JINDAL POWER

JPL/EMD/F-30/4x250MW/2023/35
24/05/2023

The Regional Director (S),
Ministry of Environment and Forests,
Regional office (WCZ)
Ground Floor, East Wing
New Secretariat Building
Civil Line, Nagpur - 440001 (Maharashtra)

Sub.:-**Submission of Half Yearly Environmental Clearance Compliance Reports of Stage-I (2x250MW) and Stage-II (2x250MW) of O.P. Jindal Super Thermal Power Plant at village Tamnar, Distt.- Raigarh (C.G.) for the period of October, 2022 to March, 2023.**

Ref.:- **1. Environmental Clearance No.J.13011/15/93-IA.II (T) dt. 24/09/1997 & Revalidated on 19/08/2004 of Stage–I (2 x 250 MW), J-13011/8/2006-IA.II (T) dt.08/06/2006 of Stage –II (2 x 250 MW).**
2. Amendment in Environmental Clearance issued vide letter No. J.13011/8/2006-IA.II (T) dt.25/04/2007.
3. MoEF Office Memorandum No. J-11013/41/2006-IA.II (I) dt.06/04/2011.
4. Amendment In Environmental Clearance issued vide letter No. J.13012/8/2006-IA.II (T) dt.03/01/2019.
5. Amendment in Environmental Clearance issued vide letter No. J.13011/8/2006-IA.II (T) dt.13/08/2021.

Dear Sir,

This has reference to the above cited subject. Enclosed please find herewith Half Yearly Environmental Clearance Compliance Reports of Stage-I (2x250MW) and Stage-II (2x250MW) and compliance of additional conditions of O.P. Jindal Super Thermal Power Plant at village Tamnar, Distt.- Raigarh (C.G.) along with Environmental monitoring data for the period of ***October, 2022 to March,2023*** in soft copy (through e-mail).

Trust that you will find the above information in order.

Thanking you,

Yours faithfully,
For **JINDAL POWER LIMITED**

Shiv Kumar Singh
General Manager -EMD
Encl. : As above.
Cc:

Integrated Regional Office(IRO) Aranya Bhawan, North Block Sec.19 Naya Raipur, Atal Nagar (CG) -492002	The Zonal Officer, Central Pollution Control Board, 3rd Floor, Sahkar Bhawan, North T.T.Nagar, Bhopal-462 003 (M.P)
The Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhavan, North Block Sec.19 Atal Nagar, Raipur (CG) -490099	

Jindal Power Limited, Tamnar

Compliance Report of Environmental Clearance and additional conditions for Stage-I (2x250MW) of O.P. Jindal Super TPP, Tamnar vide letters No.J.13011/15/93-IA.II (T) & J.11013/41/2006-IA.II (I) dated 24/09/1997 & 06/04/2011

Sl. No	Conditions	Compliance Status
(i)	All the conditions stipulated by Madhya Pradesh Pollution Control Board vide their letter No. 2077/TS/EZ/MPPCB/96 dated 07/02/1997 should be strictly implemented.	All the conditions stipulated by the Madhya Pradesh Pollution Control Board vide their letter No. 2077/TS/EZ/MPPCB/96 dated 07/02/1996 are strictly implemented.
(ii)	**(As amended vide MoEF letter No. J-13011/15/2003-IA. II (T) dt. 24/06/05)** : A bi-flue stack of 220 m height and internal diameter of 4.75 m with continuous monitoring system shall be installed for 2 x 250 MW units as Phase-1. For adequate dispersal of gaseous pollutants, exit velocity will be maintained at 25 m/sec by installing ID fans and continuous record of exit velocity shall also be maintained and submitted to the Ministry on a yearly basis.	A bi-flue stack of height 220 m and internal diameter of 4.75 m with continuous on-line monitoring system has been already installed. Exit velocity of 25 m/s is maintained. Records of exit velocity has been maintained and report for the period from October, 2022 to March, 2023 is enclosed as ***Annexure-1a &1b.***
(iii)	Electrostatic Precipitator having efficiency of not less 99.8% should be installed. It should be ensured that particulate emission would not exceed the prescribed limit of 150 mg/Nm^3.	Electrostatic Precipitators (ESP's) of efficiency >99.9% have been installed. The ESP's are designed to achieve particulate emission below 50 mg/Nm^3. Particulate Matter monitoring report for the period from October, 2022 to March, 2023 is enclosed as ***Annexure-1a &1b.***
(iv)	Closed Circuit Cooling Device should be provided and it should be ensured that only minimum water is drawn for makeup purposes. The requirement of water for the project will be met by constructing 18 mt high dam across Kurkut River involving a cost around Rs.48 crores. The forest area coming under submergence shall be identified and separate clearance under the Forest (Conservation) Act shall be obtained by the project authorities prior to commissioning the work on the project.	Induced Draft Cooling Tower with closed circuit has been installed and a COC > 5 is maintained to ensure that minimum water is drawn for make-up purpose. An 18 m high dam across Kurket river has been constructed and is in operation. Around 177.542 Ha. forest area had been identified under submergence area and a separate clearance from Chhattisgarh Govt. Forest Division has obtained vide letter No.F-7-19/03/10-2 , Raipur dated 10/10/2005 under the Forest (Conservation) Act .
(v)	Adequate space should be provided for installation of the gas desulphurisation plant in future for control of sulphur dioxide.	Adequate space has been provided for installation of gas desulphurisation plant in future for control of sulphur dioxide.
(vi)	Acquisition of land should be restricted to 614 ha with the following break up:- Power plant-360 ha, Ash Dyke-198 ha, Colony-56ha. No additional area will be acquired for Phase-II including requirement for fly ash disposal.	Complied.
(vii)	Noise level should be limited to 85 dBA and regular maintenance of equipments be undertaken. For people working in the area of	The stipulated noise level is being maintained through installed acoustic hoods & enclosures and regular maintenance of equipments.

	generator halls & other high noise area, ear plugs should be provided.	Earplugs & Earmuffs have been provided to the employees working in the noise generating areas. Records of noise level has been maintained and report for the period from October, 2022 to March, 2023 is enclosed as ***Annexure-2***
(viii)	For controlling fugitive dust, regular sprinkling of water in coal handling and other vulnerable areas of the plant should be ensured.	JPL has installed rain gun & sprinklers for controlling fugitive emission and to control catch the fires at coal stock yard. Regular water sprinkling is carried out at all the vulnerable area including Coal Handling area for controlling fugitive dust emission. Road sweeping machine is also being used for regular road cleaning. Fugitive emission report near the fugitive emission sources like Coal Handling area & fly ash silo area is attached as **Annexure-3**
(ix)	A greenbelt of 100 m width will be created all along the plant boundary. Greenbelt will also be created along the ash disposal area. A norm of 1500 -2000 trees per ha should be followed. A detailed proposal of green belt creation including aftercare, gap filling, monitoring etc. should be prepared along with financial requirements and submitted to the Ministry by 31st December, 1997.	Green belt along the plant boundary has been developed and the same is being strengthened through gap plantation. Greenbelt has also been created along the ash disposal area. Saplings have been planted as per the CPCB guidelines. Plantation development status for the year 2022-23 is enclosed as **Annexure -4.** A detailed proposal for green belt development had been already submitted to the Ministry.
(x)	Continuous monitoring of ground water should be undertaken in project impact area by establishing good network of observation wells in consultation with the Central Ground Water Board. Result & data collected should be analyzed to ascertain the status of water quality and findings should be submitted.	A network of observation wells and piezometers have been established in impact area in consultation with Central Ground Water Board and monitoring the ground water quality at regular intervals. Ground & surface water quality reports for the month of November- 2022 & February-2023 are enclosed as ***Annexure -5.***
(xi)	All effluents generated in various plant activities should be collected in the Central Effluent Treatment Plant and treated to ensure adherence to specified standards of discharge.	Treated water from the Neutralization pit, Boiler blow down and Cooling tower blow down are taken to Central Monitoring Basin (Guard pond) after treatment it is reused in ash slurry preparation. 100% decanted ash water from ash dyke is recirculated and reused for ash slurry preparation. Treated effluent Monitoring Report for the period from Oct, 2022 to March, 2023 is enclosed as **Annexure- 6.**
(xii)	Provision shall be made for collection of fly ash in dry form. Close conveyor system with dust suppression mechanism shall be used for transport of coal from the mine and for carrying the ash to the disposal areas. Adequate	Dry fly ash is collected through pneumatic conveying system in 2 No. ash silos of capacity 1600 Tonnes each. Coal is transported in environment friendly manners. Dry fly ash is transported by covered trucks by

	provision should be made for sprinkling of water at strategic locations to ensure that fly ash does not get air borne.	maintaining sufficient moisture for utilization in brick manufacturing, land filling, Mine backfilling, ash dyke raising etc. Wet ash is disposed to ash dyke through ash slurry pipelines. Water level is always maintained in the ash dyke in such a way that there is no fugitive dust emission from the ash dyke.
(xiii)	Ash pond area should be provided with impervious lining and suitable drainage provision should be made around the coal stock yard.	Ash pond area is provided with clay compacted impervious/LDPE lining layer as per CPCB guidelines. Suitable drainage provision with sedimentation pit is made around the coal stockyard.
(xiv)	Fly ash generated will be fully utilized within 10 years starting with 20% utilization from the year of operation of the project with the additional utilization of 10% every year.	All out efforts are being made to utilize ash in accordance with the Fly ash utilization notification. Currently, JPL is utilizing the fly ash in back filling of mine along with OB in Gare Palma IV/1 and Gare Palma IV/2&3 coal mines. JPL had signed MoU with SECL for ash disposal in Gare Palma IV/2& 3 coal mines. The copy of the MoU is attached as **Annexure-7 (a).** Further, ash is also being back filled in Gare IV/1 coal mine owned by JPL, Tamnar as per approved mine plan. Ash is also being used in manufacturing fly ash bricks. The copy of MoU signed with fly ash brick manufactures is Attached as **Annexure- 7 (b).** Ash is also being filled in low lying area filling. The copy of NOC for disposing fly ash in low lying area from CECB, Raigarh is attached as **Annexure- 7 (c).**
(xv)	Detailed survey of flora and fauna along Kurkut river/ submergence area shall be carried out in consultation with the institution like BSI, ZSI, WLI, Dehra Dun, local recognized Universities, Institutions etc. and the report should be submitted within six months.	Detailed survey of flora and fauna along Kurket river/ submergence area had been carried out by Prof.A.K.Girolkar, Principal & Professor (Botany), K.G. Science & Arts College, Raigarh, Chhattisgarh. The report has already been submitted to the Ministry.
(xvi)	Project affected people should be adequately compensated and rehabilitated as per the State Govt. norms in consultation with the State authorities. The final R&R Programme and package should be submitted within six months. The project colony should be located 6-8 kms away from the plant site to avoid direct impact of the project.	All land holders affected by the project have been compensated as per directives of State Govt. of C.G. and as such no R&R issue is pending. The colony is located at 6.5 km away from the plant site in upwind direction.
(xvii)	Adequate financial provision should be made for implementation of environmental mitigative measures with adequate scope for its enhancement, if required in future.	Complied as per EMP provided in the EIA Report.
(xiii)	Regular monitoring for SPM, SO_2 and NOx around the power plant may be carried out and records maintained. The data so collected	PM_{10}, $PM_{2.5}$, SO_2, NOx and CO are regularly monitored in and around the power plant and records are properly maintained. The collected

	should be properly analyzed and submitted to the Ministry every six months.	data are regularly submitted to the Ministry in every six months. The data for the period of October, 2021 to March, 2022 are enclosed as **Annexure- 8.**
(xix)	Full cooperation should be extended to the Scientists/ Officers from the Regional Office of the Ministry at Bhopal/ the CPCB/ the SPCB who would be monitoring the compliance of environmental status. Complete set of impact assessment report and the Management Plans should be forwarded to the Regional Office/ the CPCB/ the SPCB for their use during monitoring.	Noted.
(xx)	Monitoring Committee should be constituted for reviewing the compliance to various safeguard measures by involving recognized local NGOs, Pollution Control Boards, Institutions, Experts etc.	Request letter for formation of Monitoring Committee was already submitted to Chhattisgarh Environment Conservation Board, Regional Office vide letter No.JPL/EMD/RO/OCT-2010 dated 7/10/2010. Again JPL has expedited the matter with Regional Office, Chhattisgarh Environment Conservation Board for formation of Monitoring Committee. However, we have engaged ISM, Dhanbad/IIT, Kharagpur for monitoring of compliance to various safeguard measures. The latest report is attached as **Annexure-9.**
3	The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry.	Noted.
4	In case of any deviation or alteration in the project from proposed those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the condition(S) imposed and to add additional environmental protection measures required, if any.	Noted.
5	The above stipulations shall be enforced among others as under the water (Prevention and Control of Pollution) Act, 1974 , the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act,1986, the Public Liability Insurance Act,1991 and rules there under, the Environment Impact Assessment notification of January ,1994 and its amendments.	Noted.
	Additional Conditions (as per MoEF Memorandum No.J.11013/41/2006-IA.II (I) dated 06.04.2011)	
(i)	Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) shall be carried out and continuous records maintained. Based on the monitored data, necessary corrective measures as may	Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) is being carried out and continuous records are maintained. Results of monitoring are being submitted to the Regional Office of

	be required from time to time shall be taken to ensure that the levels are within permissible limits. The results of monitoring shall also be submitted to the respective Regional Office of MoEF regularly. Besides, the results of monitoring will also be put on the website of the company in the public domain.	MoEF regularly. Results of monitoring are being regularly uploaded on website of JPL. The real time data of CEMS and CAAQMS are uploaded on CPCB & CECB servers.
(ii)	The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environment clearance conditions shall be put on the website of the company and also regularly updated. The monitored data shall also be submitted to respective State Pollution Control Board/UTPCCs and the Regional Office of MoEF.	The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environmental clearance conditions are being regularly uploaded on website. Monitored data are being regularly submitted to CECB-Raipur and the Regional Office of MoEF.
(iii)	The ambient air quality data as well as the stack emission data will also be displayed in public domain at some prominent place near the main gate of the company and updated in real time.	Ambient air quality data and the stack emission data is being displayed in public domain near the main gate of the company and updated in real time.

