres
ii. Ash Pond B- 242 Acres
iii. Ash Pond C- 115 Acres.

Ash pond B was exhausted in August 2007 and thereafter a study was conducted through IIT, Madras where it was recommended to go for another 03-meter Dry Ash Mounds on the Pond B. Based on which OPGC has constructed Ash Mounds on the Pond successfully.

Ash pond A is in partial operation and ash is evacuated from ash Pond A for utilization in low lying areas

reclamation and road construction.

Ash Pond-C is operational, and ash is disposed in form of lean slurry.

Dry ash collection facility with 500 MT capacities Storage Silo for utilization of dry fly ash by Cement Industries & ash brick/block manufacturing units is already in place. The ash collected in this Silo is from Field 2 of ESPs suitable for Cement & Brick production. Provision has been made for additional storage and collection facility (60 T/Hr with Storage facility of 120 MT) from 1st fields of ESPs. This dry ash collection facility is made for adequate dry ash availability in utilizing ash in low land reclamation and road construction.

C. Other Solid Waste of Plant and Colony (Bio-degradable)

Solid Waste of plant other than Fly Ash & Bottom Ash, like ferrous & non-ferrous scraps are collected regularly from different sites & deposited in the designated scrap yard for selling.

Kitchen waste is collected from Plant Canteen, Colony, Guest House, ITPS Market etc. and segregated as biodegradable and non-biodegradable is being disposed in an eco-friendly manner in a 1.0 Ton Capacity Bio-Gas Plant with zero effluent discharge.

Other biodegradable waste of plant & colony is regularly collected from different places & disposed on OPGC land. Domestic effluent from Plant is disposed through Septic Tanks and Soak Pits and Sewage from colony is treated in 1.0 MLD capacity Sewage Treatment Plant (STP) with zero effluent discharge. Treated Sewage is reused for watering green belt and also used in Park for horticulture purpose.

D. Bio-medical Waste

OPGC has 18-bedded Hospital at ITPS without any Operation Theatre. Bio-medical waste is mainly non-toxic in nature and the quantity is insignificant. Wastes are treated and disposed following the prescribed method as stipulated in Bio medical waste authorization issued by OSPCB vide letter No 3994 Dated 31.03.2018 & valid till 31.03.2021. OPGC has also obtained Consent to Operate under Water Act from OSPCB vide letter no 15440/IND-I-CON-6658 dated 27.12.2018 and valid till 31.03.2021

E. Plastic waste

Plastic waste is being segregated from Colony Garbage and packed in gunny bags. The gunny bags containing plastics are being stored in a designated place at township. The same is being given to plastic waste recycler. Process has been initiated to dispose the same through co-processing in cement plant of M/s ACC Limited. Formal agreement is already in place for disposal.

OPGC has declared no usage of plastic carry bags in colony and plant area. Regular campaigns are made to restrict the use of plastic carry bags in township and peripheral areas. OPGC has distributed Jute carry bags to all its employees to promote non usage of plastic carry bags.

PART – G

A. Impact of the pollution control measures taken on conservation of natural resources and consequently on the cost of production.

- By adopting appropriate technology, operation & maintenance, monitoring practices and pollution control measures, OPGC has been successful in conserving coal, oil, water & energy through reduce /reuse/recycle.
- Through 100% Ash Water re-cycling system and maximum reuse of other liquid effluents is in process, not only control & prevention of water pollution takes place but also optimization of fresh water makeup has been taking place. Specific water consumption remains less than 3KL/MWH which indicates effective water conservation.
- Fuel oil consumption is monitored and controlled with minimum Unit light up periods and reducing number of Unit trips.
- Lubricant consumption is also monitored regularly to reduce its consumption.
- All bricks used for civil maintenance activities inside the plant are of ash bricks.
- Pond ash is being used for ash mound preparation & also for ash dyke height raising, thereby conserving soil for dyke height raising as well as increasing ash pond life.
- LED light and solar panel have led significant conservation of energy in township, as pond and street lighting

B. IMPACT OF POLLUTION CONTROL MEASURES ON COST OF PRODUCTION:

Cost of production reduces due to

1. Process optimization to operate plant with reduced emission and higher efficiency.
2. Conservation of resources used as input (Coal, Oil, Water.)
3. Waste utilization & eco-friendly and cost-effective disposal means (Solid waste and hazardous waste).