Jindal Power Limited, Tamnar

Compliance Report of Environmental Clearance for Stage-II (2x250MW) of O.P. Jindal Super TPP, Tamnar vide letters No.J-13011/8/2006-IA.II (T) dated 08/06/2006, EC amendment No.J.13012/08/2006- IA.II (I) dated 03/01/2019 & No.J.13011/08/2006- IA.II (T) dated 13/08/2021 and additional conditions as per MoEF Office Memorandum No J-11013/41/2006-IA.II(I) dated 06/04/2011 & F.No.22-13/2019-IA.III dated 28/08/2019

Sl. No	Conditions	Compliance Status
(i)	All the conditions stipulated by Chhattisgarh Environment Conservation Board vide their letter no. 984/TS/CECB/2006 dated 23/02/06 shall be strictly implemented.	All the conditions stipulated by the Chhattisgarh Environment Conservation Board vide their letter no. 984/TS/CECB/2006 dated 23/02/06 are strictly implemented.
(ii)	**Amended condition as per as per MoEF Office Memorandum No.J.13011/08/2006-IA.II (T) dated 13/08/2021** No additional land for ash pond shall be acquired during phase-II of the project. The height of the existing ash dyke shall be limited to 18 m.	Noted, The area earmarked for ash dyke is 198 Ha. for both Phase-I (2x250MW) & Phase-II (2x250MW). No additional land is acquired for ash dyke for Phase- II (2x250MW). Noted.
(iii)	A 500 m distance from State highway and HFL of river Kelo to the plant site, ash pond and Township must be kept.	Complied.
(iv)	A copy of the requisite clearances from state government for construction of Rabo dam on Kurket River shall be submitted within one month of the receipt of this letter.	Copy of the requisite clearances from State Government for construction of Rabo dam on Kurket river has been already submitted to MoEF, New Delhi vide Letter No .AB/1000 MW/MoEF/509/001, dated 16/06/2006.
(v)	Ash in the coal to be used as fuel shall not exceed 40%.	The condition has been updated by MoEF&CC vide its notification no. S.O. 1561 (E) dated 21.05.2020. As per the said notification, MoEF&CC has permitted use of coal by TPPs without stipulations as regards to ash content or distance. The MoEF&CC vide this notification has stipulated that the existing ECs stand modified so as to make the above condition operative.
(vi)	Copy of coal linkage and stack height clearance shall be submitted within one month to the Ministry.	Copy of Coal Block allocation and Stack height clearance from the Airport Authority of India has been submitted to Ministry vide letter No.AB/1000MW/MoEF/509/001 dated 16/06/2006.
(vii)	A bi-flue stack of height 220 m and internal diameter of 4.75 m with continuous On-line monitoring system shall be installed. For adequate dispersal of gaseous pollutants, exit velocity shall be maintained at 25 m/sec by installing ID fans and continuous record of exit velocity shall also be maintained and submitted to the Ministry on a 6 monthly basis.	A bi-flue stack of height 220 m and internal diameter of 4.75 m with continuous on-line monitoring system has already been installed. ID fans are installed and exit velocity of 25 m/s is maintained. Report of exit velocity for the period of October, 2022 to March, 2023 is enclosed as ***Annexure- 1a &1b.***

(viii)	Electrostatic Precipitators (ESPs) with an efficiency of 99.9% efficiency shall be installed to limit particulate emission within 50 mg/Nm^3. Automatic system for shutting down the power plant in the event of non-functioning of ESPs shall be installed.	Electrostatic Precipitators (ESPs) with an efficiency of >99.9% have been installed. The ESP's are designed to achieve particulate emission below 50mg/Nm^3.Report of Particulate Matter for the period of October, 2022 to March, 2023 is enclosed as ***Annexure-1a&1b.*** Particulate emissions below 50 mg/Nm^3 is being ensured.
(ix)	100% fly ash utilization shall be achieved within 9 years in accordance with the notification on fly ash utilization SO 763 (E) dated 14th September, 1999 and the amendments made therein from time to time.	All out efforts are being made to utilize ash in accordance with the Fly ash utilization notification. The avenue include ash bricks, mine backfilling, road construction, ash dyke raising, low lying area filling etc.
(x)	COC of not less than 5 shall be adopted. No ground water shall be used for any purpose.	COC of not less than 5 is being maintained to ensure that minimum water is drawn for make-up purpose and intimated to MoEFCC through EC compliance report. However, the latest COC detail is attached as **Annexure- 10.**
(xi)	The treated effluents conforming to the prescribed standards shall be recirculated and reused within the plant. There shall be no waste water discharge into the surface water bodies, outside the plant boundary.	Treated effluents conforming to prescribed standards are re-circulated and re-used within the plant. Treated effluent Monitoring Report for the period from Oct, 2022 to March, 2023 is enclosed as Annexure- 6. Effluents are treated in Central Monitoring Basin (Guard pond) and is re-used in ash slurry preparation. No wastewater is discharged into the surface water bodies, outside the plant boundary.
(xii)	Rain water harvesting shall be adopted and a detailed scheme for rain water harvesting to recharge the ground water aquifer shall be prepared in consultation with Central Ground Water Authority/ State Ground Water Board. A copy of the same shall be submitted within three months to the Ministry	Water reservoir of 35 million cu.m capacity at the Rabo dam and 12 lakh cu.m capacity at plant site have been constructed. Rainwater harvesting technique has adopted in the residential colony and other office complexes at the site, as per proposal prepared in consultation with Mr. V.K. Jain, formerly Engineer-In-Chief, Public Health Engineering Department and Chairman, M.P. Pollution Control Board, Bhopal and as per the guidelines of Central Ground Water Authority/ State Ground Water Board. The report had been submitted to the Ministry vide letter No.JPL/RTPP/RKS/2.5/1897 dated 19/09/2006.
(xiii)	Continuous monitoring of ground water shall be undertaken in and around project impact area including ash pond area by establishing a network of observation wells in consultation with the Central Ground Water Board/ State Ground Water Board, as the ash pond lies in the catchment of river Pajhar. Data collected shall be analyzed to ascertain the status of water quality and results furnished to the Regional Office of this Ministry.	A network of observation wells and piezometers have been established in and around impact area including ash pond in consultation with Central Ground Water Board and monitoring the ground water quality at regular intervals. Results are submitted regularly to Ministry & its Regional Office, CPCB zonal office and CECB-Raipur. Ground & surface water quality reports for the month of November- 2022 & February-2023 are enclosed as **Annexure –5.**

(xiv)	Green belt of 100 m width shall be developed all around the power plant and ash pond area. One third (1/3) of the total plant area (phase-I&II) should be used for green belt development. **(As amended vide MoEF letter No. J-13011/8/2006-IA. II (T) dt. 25/04/07)** A green belt of 100 m width shall be developed all around the power plant covering approximately 1/3rd of power plant area. Greenbelt with an average width of 45 m shall also be developed around the ash dyke covering about 24 ha area.	Green belt along the plant boundary has been developed and the same is being strengthened through gap plantation. Greenbelt of 45m width has also been developed the ash disposal area. Saplings have been planted as per the CPCB guidelines. Plantation development status for the year 2022-23 is enclosed as **Annexure -4.**
(xv)	The project proponent shall take all precautionary measures during construction and operation of power plant for conservation and protection of endangered faunal species i.e. Sloth Bear (Melursus ursinus), Common Jungle Cat (Felis chaus), Indian Python (Python molurus), Rat Snake (Ptysus mucosus), Indian Cobra (Naja naja), Lizard (Varanus monitor) etc, reported in the study area, in consultation with the state Wildlife Dept. Action plan for conservation of endangered fauna shall be prepared and submitted to the Ministry & its Regional Office within 3 months.	The conservation plan as stipulated in the Environmental clearance was drawn in consultation with the State Wildlife Department, Raipur in the year 2006 and the same was submitted to the MoEF vide letter dated 19.09.2006.The conservation measures suggested in the plan for conservation of the endangered fauna species included habitat conservation through afforestation, pasture land development, awareness programmes, etc. The Company conducts regular awareness programmes. The company has also undertaken extensive afforestation measures by planting more than 2.6 million saplings.
(xvi)	First aid and sanitation arrangements shall be made for the drivers and other contract workers during the construction phase.	Complied.
(xvii)	Leq of Noise level shall be limited to 75 dBA and regular maintenance of equipment be undertaken. For people working in the high noise areas, personal protection devices should be provided.	Noise level is being maintained within the prescribed limit. Earplugs & Earmuffs have been providing to the employees working in the noise generating areas. Records of noise level has been maintained and report for the period from October, 2022 to March, 2023 is enclosed as **Annexure-2**
(xiii)	Regular monitoring of the ambient air quality shall be carried out in and around the power plant and records maintained. Periodic six monthly reports should be submitted to the Regional Office of this Ministry.	Ambient air quality is being monitored in and around the power plant and records are being maintained. The reports are being submitted to the Regional Office of Ministry regularly in every six months. The reports for the period from October, 2022 to March, 2023 is enclosed are enclosed as **Annexure- 8.**
(xix)	For controlling fugitive dust, regular sprinkling of water in coal storage area and other vulnerable areas of the plant shall be ensured.	JPL has installed rain gun & sprinklers for controlling fugitive emission and to control catch the fires at coal stock yard. Regular water sprinkling is carried out at all the vulnerable area including Coal Handling area for controlling fugitive dust emission. Road sweeping machine is also being used for regular road cleaning.
(xx)	The project proponent should advertise in at	The information regarding advertisement in two

	least two local newspapers widely circulated in the region around the project, one of which should be in the vernacular language of the locality concerned, informing that the project has been accorded environmental clearance and copies of clearances letters 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.	local newspapers informing the project has been accorded environmental clearance has been sent to MoEF, New Delhi vide Letter No. AG/1000MW/MoEF/509/002, dt. 24/06/2006.
(xxi)	A separate environment monitoring cell with suitable qualified staff should be set up for implementation of the stipulated environmental safeguards.	Environment Management Department is already in place with qualified and experienced staff for implementation of the stipulated environmental safeguards.
(xxii)	Half yearly report on the status of implementation of the stipulated conditions and environmental safeguards should be submitted to this Ministry/ Regional Office/ CPCB/ SPCB.	Half yearly report on the status of implementation of the stipulated conditions and environmental safeguards is being submitted to Ministry, Regional Office of Ministry, CPCB and SPCB.
(xxiii)	Regional Office of the Ministry of Environment & Forests located at Bhopal will monitor the implementation of the stipulated conditions. Complete set of 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 during monitoring.	Noted.
(xxiv)	Separate funds should be allocated for implementation of environmental protection measures along with item-wise break-up. This cost should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	Separate funds for implementation of environmental protection measures have been allocated as part of the project cost. Year wise (April to March) expenditure details are being submitted regularly to the Ministry. The expenditure details is attached as **Annexure-11**
(xxv)	Full cooperation should be extended to the Scientists/ Officers from the Ministry/ Regional Office of the Ministry at Bhopal/ the CPCB/ the SPCB who would be monitoring the compliance of environmental status.	Noted.
4	The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry.	Noted.
5	The environmental clearance accorded shall be valid for a period of 5 years for starting construction/Operation of the power plant. In case, the project authorities fail to do so within this stipulated period, the environmental clearance shall stand lapsed automatically.	Plant has been constructed/ operating within the stipulated period. The Unit-1,2,3 & 4 were commissioned on 08/12/2007, 15/06/2008, 06/04/2008 & 05/09/2008 respectively.
6	In case of any deviation or alteration in the project from proposed those submitted to this	Noted.

	Ministry for clearance ,a fresh reference should be made to the Ministry to assess the adequacy of the condition(S) imposed and to incorporate additional environmental protection measures required, if any.	
7	The above stipulations shall be enforced along with others as under the water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act,1986 and rules there under, The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, Hazardous Wastes (Management and Handling) Rules,1989, the Public Liability Insurance Act,1991 and rules there under, the Environment Impact Assessment notification of January,1994 and their subsequent amendments.	Noted.
	Additional Conditions (as per MoEF Office Memorandum No.J.11013/41/2006-IA.II (I) dated 06/04/2011)	
(i)	Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) shall be carried out and continuous records maintained. Based on the monitored data, necessary corrective measures as may be required from time to time shall be taken to ensure that the levels are within permissible limits. The results of monitoring shall also be submitted to the respective Regional Office of MoEF regularly. Besides, the results of monitoring will also be put on the website of the company in the public domain.	Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) is being carried out and continuous records are maintained. Results of monitoring are being submitted to the Regional Office of MoEF regularly. Results of monitoring are being regularly uploaded on website of JPL. The real time data of CEMS and CAAQMS are uploaded on CPCB & CECB servers.
(ii)	The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environment clearance conditions shall be put on the website of the company and also regularly updated. The monitored data shall also be submitted to respective State Pollution Control Board/UTPCCs and the Regional Office of MoEF.	The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environmental clearance conditions are being regularly uploaded on company website. Monitored data are being regularly submitted to CECB-Raipur and the Regional Office of MoEF.
(iii)	The ambient air quality data as well as the stack emission data will also be displayed in public domain at some prominent place near the main gate of the company and updated in real time.	Ambient air quality data and the stack emission data is being displayed in public domain near the main gate of the company and updated in real time.
	Additional Conditions (as per MoEFCC Office Memorandum No.J.13012/08/2006- IA.II (I) dated 03/01/2019)	
(i)	Groundwater analysis is to be carried out at the upstream / downstream of the existing fly ash pond by creating a network with the existing	A network of observation wells and piezometers have been established in and around impact area including ash pond and monitoring the

	wells and installing new piezometers and report be submitted that no leaching is taking place due to fly ash dumping.	ground water quality at regular intervals. Results are submitted regularly to Ministry & its Regional Office, CPCB zonal office and CECB-Raipur. Ground & surface water quality reports for the month of November- 2022 & February-2023 are enclosed as **Annexure -5**
(ii)	Alternate technology for fly ash utilization such as road making using geopolymer shall be explored with the institutes of national repute.	The Company had requested Director General, Council of Scientific and Industrial Research (CSIR), New Delhi to facilitate the company for use of alternate new technology to utilize dry fly ash. However, no response was received. However, the company has been using ash for road making. JPL has also supplying ash to the Public Works Department for utilization in the construction of road/ embankment as per requirement received.
(iii)	The approved ash pond site at village Dolesara/ Roadapalli in an area of 239 ha vide ministry's letter dated 26.4.2017 for disposal of ash generated from 4X600 MW Power Plant shall be operationalized within one year so that there should not be any necessity to further raise the existing dyke height.	CECB vide its letter dated 27.04.2022 has issued the amendment of CTE of 4X600 MW TPP for new ash dyke.
	Additional Conditions **(as per MoEF Office Memorandum No.J.13011/08/2006- IA.II (T) dated 13/08/2021)**	
(i)	No further raising of ash dyke shall be proposed beyond RL 286m.	Noted.
(ii)	100% ash utilization shall be carried out throughout the year.	Noted.
(iii)	Disaster management plan shall be finalized and implemented after discussion with local authority.	Complied with.
	Additional conditions as per MoEF Office Memorandum F.No.22-13/2019-IA.III dated 28/08/2019	
i	The guidelines prepared by CPCB for disposal of fly ash for reclamation of low lying areas and in stowing / backfilling of abandoned mines/quarries shall be followed during disposal of ash in abandoned or working mines, as annexed.	JPL has followed all the guidelines prepared by CPCB for disposal of fly ash for reclamation of low lying areas and in stowing/backfilling of abandoned mines/quarries during disposal of ash in abandoned or working mines.
ii	There should at least be clearance of 500 m of safe distance be maintained from River and water body in case of ash dispoal in abandoned mines to prevent embankment failures and flyash flowing into the nearby water body.	JPL has maintained safe distance of 500 m for ash disposal in abandoned mines to prevent embankment failures and fly ash flowing into the nearby water body.
iii	The top layer of the fly ash disposal area in the abandoned mines shall be kept moist during disposal.	Being complied.
iv	Top layer of the disposed area should have 70 cm overburden or gravels/stones and then 30	Being complied.

	cm sweet soil cover. Subsequently, the vegetation shall be raised on the soil cover.	
v	Bioaccumulation and bio-magnification tests shall be conducted on surrounding flora and fauna (tree leaves, vegetation, crop yields and cattle population) during shall be pre-monsoon and post monsoon to find out any trace metals escaped through groundwater or runoff.	JPL has engaged IIT, Kharagpur for conducting monitoring & analysis of Geo-Environmental Parameters of Coal Mines in quarterly basis. No evidence found for any trace metals escaped through groundwater or runoff. Latest report is attached as **Annexure-12.**
vi	Surface runoff and supernatant water in any case shall not be let into the surrounding areas. It shall be collected by providing adequate drain around the mine. The supernatant water along with surface runoff shall be treated and re-used for mixing ash and plant operations.	Garland drains has provided for collection of surface runoff and supernatant water generated from Mine. The supernatant water along with surface runoff are collected & treated in Guard pond & ETP and reuse for ash slurry preparation.
vii	To the extent possible, only decanted water from mine, make up water from treated effluents such as cooling tower blow down and treated sewage water shall be used for making ash slurry.	Being complied.
viii	Fly ash to be used as soil conditioner in agriculture needs and to be applied in controlled manner to limit excessive application so as to prevent soil degradation. The optimize proportion of ash to be applied which is to be certified by the state Agricultural Universities /Colleges based on the soil testing.	Noted for compliance as per requirement.
ix	Approval from DGMS shall be obtained before disposing the ash in mine voids.	Approval of DGMS was taken at the time of beginning back filling of mine using ash in the year 2009.
x	Technology for conversion of fly ash into coarse granules for stowing in the underground mines to be explored	Noted for compliance as per requirement. However, presently no stowing in underground mine is being done.
xi	All the power plants should install different silos for dry collection of fly ash.	Silos have been provided for dry collection of ash
xii	Records pertaining to details of month-wise quantity of fly ash disposed and water consumption along with nature/source of water shall be maintained and submitted to Ministry Regional office annually	The record of fly ash and water consumed is being maintained regularly and submitted along with fly ash audit report to CPCB, CECB & IRO Ministry Regional office annually. The fly ash implementation report (Annual Report) for the FY 22-23 is attached as **Annexure -13**
xiii	Before starting the disposal of ash into mine voids, the NOC /Permission from the mine owner is to be obtained in case the mine closure activity are not completed or State Government in case the mine has been handed over to the State Govt. after its closure. A copy of such NOC / Permission isto be submitted to the ministry and its Regional Office	Currently, JPL has disposing the fly ash in Gare Palma IV/1 and Gare Palma IV/2&3 coal mines. JPL has signed MoU with SECL for ash disposal in Gare Palma IV/2& 3 coal mines. The copy of the MoU is attached as Annexure-13. Gare IV/1 coal mine owned by JPL, Tamnar and ash disposal is being done as per approved mine plan.

Jindal Power Limited, Tamnar

Annexure-1a

STACK MONITORING REPORT (4X250 MW TPP) OF OCTOBER , 2022 TO MARCH 2023

Month	Name of the Unit	Stack height (Mtr.)	Stack diameter (Mtr.)	Exit Velocity (m/sec)	Concentration of PM (mg/Nm^3)
Oct-22	Unit-1	220	4.75	25.0	38.0
	Unit-2			25.0	41.0
	Unit-3			25.1	40.0
	Unit-4			24.9	39.0
Nov-22	Unit-1	220	4.75	25.2	40.0
	Unit-2			25.1	38.0
	Unit-3			25.4	42.0
	Unit-4			25.6	37.0
Dec-22	Unit-1	220	4.75	25.0	41.0
	Unit-2			25.0	40.0
	Unit-3			25.1	38.0
	Unit-4			25.1	42.0
Jan-23	Unit-1	220	4.75	25.1	38.0
	Unit-2			25.3	42.0
	Unit-3			25.5	40.0
	Unit-4			25.8	36.0
Feb-23	Unit-1	220	4.75	25.0	44.5
	Unit-2			25.1	45.0
	Unit-3			25.0	43.5
	Unit-4			25.0	44.0
Mar-23	Unit-1	220	4.75	25.2	40.5
	Unit-2			25.0	39.4
	Unit-3			24.9	37.8
	Unit-4			25.1	41.3

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HDD-272, Phase III - Near JP Chowk
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099
Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1996

Name & Address Of The Customer			
To, Jindal Power Limited P.O. Tamnar, District: Raigarh 496107 (C.G.)	REPORT NO	UES/TR/22-23/07007	
	LAB REF NO	UES/22-23/ST/014758	
	DATE OF SAMPLING	05/01/2023	
	SAMPLING TIME	05.29 pm	
	DATE OF RECEIPT	06/01/2023	
	DATE OF REPORT	10/01/2023	
	DATE OF ANALYSIS	START:06/01/2023	END:10/01/2023

SAMPLE DETAILS	
MONITORING FOR	STACK EMISSION MONITORING
CUSTOMER REF. NO. & DATE	4400016514 DATED: 11.11.2022
SAMPLING LOCATION	4 X 250 MW (UNIT - I)
SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	IS 11255 PART 1,2:1985 REAFFIRMED 2009; PART 3:2008, PART 7:2005 REAFFIRMED 2012,IS 5182 (PART 10) :2003
SAMPLE QUANTITY/PACKING	THIMBLE: 1 X 1 NO., SO2: 30 ML X 1 NO. PVC BOTTLE, NOX: 25 ML X 1 NO. PVC BOTTLE, RUBBER BLADDER: 1 X 1 NO., HG: 500ML X 1 NO. GLASS BOTTLE & 500ML X 3 NO.PVC BOTTLE.

REPORT NO. 07007

TEST REPORT

Stack details	
STACK IDENTITY	4 X 250 MW (UNIT -I)
STACK ATTACHED TO	PEP
MATERIAL OF CONSTRUCTION	RCC/MS
STACK HEIGHT ABOVE GROUND LEVEL (MTR.)	220
STACK DIAMETER (MTR.)	4.75
STACK SHAPE AT TOP	CIRCULAR
TYPE OF FUEL	COAL

Parameter	Unit	Result	Limit	Method Reference
FLUE GAS TEMPERATURE	°C	123	-	IS 11255 (Part 3):2008
FLUE GAS VELOCITY	M/s	25.3	-	IS 11255 (Part 3):2008
TOTAL GAS QUANTITY	Nm^3/h	1213950.5	-	IS 11255 (Part 3):2008
TOTAL PARTICULATE MATTER (TPM)	mg/Nm^3	39.0	50	IS 11255 (Part 1):1985, RA 2003
SULPHUR DIOXIDE (SO_2)	mg/Nm^3	1446	200	IS 11255 (Part 2):1985, RA 2003
OXIDES OF NITROGEN (NO_x)	mg/Nm^3	446.2	450	IS 11255 (Part 7):2005, RA 2012
CARBON MONOXIDE (CO)	%	<1.0	-	IS 13270 RA 2019
OXYGEN (O2)	%	6.9	-	IS 13270: RA 2009
CARBON DIOXIDE (CO2)	%	12.8	-	IS 13270: RA 2009
HYDROGEN SULPHIDE (H_2S)	mg/Nm^3	0.157	-	IS 11255 Part 4

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REPORT NO. 07007

TEST REPORT

HYDROGEN CHLORIDE (HCL)	mg/Nm^3	0.13	-	USEPA Method No. 26 A
MOISTURE	%	6.1	-	IS :11255:(Part 3):2008
AMMONIA (NH3)	mg/Nm^3	0.512	-	IS 11255 Part - 6
MERCURY (Hg)	mg/Nm^3	N.D.	0. 03	USEPA Method No. 29

REMARKS: Results Are As Above

Terms & conditions

- *The report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only*

10/01/23	ULTIMATE ENVIROLYTICAL SOLUTIONS	For ULTIMATE ENVIROLYTICAL SOLUTIONS
REVIEWED BY		**AUTHORIZED SIGNATORY**

----------End of the test report.....

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Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	REPORT NO	UES/TR/22-23/07008	
	LAB REF NO	UES/22-23/ST/014759	
	DATE OF SAMPLING	05/01/2023	
	SAMPLING TIME	11.59 am	
	DATE OF RECEIPT	06/01/2023	
	DATE OF REPORT	10/01/2023	
	DATE OF ANALYSIS	START: 06/01/2023	END: 10/01/2023

SAMPLE DETAILS	
MONITORING FOR	STACK EMISSION MONITORING
CUSTOMER REF. NO. & DATE	4400016514 DATED: 11.11.2022
SAMPLING LOCATION	4 X 250 MW (UNIT – II)
SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	IS 11255 PART 1,2:1985 REAFFIRMED 2009; PART 3:2008, PART 7:2005 REAFFIRMED 2012, IS 5182 (PART 10) :2003
SAMPLE QUANTITY/PACKING	TRIMBLE: 1 X 1 NO., SO2: 30 ML X 1 NO. PVC BOTTLE, NOX: 25 ML X 1 NO. PVC BOTTLE, RUBBER BLADDER: 1 X 1 NO., NG: 500ML X 1 NO. GLASS BOTTLE & 500ML X 3 NO.PVC BOTTLE.