The additional investment and the above benefits balance some way by treating the pollution control and mitigation is integrated with overall efficiency of the plant and cost of the production

PART – H

Additional investment proposal for Environmental protection abatement of pollution,

Prevention of pollution

1. Utilization of ash in low lying areas, brick plants/asbestos- 1750 lakh
2. Tree Plantation/Green belt development- 2 lakh
3. Effective Ash dispersion control in Ash Pond at the time of turbulent wind flow- 30 lakh
4. Ash Disposal line replacement to reduce the risk of pipe line failure- 25 lakh
5. Hazardous waste disposal-5 Lakhs
6. Maintenance of online analysers-10 Lakhs
7. ISO 14001:2015 recertification-2.5 Lakhs

PART- I

Any other particulars for improving the quality of Environment.

- Complying with the directions and conditions of state and central pollution boards.
- Environment Management by establishing ISO 14001:2015 EMS and Global EMS standard.
- Fine tuning of ESPs of both the Units for achieving desired emission level.
- Adequate plantation and greenbelt developed to minimise air as well as noise pollution. Planted approx. 3.23 lakh trees. 34.73% greenbelt and plantation exits in and around plant and colony premises.
- Water conservation by 100% Ash water recirculation and other effluents recycle & reuse. All the plant effluent is also getting recycled back in process.
- Housekeeping has been given highest priority. Plant & Colony premises are maintained clean all the time. Roads are black turfed to control fugitive emission. Colour coded bins have been provided at all generation points for proper segregation and management of wastes.
- Water, Coal, Oil & Ash leakages & spillages are being controlled at the source itself to maintain clean work place and clean environment.
- Provided HDPE Lining on New Ash Pond (Ash Pond C) to minimize water pollution. Ash dykes are extra strengthened to prevent dyke failure.
- Implemented sound wastes management practices.
- Carrying out regular environmental audits by competent auditors and taking timely corrective measures.
- Carrying out Annual Hydrogeological study for studying characteristics of aquifers and quality of ground water.

Manas Ranjan Rout
Director (Operations) & Occupier

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Annexure - I

S.N	Project Theme	Project Description	Name of the Village	Name of Gram Panchayat	Oper. Area	Approved Budget by CSR Committee & BOD in Rs. Lakhs	Project Status As on 20-09-2018
1	Water & Sanitation	Drinking water project	Sarbahal	Sanghumda	MGR	16.00	Awarded & Ongoing
2		Water Sanitation & Hygiene (WASH) Project	08 villages of Telenpali G.P	Telenpali	Power Plant	359.00	Completed
3		Water Sanitation & Hygiene (WASH) Project	08 Villages of Kusuraloi G.P	Kusuraloi	MGR	416.00	Awarded & Ongoing
4		Water Sanitation & Hygiene (WASH) Project	22 Villages of Tilia G.P	Tilia	N. Ash Pond	600.00	Awarded & Ongoing
5		Water Sanitation & Hygiene (WASH) Project at Rengali Village in all 05 Hamlet & habitations	Rengali	Kumarbandh	Power Plant	125.00	Awarded & Ongoing
6		Installation of drinking water project	Beleituda	Rajpur	MGR	22.00	Awarded & Ongoing
7		Toilet for Girls in High School	Phatapali	Tilia	N. Ash Pond	5.00	Completed
8		Kumarbandh Education Complex (School & College) Drinking Water Project	Kumarbandh	Kumarbandh	Power Plant	5.00	Completed
9		Kumarbandh College Sanitation Project	Kumarbandh	Kumarbandh	Power Plant	10.00	Completed
10		Kumarbandh Police Station Sanitation Project	Kumarbandh	Kumarbandh	Power Plant	5.00	Completed
11		Construction of Toilet Facility at District Police Line	Jharsuguda	Jharsuguda	Power Plant	30.00	Completed
12		Drinking water Project at Bhaludole & Sargipali village	02 Villages	Kumarbandh	Power Plant	20.00	Estimate Stage
13	Education	Cycle stand for 100 Children in High School	Phatapali	Tilia	N. Ash Pond	5.00	Completed
14		Construction of High School Building	Remenda	Remenda	Power Plant	40.00	Completed
15		Construction of School Building & Anganwadi Centre	Telenpali	Telenpali	Power Plant	25.00	Completed
16		Construction of 02 Additional Class Rooms in High School	Banharpali	Telenpali	Power Plant	15.00	Completed

S.N	Project Theme	Project Description	Name of the Village	Name of Gram Panchayat	Oper. Area	Approved Budget by CSR Committee & BOD in Rs. Lakhs	Project Status As on 20-09-2018
17	Ed	Construction of Cycle Stand at U.P. School	Banharpali	Telenpali	Power Plant	5.00	Completed
18		Construction of two Classrooms at School	Bargad	Kusuraloi	MGR	15.00	Awarded & Ongoing
19		Basic materials to Primary School Hostel (PSH) at Kanaktura (Sundargarh District)	Kanaktura	Kanaktura	MGR	4.00	Completed
20		Leveling of Pathway at Kantatikira Project U.P School	Kantatikira	Kumarbandh	Power Plant	1.25	Awarded & Ongoing
21	Rural Development	Deepening of village pond at Saradhapali village	Saradhapali	Kumarbandh	Power Plant	2.75	Awarded & Ongoing
22		Construction of Kalyan Mandap	Kechubahal	Chandnimal	MGR	35.00	Awarded & Ongoing
23		Excavation of new Pond	Sarbahal	Sanghumda	MGR	10.00	Awarded & Ongoing
24		Deepening of village Pond	Kanaktura	Kanaktura	MGR	5.00	Completed
25		Construction of Bathing Ghat	Kechubahal	Chandnimal	MGR	3.00	Completed
26		Renovation of Pond (Gheemunda) Rohidas Para	Chandnimal	Chandnimal	MGR	5.00	Completed
27		Digging of village Pond	Gaudmal	Gaudmal	MGR	12.00	Completed
28		Renovation of Pond & Construction of Bathing Step (Bada Kanta)	Rajpur	Rajpur	MGR	10.00	Completed
29		Deepening of Village Pond	Ambdhar	Rajpur	MGR	10.00	Completed
30		Construction of New School Building	Sarbahal	Sanghumda	MGR	14.00	Awarded & Ongoing
31		Repair and Annual Maintainance Contract (AMC) of Street Light		Rajpur	MGR	15.00	Estimate Stage
32		Repairing of Road from Telenpali gate to Pump House Chawk	Telenpali	Telenpali	Power Plant	45.00	Cancelled
33		Construction of Road to village	Gaudmal	Gaudmal	MGR	12.00	Awarded & Ongoing
34		Construction of Community Centre	Chandnimal	Chandnimal	MGR	10.00	Awarded & Ongoing
35		Construction of Community Centre	Sarbahal	Sanghumda	MGR	10.00	Completed
36		Construction of community centre	Junanimunda	Rajpur	MGR	8.00	Awarded & Ongoing
37		Construction of community centre	Beleituda	Rajpur	MGR	8.00	Awarded & Ongoing
38		Ramela Pada Community Centre	Badsarua	Tilia	N. Ash Pond	8.00	Completed
39		Phatapali (Saharapada) Community Centre	Phatapali	Tilia	N. Ash Pond	8.00	Completed