REPORT NO. 07008

TEST REPORT

Stack details

STACK IDENTITY	4 X 250 MW (UNIT -II)
STACK ATTACHED TO	ESP
MATERIAL OF CONSTRUCTION	RCC/MS
STACK HEIGHT ABOVE GROUND LEVEL (MIN.)	220
STACK DIAMETER (MTR.)	4.75
STACK SHAPE AT TOP	CIRCULAR
TYPE OF FUEL	COAL

Parameter	Unit	Result	Limit	Method Reference
FLUE GAS TEMPERATURE	°C	123.7	-	IS 11255 (Part 3):2008
FLUE GAS VELOCITY	M/s	25.6	-	IS 11255 (Part 3):2008
TOTAL GAS QUANTITY	Nm^3/h	1226177.7	-	IS 11255 (Part 3):2008
TOTAL PARTICULATE MATTER (TPM)	mg/Nm^3	41.6	50	IS 11255 (Part 1):1985, RA 2003
SULPHUR DIOXIDE (SO2)	mg/Nm^3	1155	200	IS 11255 (Part 2):1985, RA 2003
OXIDES OF NITROGEN (NOX)	mg/Nm^3	339	450	IS 11255 (Part 7):2005, RA 2012
CARBON MONOXIDE (CO)	%	<1.0	-	IS 13270 RA 2019
OXYGEN (O2)	%	8.3	-	IS 13270: RA 2009
CARBON DIOXIDE (CO2)	%	10.5	-	IS 13270: RA 2009
HYDROGEN SULPHIDE (H2S)	mg/Nm^3	0.146	-	IS 11255 Part 4

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REPORT NO. 07008

TEST REPORT

HYDROGEN CHLORIDE (HCL)	mg/Nm^3	0.21	-	USEPA Method No. 26 A
MOISTURE	%	6.2	-	IS :11255:(Part 3):2008
AMMONIA (NH3)	mg/Nm^3	0.235	-	IS 11255 Part - 6
MERCURY (HG)	mg/Nm^3	N.D.	0.03	USEPA Method No. 29

REMARKS: Results Are As Above

Terms & conditions

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10/01/23		For ULTIMATE ENVIROLYTICAL SOLUTIONS
REVIEWED BY		**AUTHORIZED SIGNATORY**

----------End of the test report.....

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Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	REPORT NO	UES/TR/22-23/07009	
	LAB REF NO	UES/22-23/ST/014760	
	DATE OF SAMPLING	05/01/2023	
	SAMPLING TIMES	05.19 pm	
	DATE OF RECEIPT	06/01/2023	
	DATE OF REPORT	10/01/2023	
	DATE OF ANALYSIS	START: 06/01/2023	END: 10/01/2023

SAMPLE DETAILS	
MONITORING FOR	STACK EMISSION MONITORING
CUSTOMER REF. NO. & DATE	4400016514 DATED: 11.11.2022
SAMPLING LOCATION	4 X 250 MW (UNIT – III)
SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	IS 11255 PART 1,2:1985 REAFFIRMED 2005; PART 3:2008, PART V:2005 REAFFIRMED 2012,IS 5182 (PART 10) :2003
SAMPLE QUANTITY/PACKING	TRIMSLE: 1 X 1 NO., SO2: 35 ML X 1 NO. PVC BOTTLE, NOX: 25 ML X 1 NO. PVC BOTTLE, RUBBER BLADDER: 1 X 1 NO., HG: 500ML X 1 NO. GLASS BOTTLE & 500ML X 3 NO.PVC BOTTLE.

REPORT NO. 07009

TEST REPORT

Stack details	
STACK IDENTITY	4 X 250 MW (UNIT -III)
STACK ATTACHED TO	ESP
MATERIAL OF CONSTRUCTION	RCC/MS
STACK HEIGHT ABOVE GROUND LEVEL (MTR.)	220
STACK DIAMETER (MTR.)	4.75
STACK SHAPE AT TOP	CIRCULAR
TYPE OF FUEL	COAL

Parameter	Unit	Result	Limit	Method Reference
FLUE GAS TEMPERATURE	°C	116.3	-	IS 11255 (Part 3):2008
FLUE GAS VELOCITY	M/s	25.5	-	IS 11255 (Part 3):2008
TOTAL GAS QUANTITY	Nm^3/h	1244604.6	-	IS 11255 (Part 3):2008
TOTAL PARTICULATE MATTER (TPM)	mg/Nm^3	41.8	50	IS 11255 (Part 1):1985, RA 2003
SULPHUR DIOXIDE (SO2)	mg/Nm^3	1221	200	IS 11255 (Part 2):1985, RA 2003
OXIDES OF NITROGEN (NOX)	mg/Nm^3	327.4	450	IS 11255 (Part 7):2005, RA 2012
CARBON MONOXIDE (CO)	%	<1.0	-	IS 13270 RA 2019
OXYGEN (O2)	%	8.6	-	IS 13270: RA 2009
CARBON DIOXIDE (CO2)	%	11.2	-	IS 13270: RA 2009
HYDROGEN SULPHIDE (H2S)	mg/Nm^3	0.163	-	IS 11255 Part 4

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REPORT NO. 07009

TEST REPORT

HYDROGEN CHLORIDE (HCl)	mg/Nm³	0.16	-	USEPA Method No. 26 A
MOISTURE	%	6.1	-	IS :11255:(Part 3):2008
AMMONIA (NH_3)	mg/Nm³	0.27	-	IS 11255 Part - 6
MERCURY (Hg)	mg/Nm³	N.D.	0.03	USEPA Method No. 29

REMARKS: Results Are As Above

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----------*End of the test report*----------

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Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

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Name & Address Of The Customer

To,
Jindal Power Limited
P.O. Tamnar,
District: Raigarh
496107 (C.G.)

REPORT NO	UES/TR/22-23/07010	
LAB REF NO	UES/22-23/ST/014761	
DATE OF SAMPLING	05/01/2022	
SAMPLING TIME	3.30 pm	
DATE OF RECEIPT	06/01/2023	
DATE OF REPORT	10/01/2023	
DATE OF ANALYSIS	START:06/01/2023	END:10/01/2023

SAMPLE DETAILS

MONITORING FOR	STACK EMISSION MONITORING
CUSTOMER REF. NO. & DATE	4400016514 DATED: 11.11.2022
SAMPLING LOCATION	4 X 250 MW (UNIT - IV)
SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	IS 11255 PART 1,2:1985 REAFFIRMED 2009; PART 3:2008, PART 7:2005 REAFFIRMED 2012,IS 5182 (PART 10) :2003
SAMPLE QUANTITY/PACKING	THIMBLE: 1 X 1 NO., SO2: 30 ML X 1 NO. PVC BOTTLE, NOX: 25 ML X 1 NO. PVC BOTTLE, RUBBER BLADDER: 2 X 1 NO., HG: 500ML X 1 NO. GLASS BOTTLE & 500ML X 3 NO.PVC BOTTLE.

REPORT NO. 07010

TEST REPORT

Stack details

STACK IDENTITY	4 X 250 MW (UNIT -IV)
STACK ATTACHED TO	ESP
MATERIAL OF CONSTRUCTION	RCC/MS
STACK HEIGHT ABOVE GROUND LEVEL (MIN.)	220
STACK DIAMETER (MIN.)	4.75
STACK SHAPE AT TOP	CIRCULAR
TYPE OF FUEL	COAL

Parameter	Unit	Result	Limit	Method Reference
FLUE GAS TEMPERATURE	°C	122.4	-	IS 11255 (Part 3):2008
FLUE GAS VELOCITY	M/s	25.7	-	IS 11255 (Part 3):2008
TOTAL GAS QUANTITY	Nm^3/h	1235014.6	-	IS 11255 (Part 3):2008
TOTAL PARTICULATE MATTER (TPM)	mg/Nm^3	40.3	50	IS 11255 (Part 1):1985, RA 2003
SULPHUR DIOXIDE (SO2)	mg/Nm^3	1347	200	IS 11255 (Part 2):1985, RA 2003
OXIDES OF NITROGEN (NOX)	mg/Nm^3	448.3	450	IS 11255 (Part 7):2005, RA 2012
CARBON MONOXIDE (CO)	%	<1.0	-	IS 13270 RA 2019
OXYGEN (O2)	%	7.4	-	IS 13270: RA 2009
CARBON DIOXIDE (CO2)	%	12.3	-	IS 13270: RA 2009
HYDROGEN SULPHIDE (H_2S)	mg/Nm^3	0.169	-	IS 11255 Part 4

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REPORT NO. 07010

TEST REPORT

HYDROGEN CHLORIDE (HCl)	mg/Nm^3	0.26	-	USEPA Method No. 26 A
MOISTURE	%	5.3	-	IS :11255:(Part 3):2008
AMMONIA (NH$_3$)	mg/Nm^3	0.346	-	IS 11255 Part - 6
MERCURY (Hg)	mg/Nm^3	N.D.	0.03	USEPA Method No. 29

REMARKS: Results Are As Above

Terms & conditions

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- *This is for information as the party has asked for above test(s) only*

19/01/23

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----------*End of the test report*----------

Annexure-2

NOISE LEVEL MONITORING REPORT													
S.No.	**Monitoring Location**	**Oct-22**		**Nov-22**		**Dec-22**		**Jan-23**		**Feb-23**		**Mar-23**	
		Day Time	**Night Time**	**Day Time**	**Night Time**	**Day Time**	**Night Time**	**Day Time**	**Night Time**	**Day Time**	**Night Time**	**Day Time**	**Night Time**
		Noise Level dB(A)											
1	Plant boundary Near Gate No. 1	65.4	55.7	63.8	52.4	62.7	50.6	63.8	51.2	62.8	48.7	60.3	46.7
2	Plant boundary Near Gate No. 2	68.6	56.8	67.5	54.6	65.6	52.3	66.4	54.1	65.4	55.3	63.7	53.2
3	Plant boundary Near Gate No. 3	70.5	58.6	68.2	56.3	66.8	54.7	68.3	56.3	66.7	54.6	65.4	52.8
4	Near Urjabhawan	66.3	54.4	64.7	53.7	65.4	50.5	63.9	52.7	64.2	50.3	60.6	49.7
5	Switch Yard (400 KV)	67.8	64.3	66.4	62.8	67.5	64.3	66.7	63.4	67.1	63.8	65.5	62.4
6	Reservoir area	64.2	54.1	63.9	52.5	64.3	50.4	65.1	51.6	64.6	50.3	63.8	48.6
7	Outside ADM block	60.1	46.2	58.3	45.1	56.6	46.7	54.5	43.9	52.5	45.1	50.5	44.3
8	Near Hostel No.2	56.8	40.3	55.6	43.9	53.2	40.5	50.4	40.7	52.3	40.2	48.2	38.4
9	Near Kelo Vihar Colony	60.7	50.5	62.1	48.2	64.6	50.7	66.2	52.3	67.4	53.5	64.8	51.3
Norms: Permissible limit of Noise level - 75 dB (A) in day time & 70 dB (A) in night time													

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Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

Name & Address Of The Customer

To,
Jindal Power Limited
P.O. Tamnar,
District: Raigarh
496107 (C.G.)

REPORT NO	UES/TR/22-23/09452	
LAB REF NO	UES/22-23/FR/018011-018015	
DATE OF SAMPLING	06/01/2023	
DATE OF RECEIPT	07/01/2023	
DATE OF REPORT	11/01/2023	
DATE OF ANALYSIS	START:07/01/2023	END:11/01/2023

SAMPLE DETAILS

MONITORING FOR	Fugitive Emission Monitoring
CUSTOMER REF. NO. &DATE	4400016513, dated: 11.11.2022
SAMPLING LOCATION	Coal Crusher area DUH area Coal yard area Ash silo area (Stage-1) Ash silo area (Stage-2)
DURATION OF SAMPLING	8 HOURS
SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE
SAMPLE QUANTITY/PACKING	GMF FILTER PAPER (8 X 10 INCH): 1X1 NO.

TEST REPORT

Sr. No.	Parameter	Unit	Result					Method Reference
			Coal Crusher area	DUH area	Coal yard area	Ash silo area (Stage-1)	Ash silo area (Stage-2)	
1	Particulate Matter size less than 10 microns (PM_{10})	$\mu g/m^3$	82	84	88	78	86	IS 5182(Part 23):2006 & CPCB Guidelines Vol.-I

Note: All results are on the basis of 8 hour sampling.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

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- Test sample will be retained for 15days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only

For ULTIMATE ENVIROLYTICAL SOLUTIONS

11/01/23
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End of the test report

Jindal Power Limited, Tamnar

Annexure-4

GREEN BELT DEVELOPMENT

22-23		
Location	**No. of Saplings planted**	**Name of the main species**
Within the plant (Industrial canteen, Kelo vihar, near Gate No.2), Colony, Rabo dam area,Road side and in nearby villages	**96670**	Alostonia, Gulmohar, Chakundi, Neem, Mango, Teak , Peltophorm, Jamun, Amla etc.