S.N	Project Theme	Project Description	Name of the Village	Name of Gram Panchayat	Oper. Area	Approved Budget by CSR Committee & BOD in Rs. Lakhs	Project Status As on 20-09-2018
40		Community Centre (Near Bus Stand)	Tilia	Tilia	N. Ash Pond	8.00	Completed
41		Community Centre (near Tilia market)	Nuapada	Tilia	N. Ash Pond	8.00	Completed
42		Community Centre at Pudhipali	Tilia	Tilia	N. Ash Pond	8.00	Completed
43		Community Centre	Binika	Telenpali	Power Plant	8.00	Completed
44		Bhagabanpali Kanta (Birtia) Renovation	Bhagbanpali	Tilia	N. Ash Pond	4.00	Completed
45		Singhda bandh Pond Renovation	Singheipali	Tilia	N. Ash Pond	4.00	Completed
46		Shabandh (Kantatikra) Pond Renovation	Kantatikira	Tilia	N. Ash Pond	4.00	Completed
47		Thorapali Pond Renovation	Thorapali	Tilia	N. Ash Pond	4.00	Completed
48		Sivakanta Bathing Steps (two)	Badsarua	Tilia	N. Ash Pond	3.50	Completed
49		Nua Kanta Bathing Steps (two)	Pudhipali	Tilia	N. Ash Pond	3.50	Completed
50		Pipal Kanta Bathing Steps (two)	Kantatikira	Tilia	N. Ash Pond	3.50	Awarded & Ongoing
51		Tali Kanta Bathing Steps (two)	Phatapali	Tilia	N. Ash Pond	3.50	Completed
52		Renovationof pond at Charmal	Nuapada	Tilia	N. Ash Pond	7.00	Completed
53		Rengali Bandha 02 Bathing Steps	Rengali	Kumarbandh	Power Plant	3.50	Completed
54		Pond Renovation	Bhaludole	Kumarbandh	Power Plant	4.00	Awarded & Ongoing
55		Pond Renovation	Banikdera	Kumarbandh	Power Plant	4.00	Completed
56		Pond Renovation	Kantapali	Kumarbandh	Power Plant	4.00	Completed

S.N	Project Theme	Project Description	Name of the Village	Name of Gram Panchayat	Oper. Area	Approved Budget by CSR Committee & BOD in Rs. Lakhs	Project Status As on 20-09-2018
57		Dunguri Kisan Pada Pond Renovation & 02 Bathing Steps	Rengali	Kumarbandh	Power Plant	7.00	Completed
58		Sajni Kanta Pond Renovation	Budhapali	Kumarbandh	Power Plant	4.00	Completed
59		Birtia Kanta Renovation and 02 Bathing Steps	Barihapali	Sunari	Power Plant	7.00	Completed
60		Renovation of Rani Sagar Pond	Old Adhapada	Telenpali	Power Plant	4.00	Completed
61		Telenpali Upper Bandh 02 Bathing Ghats	Telenpali	Telenpali	Power Plant	3.50	Completed
62		Construction of Community Centre	Sargipali	Kumarbandh	Power Plant	15.00	Completed
63		Construction of Community Centre	Kantatikira	Kumarbandh	Power Plant	10.00	Completed
64		Electrification of Village(Part of WASH Project)	Sahareipada	Telenpali	Power Plant	7.00	Completed
65		Construction of Bus Stop	Kusuraloi	Kusuraloi	MGR	5.00	Completed
66		Construction of Kalyan Mandap at Suitable Place	Telenpali G.P	Telenpali	Power Plant	30.00	Awarded & Ongoing
67		Kalyan Mandap at Ambdhar	Ambdhar	Rajpur	MGR	35.00	Estimate Stage
68		LED Street Light on Main Road	Banharpali	Telenpali	Power Plant	5.00	Completed
69		LED Street Light on Main Road	05 G.P	05 G.P	Power Plant	150.00	Completed
70		Installation of High Mast light	Adhapada	Kusuraloi	MGR	9.00	Completed
71		2.1 K.M LED Street Light on Main Road	Belpahar Muncipality	Belpahar Muncipality	MGR	30.00	Completed
72		LED Street Light Project in Tilia Revenue Village (including all its hamlets/ constituent padas)	Tilia	Tilia	N. Ash Pond	50.00	Awarded & Ongoing
73		Erection/ Construction of New Electrical Infrastructure in Bargad Village near ITPS	Bargad	Kusuraloi	Power Plant	50.00	Estimate Stage
74		Bus Stop at Telenpali Market Bus Stand	Telenpali	Telenpali	Power Plant	5.00	Completed
75		Renovation of Asthai Kanta	Adhapada	Kusuraloi	MGR	10.00	Completed
76		Deepening of Village Pond & 02 Bathing Steps	Phalsamunda	Kusuraloi	MGR	7.00	Completed
77		Deepening of Naik Kanta	Khandsa	Kusuraloi	MGR	4.00	Completed
78		Renovation of Village Pond	Bargad	Kusuraloi	MGR	4.00	Completed

S.N	Project Theme	Project Description	Name of the Village	Name of Gram Panchayat	Oper. Area	Approved Budget by CSR Committee & BOD in Rs. Lakhs	Project Status As on 20-09-2018
79		Multi-purpose Training Hall Inside PHC Building along with Filtered Drinking Water Facility	Adhapada	Kusuraloi	MGR	15.00	Completed
80		06 (six) Bathing Ghats in four villages of Kushraloi	Kerualbahal etc	Kusuraloi	MGR	10.00	Completed
81		Community Centre	Adhapada	Kusuraloi	MGR	11.00	Completed
82		Repair/ Extension of Community Centre	Phalsamunda	Kusuraloi	MGR	5.00	Completed
83		Tali Kanta Irrigation Project	Telenpali	Telenpali	Power Plant	25.00	Completed
84		Construction of Canal from Asthai Kanta to Goucharmal at Adhapada	Adhapada	Kusuraloi	MGR	15.00	Completed
85		Big Community Centre/ Kalyan Mandap project in Tilia Revenue Village	Tilia	Tilia	N. Ash Pond	34.00	Awarded & Ongoing
86		Electrification of Dhobadera & Sapali Village	02 Villages	Telenpali	Power Plant	36.00	Completed
87	Physical Monitoring of projects, documentation, training and capacity building, overheads, etc.	Baseline survey in peripheral villages	37 villages	11 G.P's	Power Plant	20.00	Completed
88		Production of Video Films	37 villages	11 G.P's	Power Plant	10.83	Completed
89		Physical Monitoring of projects, documentation, training and capacity building, overheads, etc.	-	-	Power Plant	19.17	Awarded & Ongoing
Total CSR Budget (OPGC II- Unit 3&4) Approved by CSR Committee						**2691.00**	

OPGC

Renewable Energy Projects

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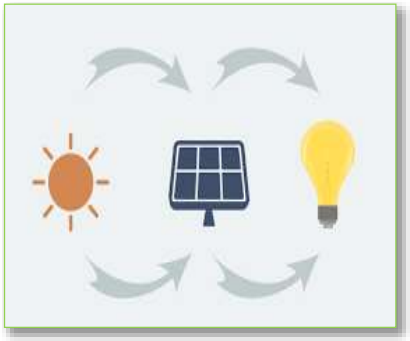
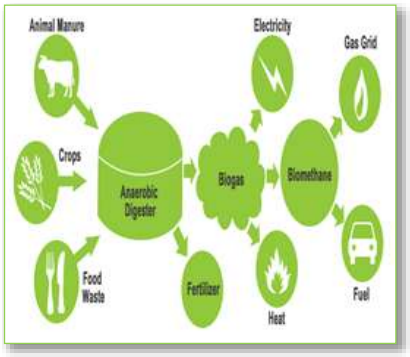
Engg & Efficiency Dept.





Renewable Initiatives:

- Solar Photovoltaic Roof top plants
- Solar Powered LED Street Lights.
- Solar Water Heaters.