Ultimate
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HDD-272, Phase III - Near JP Chowk
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099
Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

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Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Report No	UES/TR/22-23/09635	
	Lab Ref No	UES/22-23/W/018493-018494	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS

Customer Sample Id /Sampling Location	1. Piezometer - (Near Gate No. 03)	Latitude	22.13197
		Longitude	83.45947
	2. Piezometer - (SW near Ash Dyke S.V.2)	Latitude	22.11506
		Longitude	83.45075
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Sample Type	Ground Water		
Packing Of Sample	Plastic Bottle (3.0 ltr.*2), Glass Bottle (1.0 ltr.*2), PVC Can (1 ltr.*2)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

REPORT NO. 09635

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - Near Gate No. 03	Piezometer - SW Near Ash Dyke S.V.2
A.	Organoleptic & Physical Parameters						
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1.0	<1.0
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value at 25.4°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.26	7.58
4	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS 3025:(Part-10)	1	5	2.92	0.94
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	135.0	182.9
B.	General Parameters Concerning Substances undesirable in excessive amounts						
1	Aluminium (as Al)	mg/L	IS 3025(part-55)	0.03	0.2	BDL	BDL
2	Ammonia (as total ammonia-N)	mg/L	IS 3025(part-34)	0.5	No Relaxation	N.D.	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	BDL	BDL
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.	N.D.

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REPORT NO. 09635

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - Near Gate No. 03	Piezometer - SW Near Ash Dyke S.V.2
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.	N.D.
6	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	25.65	41.68
7	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.	N.D.
8	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	31.9	34.9
9	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	BDL	BDL
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.15	0.19
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	BDL	BDL
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	BDL	BDL
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	5.83	4.37
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	BDL	BDL
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	0.64	0.39
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	BDL	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	BDL	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	29.2	16.8
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	70.0	90.0
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	88.0	122.0
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	BDL	BDL
C.	Parameters concerning toxic substances:-						
1	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No	BDL	BDL

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REPORT NO. 09635

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - Near Gate No. 03	Piezometer - SW Near Ash Dyke S.V.2
					Relaxation		
2	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	BDL	BDL
3	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No Relaxation	BDL	BDL
4	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	No Relaxation	BDL	BDL
5	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.	N.D.
6	Nickel (as Ni)	mg/L	IS 3025(part-54)	0.02	No Relaxation	N.D.	N.D.
7	Polychlorinated biphenyls	mg/L	ASTM 5175	0.0005	No Relaxation	N.D.	N.D.
8	Polynuclear aromatic hydrocarbons (as PAH)	mg/L	APHA 6440	0.0001	No Relaxation	N.D.	N.D.
9	Arsenic (as As)	mg/L	IS 3025(part-37)	0.01	0.05	N.D.	N.D.
10	Chromium (as Cr)	mg/L	Annex J of IS:13428	0.05	No Relaxation	N.D.	N.D.
11	Trihalomethanes:						
a)	Bromoform	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
b)	Dibromochloromethane	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
c)	Bromodichloromethane	mg/L	APHA 6232	0.06	No Relaxation	N.D.	N.D.
d)	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.	N.D.
D.	Pesticides:-						
1	Alpha HCH	µg/l	USEPA 508	0.01		N.D.	N.D.
2	Beta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
3	Delta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
4	Alachlor	µg/l	USEPA 525.2, 507	20		N.D.	N.D.
5	Aldrin / Dieldrin	µg/l	USEPA 508	0.03		N.D.	N.D.
6	Atrazine	µg/l	USEPA 525.2,8141 A	2		N.D.	N.D.
7	Butachlor	µg/l	USEPA 525.2,8141 A	125		N.D.	N.D.
8	Chlorpyriphos	µg/l	USEPA 525.2,8141 A	30		N.D.	N.D.
9	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508	1		N.D.	N.D.
10	Gamma HCH	µg/l	USEPA 508	2		N.D.	N.D.

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REPORT NO. 09635

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - Near Gate No. 03	Piezometer - SW Near Ash Dyke S.V.2
11	2,4-Dichlorophenoxy acetic Acid	µg/l	USEPA 515.1	30		N.D.	N.D.
12	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508	0.4		N.D.	N.D.
13	Ethion	µg/l	USEPA 1657 A	3		N.D.	N.D.
14	Isoproturon	µg/l	USEPA 532	9		N.D.	N.D.
15	Malathion	µg/l	USEPA 8141 A	190		N.D.	N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A	0.3		N.D.	N.D.
17	Monocrotophos	µg/l	USEPA 8141 A	1		N.D.	N.D.
18	Phorate	µg/l	USEPA 8141 A	2		N.D.	N.D.
E.	Microbial Parameters						
1	Total Coliform	MPN/100ml	IS:1622:1981:RA:2019	-		Absent	Absent
2	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	-		Absent	Absent

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only.*

For ULTIMATE ENVIROLYTICAL SOLUTIONS

27/02/23

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End of the test report

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Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Report No	UES/TR/22-23/09636	
	Lab Ref No	UES/22-23/W/018495-018496	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS			
Customer Sample Id /Sampling Location	1. Piezometer - (Near ash Dyke Recovery Pond)	Latitude	22.11468
		Longitude	83.46731
	2. Piezometer -(Near ash Dyke village Pata village)	Latitude	22.13273
		Longitude	83.45694
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Sample Type	Ground Water		
Packing Of Sample	Plastic Bottle (3.0 ltr.*2), Glass Bottle (1.0 ltr.*2), PVC Can (1 ltr.*2)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

REPORT NO.05149

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (Near ash Dyke Recovery Pond)	Piezometer -(Near ash Dyke village pata village)
A.	Organoleptic & Physical Parameters						
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1.0	<1.0
2	Odour	-	IS:3025:(part-5)	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.64	7.18
4	Taste	-	IS:3025:(part-8)	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS:3025:(Part-10)	1	5	0.74	1.28
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	279	425
B.	General Parameters Concerning Substances undesirable in excessive amounts						
1	Aluminium (as Al)	mg/L	IS:3025:(part-55)	0.03	0.2	BDL	BDL
2	Ammonia (as total ammonia-N)	mg/L	IS:3025:(part-34)	0.5	No Relaxation	N.D.	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	N.D.	N.D.
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.	N.D.
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.	N.D.

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TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (Near ash Dyke Recovery Pond)	Piezometer -(Near ash Dyke village pata village)
6	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	44.89	52.10
7	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.	N.D.
8	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	64.2	115.1
9	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	BDL	BDL
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.19	0.18
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	BDL	BDL
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	BDL	BDL
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	18.47	15.55
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	BDL	BDL
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	0.41	0.65
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	BDL	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	BDL	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	21.4	23.0
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	146	186
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	188	194
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	BDL	BDL
C.	Parameters concerning toxic substances:-						
1	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	N.D.	N.D.
2	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	N.D.	N.D.
3	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No Relaxation	N.D.	N.D.
4	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	No Relaxation	N.D.	N.D.

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REPORT NO.05149

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (Near ash Dyke Recovery Pond)	Piezometer -(Near ash Dyke village pata village)
5	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.	N.D.
6	Nickel (as Ni)	mg/L	IS 3025(part-54)	0.02	No Relaxation	N.D.	N.D.
7	Polychlorinated biphenyls	mg/L	ASTM 5175	0.0005	No Relaxation	N.D.	N.D.
8	Polynuclear aromatic hydrocarbons (as PAH)	mg/L	APHA 6440	0.0001	No Relaxation	N.D.	N.D.
9	Arsenic (as As)	mg/L	IS 3025(part-37)	0.01	0.05	N.D.	N.D.
10	Chromium (as Cr)	mg/L	Annex J of IS:13428	0.05	No Relaxation	N.D.	N.D.
11	Trihalomethanes:						
a)	Bromoform	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
b)	Dibromochloromethane	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
c)	Bromodichloromethane	mg/L	APHA 6232	0.06	No Relaxation	N.D.	N.D.
d)	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.	N.D.
D.	Pesticides:-						
1	Alpha HCH	µg/l	USEPA 508	0.01		N.D.	N.D.
2	Beta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
3	Delta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
4	Alachlor	µg/l	USEPA 525.2, 507	20		N.D.	N.D.
5	Aldrin / Dieldrin	µg/l	USEPA 508	0.03		N.D.	N.D.
6	Atrazine	µg/l	USEPA 525.2,8141 A	2		N.D.	N.D.
7	Butachlor	µg/l	USEPA 525.2,8141 A	125		N.D.	N.D.
8	Chlorpyriphos	µg/l	USEPA 525.2,8141 A	30		N.D.	N.D.
9	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508	1		N.D.	N.D.
10	Gamma HCH	µg/l	USEPA 508	2		N.D.	N.D.
11	2,4-Dichlorophenoxyacetic Acid	µg/l	USEPA 515.1	30		N.D.	N.D.

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REPORT NO.05149

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (Near ash Dyke Recovery Pond)	Piezometer -(Near ash Dyke village pata village)
12	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508	0.4		N.D.	N.D.
13	Ethion	µg/l	USEPA 1657 A	3		N.D.	N.D.
14	Isoproturon	µg/l	USEPA 532	9		N.D.	N.D.
15	Malathion	µg/l	USEPA 8141 A	190		N.D.	N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A	0.3		N.D.	N.D.
17	Monocrotophos	µg/l	USEPA 8141 A	1		N.D.	N.D.
18	Phorate	µg/l	USEPA 8141 A	2		N.D.	N.D.
E.	Microbial Parameters						
1	Total Coliform	MPN/100ml	IS:1622:1981:RA:2019	-		Absent	Absent
2	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	-		Absent	Absent

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only.*

For ULTIMATE ENVIROLYTICAL SOLUTIONS

22/03/23

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----------End of the test report----------

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Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Report No	UES/TR/22-23/09637	
	Lab Ref No	UES/22-23/W/018496-018497	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS

Customer Sample Id /Sampling Location	1. Piezometer - (SE Near ash Dyke in front of SBI bank)	Latitude	22.11468
		Longitude	83.45507
	2. Piezometer - (Savitri Nagar Colony)	Latitude	22.11468
		Longitude	83.45507
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Sample Type	Ground Water		
Packing Of Sample	Plastic Bottle (3.0 ltr.*1), Glass Bottle (1.0 ltr.*1), PVC Can (1 ltr.*1)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

REPORT NO.09637

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (SE Near ash Dyke in front of SBI bank)	Piezometer - (Savitri Nagar Colony)
A.	Organoleptic & Physical Parameters						
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1	<1.0
2	Odour	-	IS:3025:(part-5)	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.32	6.72
4	Taste	-	IS:3025:(part-8)	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS:3025:(Part-10)	1	5	4.36	0.82
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	289	208
B.	General Parameters Concerning Substances undesirable in excessive amounts						
1	Aluminium (as Al)	mg/L	IS:3025:(part-55)	0.03	0.2	BDL	BDL
2	Ammonia (as total ammonia-N)	mg/L	IS:3025:(part-34)	0.5	No Relaxation	N.D.	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	N.D.	N.D.
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.	N.D.
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.	N.D.

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REPORT NO.09637

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (SE Near ash Dyke in front of SBI bank)	Piezometer - (Savitri Nagar Colony)
6	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	43.67	34.96
7	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.	N.D.
8	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	39.3	43.3
9	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	N.D.	BDL
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.19	0.20
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	N.D.	BDL
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	N.D.	BDL
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	20.18	12.34
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	N.D.	BDL
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	3.12	0.42
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	N.D.	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	N.D.	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	44.1	26.4
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	164.0	116
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	192.0	138
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	N.D.	BDL
C.	Parameters concerning toxic substances:-						
1	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	N.D.	N.D.
2	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	N.D.	N.D.
3	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No Relaxation	N.D.	N.D.
4	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	No Relaxation	N.D.	N.D.

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REPORT NO.09637

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (SE Near ash Dyke in front of SBI bank)	Piezometer - (Savitri Nagar Colony)
5	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.	N.D.
6	Nickel (as Ni)	mg/L	IS 3025(part-54)	0.02	No Relaxation	N.D.	N.D.
7	Polychlorinated biphenyls	mg/L	ASTM 5175	0.0005	No Relaxation	N.D.	N.D.
8	Polynuclear aromatic hydrocarbons (as PAH)	mg/L	APHA 6440	0.0001	No Relaxation	N.D.	N.D.
9	Arsenic (as As)	mg/L	IS 3025(part-37)	0.01	0.05	N.D.	N.D.
10	Chromium (as Cr)	mg/L	Annex J of IS:13428	0.05	No Relaxation	N.D.	N.D.
11	Trihalomethanes:						
a)	Bromoform	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
b)	Dibromochloromethane	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
c)	Bromodichloromethane	mg/L	APHA 6232	0.06	No Relaxation	N.D.	N.D.
d)	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.	N.D.
D.	Pesticides:-						
1	Alpha HCH	µg/l	USEPA 508	0.01		N.D.	N.D.
2	Beta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
3	Delta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
4	Alachlor	µg/l	USEPA 525.2, 507	20		N.D.	N.D.
5	Aldrin / Dieldrin	µg/l	USEPA 508	0.03		N.D.	N.D.
6	Atrazine	µg/l	USEPA 525.2,8141 A	2		N.D.	N.D.
7	Butachlor	µg/l	USEPA 525.2,8141 A	125		N.D.	N.D.
8	Chlorpyriphos	µg/l	USEPA 525.2,8141 A	30		N.D.	N.D.
9	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508	1		N.D.	N.D.
10	Gamma HCH	µg/l	USEPA 508	2		N.D.	N.D.
11	2,4-Dichlorophenoxyacetic Acid	µg/l	USEPA 515.1	30		N.D.	N.D.