1. Roof top PV Plants :

Sl.no	Area	Installed Capacity	Connected Load
1	Switch yard	**3 KW**	**2.2 KW**
2	Ash Pond	**6 KW**	**4.55 KW**
3	DM Plant	**9 KW**	**7.26 KW**
4	CW Pump House	**3 KW**	**2.1 KW**
5	Plant Canteen	**9 KW**	**6 KW** + (**2.0 KW** flexible load of heater/food warmer)
6	Service Building	**9 KW**	**9KW**
	Total	**39 KW**	

a. PV Solar System at Switch Yard Roof:

3 KW PV Solar system installed at 220kV switchyard control room building commissioned in **April-2016**.

- **Connected load**: All indoor lighting of Switch yard control room, Front & rear halogen lights of Switch yard control room building.

b. PV Solar System at Ash Pond Control Room Roof:

2x3 KW PV Solar system installed at Ash Pond Control Room roof top commissioned in **June-2017.**

- **Connected load**: All indoor lighting of Switch gear control room, Battery room, Front & rear halogen lights of Ash pond switch gear room, all outdoor lighting of Ash Pond 33/6.6KV Switch yard.

c. PV Solar System at DM Plant Building Roof:

3x3 KW PV Solar system installed at DM Plant building Roof commissioned in **June-2018**.

- **Connected load**: All indoor lighting of control room, MCC room, Office rooms, Efficiency Lab, GCV Room & coal laboratory.

d. PV Solar System at CW Pump House Roof:

3 KW PV Solar system installed at CW Pump house roof commissioned in **June-2018**.

- **Connected load**: All indoor lighting of MCC room & outside lights.

e. PV Solar System at Plant Canteen building Roof:

9 KW PV Solar system installed at Plant Canteen roof commissioned in **April-2019**.

Connected load: All indoor lighting of Canteen dining, fans, Water cooler, TV, Insect killers & Portable strip warmers.

e. PV Solar System at Service Building Roof:

9 KW PV Solar system installed at service building roof commissioned in **March-2021**.

- **Connected load**: All indoor lighting, fans, water cooler of Service building 3rd floor.

Solar PV Plant in Canteen.

Solar PV Plant in DM Plant.

Solar PV Plant in Ash Pond.

Solar PV Plant at Service Building

2. Solar Powered LED Street Lights:

Solar Powered LED Street Light at Ash pond-C

- Total **60 no's** of solar 50 watt powered 30 watt LED's Street lights are installed in Ash Pond –C area.
- The total capacity of the system is **3KW**.
- Specific Features of the street lights: Pole Mounted type, Inbuilt Maintenance free Lithium Ion Battery With Motion Sensor.
- Lights are in service on an average 11 hours daily i.e. 6 pm to 5am .
- **Electrical Energy saved in a month** =60 no's x 30 watt x 11 hours x 30 days = **594 kWh**.

3. Solar Water Heater:

a. Solar Water Heater:

Solar Water Heater at Plant

900 Litre /day Solar Water Heater installed at roof of plant canteen commissioned in **March-2017**

- 3 Hot water tap points are provided at different locations inside plant canteen: for full filling the hot requirements like cooking, utensil cleaning, tea making, and vegetable washing & cleaning.
- Physical verification on **6th April 2019**, all the three hot tap points are working & serving their purpose.
- The electric geyser is in OFF condition.
- Energy Savings for geyser not in service: 2 kw X 4hrs X 30 Days=**240 KWH**
  (Also LPG Cylinder consumption savings is additional**.)**

b. Solar Water Heater at Guest House & Quarters

2000 Litre/day Solar Water Heater has been installed at ITPS Guest House (OPGC township) commissioned in **Sept-16**.

Solar water heater in :

D1 Type - 14000 LPD(7 x2000 LPD)

D3 Type-6000 LPD(3X 2000 LPD)

Purpose: To serve the hot water requirement to the individual rooms/houses.

Biogas Plant

a. Biogas supplied to guest house:

- **1 MTD**- Per day capacity (which is running at 30% capacity providing 5to6 hrs gas supply to guesthouse.)

+

Solar water heater in :

D1 Type - 14000 LPD(7 x2000 LPD)

D3 Type-6000 LPD(3X 2000 LPD)

ANNEXURE - 5

Visiontek Consultancy Services Pvt. Ltd.