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REPORT NO.09637

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (SE Near ash Dyke in front of SBI bank)	Piezometer - (Savitri Nagar Colony)
12	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508	0.4		N.D.	N.D.
13	Ethion	µg/l	USEPA 1657 A	3		N.D.	N.D.
14	Isoproturon	µg/l	USEPA 532	9		N.D.	N.D.
15	Malathion	µg/l	USEPA 8141 A	190		N.D.	N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A	0.3		N.D.	N.D.
17	Monocrotophos	µg/l	USEPA 8141 A	1		N.D.	N.D.
18	Phorate	µg/l	USEPA 8141 A	2		N.D.	N.D.
E.	Microbial Parameters						
1	Total Coliform	MPN/100ml	IS:1622:1981:RA: 2019	-		Absent	Absent
2	E. Coli	MPN/100ml	IS:1622:1981:RA: 2019	-		Absent	Absent

Note: mg/lit..milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only.*

For ULTIMATE ENVIROLYTICAL SOLUTIONS

24/02/23

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----------*End of the test report*----------

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Name & Address Of The Customer	Report No	UES/TR/22-23/09638	
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Lab Ref No	UES/22-23/W/018498	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS	
Customer Sample Id /Sampling Location	Piezometer - (CHP Out Side)
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022
Sample Type	Ground Water
Packing Of Sample	Plastic Bottle (3.0 ltr.*1), Glass Bottle (1.0 ltr.*1), PVC Can (1 ltr.*1)
Sample Collected By	Laboratory Chemist
Sample Condition At Receipt	Ok

REPORT NO.09638

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Piezometer - (CHP Out Side)
A.	Organoleptic & Physical Parameters					
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1.0
2	Odour	-	IS:3025:(part-5)	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.48
4	Taste	-	IS:3025:(part-8)	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS:3025:(Part-10)	1	5	0.96
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	185.1
B.	General Parameters Concerning Substances undesirable in excessive amounts					
1	Aluminium (as Al)	mg/L	IS:3025:(part-55)	0.03	0.2	BDL
2	Ammonia (as total ammonia-N)	mg/L	IS:3025:(part-34)	0.5	No Relaxation	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	N.D.
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.
6	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	32.06

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TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Flowmeter - (CHP Out Side)
7	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.
8	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	32.9
9	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	BDL
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.16
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	BDL
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	BDL
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	7.78
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	BDL
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	0.32
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	12.2
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	120.0
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	112.0
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	BDL
C.	Parameters concerning toxic substances:-					
1	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	N.D.
2	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	N.D.
3	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No Relaxation	N.D.
4	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	No Relaxation	N.D.
5	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.

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TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Piezometer - (CHP Out Side)
6	Nickel (as Ni)	mg/L	IS 3025(part-54)	0.02	No Relaxation	N.D.
7	Polychlorinated biphenyls	mg/L	ASTM 5175	0.0005	No Relaxation	N.D.
8	Polynuclear aromatic hydrocarbons (as PAH)	mg/L	APHA 6440	0.0001	No Relaxation	N.D.
9	Arsenic (as As)	mg/L	IS 3025(part-37)	0.01	0.05	N.D.
10	Chromium (as Cr)	mg/L	Annex J of IS:13428	0.05	No Relaxation	N.D.
11	Trihalomethanes:					
a)	Bromoform	mg/L	APHA 6232	0.1	No Relaxation	N.D.
b)	Dibromochloromethane	mg/L	APHA 6232	0.1	No Relaxation	N.D.
c)	Bromodichloromethane	mg/L	APHA 6232	0.06	No Relaxation	N.D.
d)	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.
D.	Pesticides:-					
1	Alpha HCH	µg/l	USEPA 508	0.01		N.D.
2	Beta HCH	µg/l	USEPA 508	0.04		N.D.
3	Delta HCH	µg/l	USEPA 508	0.04		N.D.
4	Alachlor	µg/l	USEPA 525.2, 507	20		N.D.
5	Aldrin / Dieldrin	µg/l	USEPA 508	0.03		N.D.
6	Atrazine	µg/l	USEPA 525.2,8141 A	2		N.D.
7	Butachlor	µg/l	USEPA 525.2,8141 A	125		N.D.
8	Chlorpyriphos	µg/l	USEPA 525.2,8141 A	30		N.D.
9	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508	1		N.D.
10	Gamma HCH	µg/l	USEPA 508	2		N.D.
11	2,4-Dichlorophenoxyacetic Acid	µg/l	USEPA 515.1	30		N.D.
12	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508	0.4		N.D.

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REPORT NO.09638

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Piezometer - (CHP Out Side)
13	Ethion	µg/l	USEPA 1657 A	3		N.D.
14	Isoproturon	µg/l	USEPA 532	9		N.D.
15	Malathion	µg/l	USEPA 8141 A	190		N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A	0.3		N.D.
17	Monocrotophos	µg/l	USEPA 8141 A	1		N.D.
18	Phorate	µg/l	USEPA 8141 A	2		N.D.
E.	Microbial Parameters					
1	Total Coliform	MPN/100ml	IS:1622:1981:RA: 2019	-		Absent
2	E. Coli	MPN/ 100ml	IS:1622:1981:RA: 2019	-		Absent

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

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- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only.*

22/02/23

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End of the test report

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Name & Address Of The Customer	Report No	UES/TR/22-23/09639	
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Lab Ref No	UES/22-23/W/018499-18500	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS			
Customer Sample Id /Sampling Location	1. Pata Village	Latitude	22.13781
		Longitude	83.46132
	2. Tamnar Village	Latitude	22.07879
		Longitude	83.42356
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Sample Type	Ground Water		
Packing Of Sample	Plastic Bottle (3.0 ltr.*3), Glass Bottle (1.0 ltr.*3), PVC Can (1 ltr.*3)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

REPORT NO. 09639

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Pata Village	Tamnar Village
A.	Organoleptic & Physical Parameters						
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1.0	<1.0
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.52	7.72
4	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS 3025:(Part-10)	1	5	0.84	1.59
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	254	286
B.	General Parameters Concerning Substances undesirable in excessive amounts						
1	Aluminium (as Al)	mg/L	IS 3025(part-55)	0.03	0.2	N.D.	N.D.
2	Ammonia (as total ammonia-N)	mg/L	IS 3025(part-34)	0.5	No Relaxation	N.D.	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	N.D.	N.D.
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.	N.D.
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.	N.D.

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REPORT NO. 09639

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Pata Village	Tamnar Village
6	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	31.05	39.28
7	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.	N.D.
8	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	35.2	34.9
9	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	N.D.	N.D.
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.12	0.16
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	N.D.	N.D.
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	BDL	BDL
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	22.48	6.32
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	N.D.	N.D.
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	0.30	0.34
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	BDL	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	BDL	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	40.0	24.4
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	146.0	110.0
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	170.0	124.0
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	N.D.	N.D.
C.	Parameters concerning toxic substances:-						
1	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	N.D.	N.D.
2	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	N.D.	N.D.
3	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No Relaxation	N.D.	N.D.
4	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	No Relaxation	N.D.	N.D.

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REPORT NO. 09639

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Pata Village	Tamnar Village
5	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.	N.D.
6	Nickel (as Ni)	mg/L	IS 3025(part-54)	0.02	No Relaxation	N.D.	N.D.
7	Polychlorinated biphenyls	mg/L	ASTM 5175	0.0005	No Relaxation	N.D.	N.D.
8	Polynuclear aromatic hydrocarbons (as PAH)	mg/L	APHA 6440	0.0001	No Relaxation	N.D.	N.D.
9	Arsenic (as As)	mg/L	IS 3025(part-37)	0.01	0.05	N.D.	N.D.
10	Chromium (as Cr)	mg/L	Annex J of IS:13428	0.05	No Relaxation	N.D.	N.D.
11	Trihalomethanes:						
a)	Bromoform	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
b)	Dibromochloromethane	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
c)	Bromodichloromethane	mg/L	APHA 6232	0.06	No Relaxation	N.D.	N.D.
d)	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.	N.D.
D.	Pesticides:-						
1	Alpha HCH	µg/l	USEPA 508	0.01		N.D.	N.D.
2	Beta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
3	Delta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
4	Alachlor	µg/l	USEPA 525.2, 507	20		N.D.	N.D.
5	Aldrin / Dieldrin	µg/l	USEPA 508	0.03		N.D.	N.D.
6	Atrazine	µg/l	USEPA 525.2,8141 A	2		N.D.	N.D.
7	Butachlor	µg/l	USEPA 525.2,8141 A	125		N.D.	N.D.
8	Chlorpyriphos	µg/l	USEPA 525.2,8141 A	30		N.D.	N.D.
9	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508	1		N.D.	N.D.
10	Gamma HCH	µg/l	USEPA 508	2		N.D.	N.D.
11	2,4-Dichlorophenoxyacetic Acid	µg/l	USEPA 515.1	30		N.D.	N.D.
12	Endosulphan (alpha, beta	µg/l	USEPA 508	0.4		N.D.	N.D.

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REPORT NO. 09639

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Pata Village	Tamnar Village
	and sulphate)						
13	Ethion	µg/l	USEPA 1657 A	3		N.D.	N.D.
14	Isoproturon	µg/l	USEPA 532	9		N.D.	N.D.
15	Malathion	µg/l	USEPA 8141 A	190		N.D.	N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A	0.3		N.D.	N.D.
17	Monocrotophos	µg/l	USEPA 8141 A	1		N.D.	N.D.
18	Phorate	µg/l	USEPA 8141 A	2		N.D.	N.D.
E.	Microbial Parameters						
1	Total Coliform	MPN/100ml	IS:1622:1981:RA :2019	-		Absent	Absent
2	E. Coli	MPN/100ml	IS:1622:1981:RA : 2019	-		Absent	Absent

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The above analysis report refers to the particular sample received at our end and the use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only.*

24/02/23

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AUTHORIZED SIGNATORY

End of the test report

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Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Report No	UES/TR/22-23/09640	
	Lab Ref No	UES/22-23/W/018501-018502	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS			
Customer Sample Id /Sampling Location	1. Kelo River Upstream 2. Kelo River Downstream	Latitude	22.69700
		Longitude	83.42118
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Sample Type	Surface Water		
Packing Of Sample	Plastic Bottle (3.0 ltr.*2), Glass Bottle (1.0 ltr.*2), PVC Can (1 ltr.*2)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

REPORT NO. 09640

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Kelo River Upstream	Kelo River Down stream
A.	Organoleptic & Physical Parameters						
1	Colour	Hazen	IS:3025:(Part-4)	5	15	20	15
2	Odour	-	IS:3025:(part-5)	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.36	7.80
4	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS 3025:(Part-10)	1	5	6.38	8.6
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	218	248
B.	General Parameters Concerning Substances undesirable in excessive amounts						
1	Aluminium (as Al)	mg/L	IS 3025(part-55)	0.03	0.2	BDL	BDL
2	Ammonia (as total ammonia-N)	mg/L	IS 3025(part-34)	0.5	No Relaxation	N.D.	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	BDL	BDL
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.	N.D.
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.	N.D.
6	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	19.63	25.65

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REPORT NO. 09640

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Kelo River Upstream	Kelo River Down stream
7	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.	N.D.
8	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	23.3	33.2
9	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	0.09	0.16
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.28	0.38
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	BDL	BDL
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	0.14	0.28
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	5.11	3.89
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	BDL	BDL
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	1.37	6.30
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	BDL	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	BDL	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	30.8	42.4
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	56.0	66.0
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	70.0	80.0
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	BDL	BDL
C.	Parameters concerning toxic substances:-						
1	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	BDL	BDL
2	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	BDL	BDL
3	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No Relaxation	BDL	BDL
4	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	No Relaxation	BDL	BDL

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REPORT NO. 09640

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Kelo River Upstream	Kelo River Down stream
5	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.	N.D.
6	Nickel (as Ni)	mg/L	IS 3025(part-54)	0.02	No Relaxation	N.D.	N.D.
7	Polychlorinated biphenyls	mg/L	ASTM 5175	0.0005	No Relaxation	N.D.	N.D.
8	Polynuclear aromatic hydrocarbons (as PAH)	mg/L	APHA 6440	0.0001	No Relaxation	N.D.	N.D.
9	Arsenic (as As)	mg/L	IS 3025(part-37)	0.01	0.05	BDL	BDL
10	Chromium (as Cr)	mg/L	Annex J of IS:13428	0.05	No Relaxation	BDL	BDL
11	Trihalomethanes:						
a)	Bromoform	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
b)	Dibromochloromethane	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
c)	Bromodichloromethane	mg/L	APHA 6232	0.06	No Relaxation	N.D.	N.D.
d)	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.	N.D.
D.	Pesticides:-						
1	Alpha HCH	µg/l	USEPA 508	0.01		N.D.	N.D.
2	Beta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
3	Delta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
4	Alachlor	µg/l	USEPA 525.2, 507	20		N.D.	N.D.
5	Aldrin / Dieldrin	µg/l	USEPA 508	0.03		N.D.	N.D.
6	Atrazine	µg/l	USEPA 525.2,8141 A	2		N.D.	N.D.
7	Butachlor	µg/l	USEPA 525.2,8141 A	125		N.D.	N.D.
8	Chlorpyriphos	µg/l	USEPA 525.2,8141 A	30		N.D.	N.D.
9	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508	1		N.D.	N.D.
10	Gamma HCH	µg/l	USEPA 508	2		N.D.	N.D.
11	2,4-Dichlorophenoxyacetic Acid	µg/l	USEPA 515.1	30		N.D.	N.D.