(Committed For Better Environment)

Certified for : ISO 9001:2015, ISO 14001:2015, ISO 45001:2018

Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

- ...cture Enginering
- ...Resource Management
- ...onmental & Social Study
- Surface & Sub-Surface Investigation
- Quality Control & Project Management
- Renewable Energy
- Agricultural Development
- Information Technology
- Public Health Engineering
- Mine Planning & Design
- Mineral/Sub-Soil Exploration
- Waste Management Services

Ref/Env. Lab/23-24/TR-08522 Date:30.09.2023

GROUND WATER ANALYSIS REPORT FOR THE MONTH OF SEPTEMBER-2023

1. Name of the Industry : ODISHA POWER GENERATION CORPORATION LIMITED,
   IB THERMAL POWER STATION, JHARSUGUDA
2. Name of the Location : GW1- Sardhapali Village Tube well
   : GW2- Sargipali Village Tube Well
3. Date of Sampling : 20-09-2023
4. Date of Analysis : 21-09-2023 to 27-09-2023
5. Sample Collected By : VCSPL Representative in presence of Client's Representative

Sl. No	Parameters	Test methods	Unit	Requirement Desirable limit (IS:10500:2015)	Results	
Organoleptic & Physical Parameters					GW-1	GW-2
1	Color	APHA2120 B,C	Hazen, max	5	<5.0	<5.0
2	Odor	APHA 2120 B	--	Agreeable	Agreeable	Agreeable
3	pH value	APHA4500 H^+B	--	6.5-8.5	7.26	6.87
4	Turbidity	APHA 2130 B	NTU m max	1.0	0.8	38.7
5	Total Dissolved Solids (as TDS)	APHA 2540 C	mg/l, max	500	147.9	351.25
6	Temperature	-	^{0}C	-	24.0	24.0
7	Conductivity	APHA 2510 C	µS/cm	-	227.5	540.4
General Parameters Concerning Substances Undesirable in Excessive Amounts						
8	Calcium (as Ca)	APHA3500Ca B	mg/l, max	75	24.8	33.7
9	Chloride (as Cl)	APHA4500Cl B	mg/l, max	250	16.0	13.2
10	Copper (as Cu)	APHA 3111B,C	mg/l, max	0.05	<0.05	<0.05
11	Fluoride (as F)	APHA 4500F C	mg/l, max	1.0	0.70	0.40
12	Free residual Chlorine	APHA4500Cl B	mg/l, min	0.2	0.20	ND
13	Iron (as Fe)	APHA3500Fe B	mg/l, max	1.0	<0.05	0.05
14	Magnesium (as Mg)	APHA3500Mg.B	mg/l, max	30	4.9	42.8
15	Manganese (as Mn)	APHA3500Mn B	mg/l, max	0.1	<0.05	<0.05
16	Mineral oil	APHA 5220 B	mg/l, max	0.5	<0.02	<0.02
17	Phenolic compounds (as C_6H_5OH)	APHA 5530 B,C	mg/l, max	0.001	<0.001	<0.001
18	Selenium (as Se)	APHA 3114B	mg/l, max	0.01	<0.001	<0.001
19	Sulphate (as SO_4)	APHA4500SO_4^{2-}B	mg/l, max	200	29.4	1.9
20	Total Alkalinity	APHA 2320 B	mg/l, max	200	59.5	304.6
21	Total Hardness	APHA 2340 C	mg/l, max	200	82.0	260
22	Zinc(as Zn)	APHA 3111B,C	mg/l, max	5.0	1.02	0.18

Parameters Concerning Toxic Substances							
23	Cadmium (as Cd)	APHA 3111B,C	mg/l, max	0.003	<0.003	<0.003	<0.003
24	Cyanide (as Cn)	APHA4500CN⁻C,D	mg/l, max	0.05	<0.01	<0.01	<0.01
25	Lead (as Pb)	APHA 3111B,C	mg/l, max	0.01	<0.01	<0.01	<0.01
26	Mercury (as Hg)	APHA 3500 Hg	mg/l, max	0.001	<0.001	<0.001	<0.001
27	Total arsenic	APHA 3114B	mg/l, max	0.01	<0.001	<0.001	<0.001
29	Total Coliforms	APHA 9221 B	MPN/100ml	Shall not be detected	<1.1	<1.1	<1.1

Reviewed by

Approved by