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REPORT NO. 09640

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Kelo River Upstream	Kelo River Down stream
12	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508	0.4		N.D.	N.D.
13	Ethion	µg/l	USEPA 1657 A	3		N.D.	N.D.
14	Isoproturon	µg/l	USEPA 532	9		N.D.	N.D.
15	Malathion	µg/l	USEPA 8141 A	190		N.D.	N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A	0.3		N.D.	N.D.
17	Monocrotophos	µg/l	USEPA 8141 A	1		N.D.	N.D.
18	Phorate	µg/l	USEPA 8141 A	2		N.D.	N.D.
E.	Microbial Parameters						
1	Total Coliform	MPN/ 100ml	IS:1622:1981:RA:2019	-		60	110
2	E. Coli	MPN/ 100ml	IS:1622:1981:RA:2019	-		22	60

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The above analysis report refers to the particular sample received at our end and the use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only.*

22/02/23

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AUTHORIZED SIGNATORY

End of the test report

Ultimate
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HDD-272, Phase III - Near JP Chowk
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To,
Jindal Power Limited
P.O. Tamnar,
District: Raigarh
496107 (C.G.)

Report No	UES/TR/22-23/05148
Lab Ref No	UES/22-23/W/011688-011689
Date of Sampling	23/11/2022
Date of Receipt	24/11/2022
Date of Report	28/11/2022
Date of analysis	Start: 24/11/2022 END: 28/11/2022

SAMPLE DETAILS

Customer Sample Id /Sampling Location	1. Piezometer – 01 (Near Gate No. 03)	Latitude	22 13197
		Longitude	83 45947
	2. Piezometer – 02 (SW near Ash Dyke S.V.2)	Latitude	22 11586
		Longitude	83 45075
Customer Ref. No. & Date	4400016513, DATED 11.11.2022		
Sample Type	Ground Water		
Packing Of Sample	Plastic Bottle (3.0 ltr *2), Glass Bottle (1.0 ltr *2), PVC Can (1 ltr *2)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	OK		

REPORT NO. 05148

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer 01	Piezometer 02
A.	**Organoleptic & Physical Parameters**						
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1.0	<1.0
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value at 25.4°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.23	7.54
4	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS 3025:(Part-10)	1	5	2.88	0.92
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	132	179.6
B.	**General Parameters Concerning Substances undesirable in excessive amounts**						
1	Aluminium (as Al)	mg/L	IS 3025(part-55)	0.03	0.2	BDL	BDL
2	Ammonia (as total ammonia-N)	mg/L	IS 3025(part-34)	0.5	No Relaxation	N.D.	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	BDL	BDL
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.	N.D.
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.	N.D.

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REPORT NO. 05148

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer 01	Piezometer 02
5	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	30.46	39.27
7	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.	N.D.
8	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	28.9	30.9
9	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	BDL	BDL
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.12	0.17
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	BDL	BDL
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	BDL	BDL
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	7.8	8.96
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	BDL	BDL
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	0.59	0.34
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	BDL	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	BDL	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	26.8	14.6
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	66	86
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	84	114
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	BDL	BDL
	Parameters concerning toxic substances:-						
25	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	BDL	BDL
26	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	BDL	BDL
27	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No	BDL	BDL

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REPORT NO. 05148

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer 01	Piezometer 02
4	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	Relaxation No Relaxation	BDL	BDL
5	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.	N.D.
6	Nickel (as Ni)	mg/L	IS 3025(part-54)	0.02	No Relaxation	N.D.	N.D.
7	Polychlorinated biphenyls	mg/L	ASTM 5175	0.0005	No Relaxation	N.D.	N.D.
8	Polynuclear aromatic hydrocarbons (as PAH)	mg/L	APHA 6440	0.0001	No Relaxation	N.D.	N.D.
9	Arsenic (as As)	mg/L	IS 3025(part-37)	0.01	0.05	N.D.	N.D.
10	Chromium (as Cr)	mg/L	Annex J of IS:13428	0.05	No Relaxation	N.D.	N.D.
11	Trihalomethanes:						
a)	Bromoform	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
b)	Dibromochlorome thane	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
c)	Bromodichlorome thane	mg/L	APHA 6232	0.06	No Relaxation	N.D.	N.D.
d)	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.	N.D.
D.	Pesticides:-						
1	Alpha HCH	µg/l	USEPA 508	0.01		N.D.	N.D.
2	Beta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
3	Delta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
4	Alachlor	µg/l	USEPA 525.2, 507	20		N.D.	N.D.
5	Aldrin / Dieldrin	µg/l	USEPA 508	0.03		N.D.	N.D.
6	Atrazine	µg/l	USEPA 525.2,8141 A	2		N.D.	N.D.
7	Butachlor	µg/l	USEPA 525.2,8141 A	125		N.D.	N.D.
8	Chlorpyriphos	µg/l	USEPA 525.2,8141 A	30		N.D.	N.D.
9	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508	1		N.D.	N.D.
10	Gamma HCH	µg/l	USEPA 508	2		N.D.	N.D.
11	2,4-Dichlorophenoxy acetic Acid	µg/l	USEPA 515.1	30		N.D.	N.D.
12	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508	0.4		N.D.	N.D.

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REPORT NO. 05148

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer 01	Piezometer 02
	Ethion				3	N D	N D
	Isoproturon				9	N D	N D
	Malathion				190	N D	N D
	Methyl Parathion				03	N D	N D
	Monocrotophos				1	N D	N D
	Phorate				2	N D	N D
E	Microbial Parameters						
	Total Coliform	MPN/100ml	IS 1622:1981(RA 2019)	-		Absent	Absent
	E Coli	MPN/100ml	IS 1622:1981(RA 2019)	-		Absent	Absent

Note: mg/lit. milligram per liter, N.D. Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issuing of the report unless otherwise agreed with customer.*
- *This is for information as the party has asked [illegible] only.*

For ULTIMATE ENVIROLYTICAL SOLUTIONS

28/11/2022

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End of the test report

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To,
Jindal Power Limited
P.O. Tamnar,
District: Raigarh
496107 (C.G.)

Report No	UES/TR/22-23/05149
Lab Ref No	UES/22-23/W/011690-011691
Date of Sampling	23/11/2022
Date of Receipt	24/11/2022
Date of Report	28/11/2022
Date of analysis	Start 24/11/2022 End 28/11/2022

SAMPLE DETAILS

Customer Sample Id / Sampling Location	1. Piezometer (Near ash Dyke Recovery Pond)	Latitude	22 [illegible]
		Longitude	81 [illegible]
	2. Piezometer (Near ash Dyke village pata village)	Latitude	22 [illegible]
		Longitude	81 [illegible]
Customer Ref. No. & Date	4600016519 DATED: 11.11.2022		
Sample Type	Ground Water		
Packing Of Sample	Plastic Bottle (3.0 ltr. *2), Glass Bottle (1.0 ltr. *2), PVC Can (1 ltr. *2)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	OK		

REPORT NO.05149

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (Near ash Dyke Recovery Pond)	Piezometer -(Near ash Dyke village pata village)
A.	**Organoleptic & Physical Parameters**						
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1.0	<1.0
2	Odour	-	IS:3025:(part-5)	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.62	7.16
4	Taste	-	IS:3025:(part-8)	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS:3025:(Part-10)	1	5	0.72	1.26
6	Total Dissolved Solids	mg/l	IS:3025:(Part-16)	500	2000	276	422
B.	**General Parameters Concerning Substances undesirable in excessive amounts**						
1	Aluminium (as Al)	mg/l	IS:3025:(part-55)	0.03	0.2	BDL	BDL
2	Ammonia (as total ammonia-N)	mg/l	IS:3025:(part-34)	0.5	No Relaxation	N.D.	N.D.
3	Anionic Detergent (as MBAS)	mg/l	Annex F of IS:13428	0.2	1.0	N.D.	N.D.
4	Barium (as Ba)	mg/l	Annex F of IS:13428	0.7	No Relaxation	N.D.	N.D.
5	Boron (as B)	mg/l	IS:3025:(Part-57)	0.5	1.0	N.D.	N.D.

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TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit		
	Calcium (as Ca)			75	200	37.27	49.69
	Chloramines (as Cl_2)			4.0	No Relaxation	N.D	N.D
	Chloride (as Cl)			250	1000	60.9	112.9
	Copper (as Cu)			0.05	1.5	BDL	BDL
	Fluoride (as F)			1	1.5	0.16	0.14
	Free Residual Chlorine			0.2	1	BDL	BDL
	Iron (as Fe)			0.3	No Relaxation	BDL	BDL
	Magnesium (as Mg)			30	100	9.2	12.15
	Manganese (as Mn)			0.1	0.3	BDL	BDL
	Mineral Oil			0.5	No Relaxation	N.D	N.D
	Nitrate (as NO_3)			45	No Relaxation	0.37	0.59
	Phenolic Compound (as C_6H_5ON)			0.001	0.002	BDL	BDL
	Selenium (as Se)			0.01	No Relaxation	BDL	BDL
	Silver (as Ag)			0.1	No Relaxation	N.D	N.D
	Sulphate (as SO_4)			200	400	19.2	20.8
	Sulphide (as H_2S)			0.05	No Relaxation	N.D	N.D
	Total Alkalinity (as $CaCO_3$)			200	600	142	184
	Total Hardness (as $CaCO_3$)			200	600	184	196
	Zinc (as Zn)			5	15	BDL	BDL
C.	**Parameters concerning toxic substances :-**						
	Cadmium (as Cd)			0.003	No Relaxation	N.D	N.D
	Cyanide (as CN)			0.05	No Relaxation	N.D	N.D
	Lead (as Pb)			0.01	No Relaxation	N.D	N.D
	Mercury (as Hg)			0.001	No Relaxation	N.D	N.D

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REPORT NO.05149

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (Near ash Dyke Recovery Pond)	Piezometer -(Near ash Dyke village pata village)
5	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.	N.D.
6	Nickel (as Ni)	mg/L	IS 3025(part-54)	0.02	No Relaxation	N.D.	N.D.
7	Polychlorinated biphenyls	mg/L	ASTM 5175	0.0005	No Relaxation	N.D.	N.D.
8	Polynuclear aromatic hydrocarbons (as PAH)	mg/L	APHA 6440	0.0001	No Relaxation	N.D.	N.D.
9	Arsenic (as As)	mg/L	IS 3025(part-37)	0.01	0.05	N.D.	N.D.
10	Chromium (as Cr)	mg/L	Annex J of IS:13428	0.05	No Relaxation	N.D.	N.D.
11	Trihalomethanes:						
a)	Bromoform	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
b)	Dibromochloromethane	mg/L	APHA 6232	0.1	No Relaxation	N.D.	N.D.
c)	Bromodichloromethane	mg/L	APHA 6232	0.06	No Relaxation	N.D.	N.D.
d)	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.	N.D.
D.	Pesticides:-						
1	Alpha HCH	µg/l	USEPA 508	0.01		N.D.	N.D.
2	Beta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
3	Delta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
4	Alachlor	µg/l	USEPA 525.2, 507	20		N.D.	N.D.
5	Aldrin / Dieldrin	µg/l	USEPA 508	0.03		N.D.	N.D.
6	Atrazine	µg/l	USEPA 525.2,8141 A	2		N.D.	N.D.
7	Butachlor	µg/l	USEPA 525.2,8141 A	125		N.D.	N.D.
8	Chlorpyriphos	µg/l	USEPA 525.2,8141 A	30		N.D.	N.D.
9	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508	1		N.D.	N.D.
10	Gamma HCH	µg/l	USEPA 508	2		N.D.	N.D.
11	2,4-Dichlorophenoxyacetic Acid	µg/l	USEPA 515.1	30		N.D.	N.D.

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REPORT NO.05149

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Piezometer - (Near ash Dyke Recovery Pond)	Piezometer -(Near ash Dyke village pata village)
12	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508	0.4		N.D.	N.D.
13	Ethion	µg/l	USEPA 1657 A	3		N.D.	N.D.
14	Isoproturon	µg/l	USEPA 532	9		N.D.	N.D.
15	Malathion	µg/l	USEPA 8141 A	190		N.D.	N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A	0.3		N.D.	N.D.
17	Monocrotophos	µg/l	USEPA 8141 A	1		N.D.	N.D.
18	Phorate	µg/l	USEPA 8141 A	2		N.D.	N.D.
E.	Microbial Parameters						
1	Total Coliform	MPN/100ml	IS:1622:1981:RA:2019	-		Absent	Absent
2	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	-		Absent	Absent

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above tests only.*

For ULTIMATE ENVIROLYTICAL SOLUTIONS

28/11/2024

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AUTHORIZED SIGNATORY

----------End of the test report----------

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Name & Address Of The Customer

To,
Jindal Power Limited
P.O. Tamnar,
District: Raigarh
496107 (C.G.)

Report No	UES/TR/22-23/05150
Lab Ref No	UES/22-23/W/011692-011694
Date of Sampling	23/11/2022
Date of Receipt	24/11/2022
Date of Report	28/11/2022
Date of analysis	Start: 24/11/2022 End: 28/11/2022

SAMPLE DETAILS

Customer Sample Id /Sampling Location	1. Pata Village	Latitude	22.13761
		Longitude	83.46132
	2. Piezometer Inside Plant	Latitude	22.10948
		Longitude	83.45670
	3. Tamnar Village	Latitude	22.07879
		Longitude	83.42356
Customer Ref. No & Date	4400016513, DATED: 11.11.2022		
Sample Type	Ground Water		
Packing Of Sample	Plastic Bottle (3.0 ltr.*3), Glass Bottle (1.0 ltr.*3), PVC Can (1 ltr.*3)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	OK		

REPORT NO. 05150

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT		
				Acceptable Limit	Permissible limit	Pata Village	JPL Ash Brick Plant	Tamnar Village
A.	Organoleptic & Physical Parameters							
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1.0	<1	<1.0
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.49	7.24	7.69
4	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS 3025:(Part-10)	1	5	0.82	1.18	1.57
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	250	198	280
B.	General Parameters Concerning Substances undesirable in excessive amounts							
1	Aluminium (as Al)	mg/L	IS 3025(part-55)	0.03	0.2	N.D.	N.D.	N.D.
2	Ammonia (as total ammonia-N)	mg/L	IS 3025(part-34)	0.5	No Relaxation	N.D.	N.D.	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	N.D.	N.D.	N.D.
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No	N.D.	N.D.	N.D.

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REPORT NO. 05150

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT		
				Acceptable Limit	Permissible limit	Pata Village	JPL Ash Brick Plant	Tamnar Village
					Relaxation			
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.	N.D.	N.D.
6	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	28.85	21.24	40.88
7	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.	N.D.	N.D.
8	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	31.9	14.9	32.9
9	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	N.D.	N.D.	N.D.
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.10	0.12	0.14
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	N.D.	N.D.	N.D.
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	BDL	0.08	BDL
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	7.29	16.67	9.72
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	N.D.	N.D.	N.D.
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.	N.D.	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	0.29	0.30	0.31
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	BDL	BDL	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	BDL	BDL	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.	N.D.	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	38.0	27.6	22.20
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.	N.D.	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	144	118	92
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	168	184	108
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	N.D.	N.D.	N.D.
C.	Parameters concerning toxic substances:-							
1	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	N.D.	N.D.	N.D.
2	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	N.D.	N.D.	N.D.

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REPORT NO. [illegible]

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT		
				Acceptable Limit	Permissible limit	Pale Village	JPL Ash Brick Plant	Tanmar Village
	Lead (as Pb)	[illegible]	[illegible]	0.01	No Relaxation	N.D.	N.D.	N.D.
	Mercury (as Hg)	[illegible]	[illegible]	0.001	No Relaxation	N.D.	N.D.	N.D.
	Molybdenum (as Mo)	[illegible]	[illegible]	0.07	No Relaxation	N.D.	N.D.	N.D.
	Nickel (as Ni)	[illegible]	[illegible]	0.02	No Relaxation	N.D.	N.D.	N.D.
	Polychlorinated biphenyls	[illegible]	[illegible]	0.0005	No Relaxation	N.D.	N.D.	N.D.
	Polynuclear aromatic hydrocarbons (as PAH)	[illegible]	[illegible]	0.0001	No Relaxation	N.D.	N.D.	N.D.
	Arsenic (as As)	[illegible]	[illegible]	0.01	0.05	N.D.	N.D.	N.D.
	Chromium (as Cr)	[illegible]	[illegible]	0.05	No Relaxation	N.D.	N.D.	N.D.
	Trihalomethanes							
	Bromoform	[illegible]	[illegible]	0.1	No Relaxation	N.D.	N.D.	N.D.
	Dibromochloromethane	[illegible]	[illegible]	0.1	No Relaxation	N.D.	N.D.	N.D.
	Bromodichloromethane	[illegible]	[illegible]	0.06	No Relaxation	N.D.	N.D.	N.D.
	Chloroform	[illegible]	[illegible]	0.2	No Relaxation	N.D.	N.D.	N.D.
D.	Pesticides :-							
	Alpha HCH	[illegible]	[illegible]		0.01	N.D.	N.D.	N.D.
	Beta HCH	[illegible]	[illegible]		0.04	N.D.	N.D.	N.D.
	Delta HCH	[illegible]	[illegible]		0.04	N.D.	N.D.	N.D.
	Alachlor	[illegible]	[illegible]		20	N.D.	N.D.	N.D.
	Aldrin / Dieldrin	[illegible]	[illegible]		0.03	N.D.	N.D.	N.D.
	Atrazine	[illegible]	[illegible]		2	N.D.	N.D.	N.D.
	Butachlor	[illegible]	[illegible]		125	N.D.	N.D.	N.D.
	Chlorpyriphos	[illegible]	[illegible]		30	N.D.	N.D.	N.D.
	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	[illegible]	[illegible]		1	N.D.	N.D.	N.D.
10	Gamma HCH	[illegible]	[illegible]		2	N.D.	N.D.	N.D.

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REPORT NO. 05150

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT		
				Acceptable Limit	Permissible limit	Pata Village	JPL Ash Brick Plant	Tamnar Village
11	2,4-Dichlorophenoxyacetic Acid	µg/l	USEPA 515.1		30	N.D.	N.D.	N.D.
12	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508		0.4	N.D.	N.D.	N.D.
13	Ethion	µg/l	USEPA 1657 A		3	N.D.	N.D.	N.D.
14	Isoproturon	µg/l	USEPA 532		9	N.D.	N.D.	N.D.
15	Malathion	µg/l	USEPA 8141 A		190	N.D.	N.D.	N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A		0.3	N.D.	N.D.	N.D.
17	Monocrotophos	µg/l	USEPA 8141 A		1	N.D.	N.D.	N.D.
18	Phorate	µg/l	USEPA 8141 A		2	N.D.	N.D.	N.D.
E.	Microbial Parameters							
1	Total Coliform	MPN/100ml	IS:1622:1981:RA :2019		-	Absent	Absent	Absent
2	E. Coli	MPN/100ml	IS:1622:1981:RA : 2019		-	Absent	Absent	Absent

Note: mg/lit.: milligram per liter, N.D.: Not Detected

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The above analysis report refers to the particular sample received at our end and the use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only.*

28/1/2022

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ULTIMATE ENVIROLYTICAL SOLUTIONS, HDD-272, Phase-3, Kabir Nagar, Raipur (C.G.) 492001

For ULTIMATE ENVIROLYTICAL SOLUTIONS

AUTHORIZED SIGNATORY

End of the test report

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Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Report No	UES/TR/22-23/05151	
	Lab Ref No	UES/22-23/W/011695-011696	
	Date of Sampling	23/11/2022	
	Date of Receipt	24/11/2022	
	Date of Report	28/11/2022	
	Date of analysis	Start: 24/11/2022	End: 28/11/2022

SAMPLE DETAILS

Customer Sample Id /Sampling Location	1. Kelo River Upstream 2. Kelo River Downstream	Latitude	22.69700
		Longitude	83.42118
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Sample Type	Surface Water		
Packing Of Sample	Plastic Bottle (3.0 ltr *2), Glass Bottle (1.0 ltr *2), PVC Can (1 ltr *2)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

REPORT NO. 05151

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Kelo River Upstream	Kelo River Down stream
A.	**Organoleptic & Physical Parameters**						
1	Colour	Hazen	IS:3025:(Part-4)	5	15	25	20
2	Odour	-	IS:3025:(part-5)	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.33	7.78
4	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS 3025:(Part-10)	1	5	6.35	8.4
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	210	240
B.	**General Parameters Concerning Substances undesirable in excessive amounts**						
1	Aluminium (as Al)	mg/L	IS 3025(part-55)	0.03	0.2	BDL	BDL
2	Ammonia (as total ammonia-N)	mg/L	IS 3025(part-34)	0.5	No Relaxation	N.D.	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	BDL	BDL
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.	N.D.
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.	N.D.
6	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	15.23	35.27

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REPORT NO. 05151

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Kelo River Upstream	Kelo River Down stream
7	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.	N.D.
8	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	18.9	29.9
9	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	0.07	0.14
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.26	0.35
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	BDL	BDL
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	0.12	0.26
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	3.8	9.2
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	BDL	BDL
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	1.28	5.98
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	BDL	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	BDL	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	28.6	40.2
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	40	52
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	66	76
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	BDL	BDL
	Parameters concerning toxic substances:-						
	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	BDL	BDL
	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	BDL	BDL
	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No Relaxation	BDL	BDL
	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	No Relaxation	BDL	BDL

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REPORT NO. 05151

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Kelo River Upstream	Kelo River Down stream
	Molybdenum (as Mo)	mg/l	[illegible]	0.07	No Relaxation	N.D.	N.D.
	Nickel (as Ni)	mg/l	IS 3025(part-54)	0.02	No Relaxation	N.D.	N.D.
	Polychlorinated biphenyls	mg/l	ASTM [illegible]	0.0005	No Relaxation	N.D.	N.D.
	Polynuclear aromatic hydrocarbons (as PAH)	mg/l	APHA 6440	0.0001	No Relaxation	N.D.	N.D.
	Arsenic (as As)	mg/l	IS 3025(part-37)	0.01	0.05	BDL	BDL
	Chromium (as Cr)	mg/l	Annex J of IS:13428	0.05	No Relaxation	BDL	BDL
C.	Trihalomethanes						
	Bromoform	mg/l	APHA 6232	0.1	No Relaxation	N.D.	N.D.
	Dibromochloromethane	mg/l	APHA 6232	0.1	No Relaxation	N.D.	N.D.
	Bromodichloromethane	mg/l	APHA 6232	0.06	No Relaxation	N.D.	N.D.
	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.	N.D.
D.	**Pesticides:-**						
	Alpha HCH	µg/l	USEPA 508	0.01		N.D.	N.D.
	Beta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
	Delta HCH	µg/l	USEPA 508	0.04		N.D.	N.D.
	Alachlor	µg/l	USEPA 525.2, 507	20		N.D.	N.D.
	Aldrin / Dieldrin	µg/l	USEPA 508	0.03		N.D.	N.D.
	Atrazine	µg/l	USEPA 525.2,8141 A	2		N.D.	N.D.
	Butachlor	µg/l	USEPA 525.2,8141 A	125		N.D.	N.D.
	Chlorpyriphos	µg/l	USEPA 525.2,8141 A	30		N.D.	N.D.
	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508	1		N.D.	N.D.
	Gamma HCH	µg/l	USEPA 508	2		N.D.	N.D.
	2,4-Dichlorophenoxyacetic Acid	µg/l	USEPA 515.1	30		N.D.	N.D.

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TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT	
				Acceptable Limit	Permissible limit	Kelo River Upstream	Kelo River Down stream
12	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508	0.4		N.D.	N.D.
13	Ethion	µg/l	USEPA 1657 A	3		N.D.	N.D.
14	Isoproturon	µg/l	USEPA 532	9		N.D.	N.D.
15	Malathion	µg/l	USEPA 8141 A	190		N.D.	N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A	0.3		N.D.	N.D.
17	Monocrotophos	µg/l	USEPA 8141 A	1		N.D.	N.D.
18	Phorate	µg/l	USEPA 8141 A	2		N.D.	N.D.
E.	Microbial Parameters						
1	Total Coliform	MPN/ 100ml	IS:1622:1981:RA:2019	-		70	130
2	E. Coli	MPN/ 100ml	IS:1622:1981:RA:2019	-		26	80

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The above analysis report refers to the particular sample received at our end and the use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of report unless otherwise agreed with customer.*
- *This is for information as the party has asked for [illegible] only.*

28/11/2022

REVIEWED BY

ULTIMATE ENVIROLYTICAL SOLUTIONS HDD-272, Phase-3, Ring Road No.-2, Raipur (C.G.) 492001

For **ULTIMATE ENVIROLYTICAL SOLUTIONS**

AUTHORIZED SIGNATORY

----------*End of the test report*----------

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To,
Jindal Power Limited
P.O. Tamnar,
District: Raigarh
496107 (C.G.)

Report No	UES/TR/22-23/05154
Lab Ref No	UES/22-23/W/011701
Date of Sampling	23/11/2022
Date of Receipt	24/11/2022
Date of Report	28/11/2022
Date of analysis	Start: 24/11/2022 End: 28/11/2022

SAMPLE DETAILS

Customer Sample Id / Sampling Location	1 Piezometer - (SE Near ash Dyke in front of SBI bank)	Latitude	22.11468
		Longitude	83.45507
Customer Ref. No. & Date	4400016513 DATED 11.11.2022		
Sample Type	Ground Water		
Packing Of Sample	Plastic Bottle (3.0 ltr *1), Glass Bottle (1.0 ltr *1), PVC Can (1 ltr *1)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

REPORT NO.05154

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Piezometer - (SE Near ash Dyke in front of SBI bank)
A.	**Organoleptic & Physical Parameters**					
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS:3025:(part-5)	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	7.28
4	Taste	-	IS:3025:(part-8)	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS:3025:(Part-10)	1	5	4.33
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	286
B.	**General Parameters Concerning Substances undesirable in excessive amounts**					
1	Aluminium (as Al)	mg/L	IS:3025:(part-55)	0.03	0.2	N.D.
2	Ammonia (as total ammonia-N)	mg/L	IS:3025:(part-34)	0.5	No Relaxation	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	N.D.
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.
5	Boron (as B)	mg/L	IS:3025:(Part-57)	0.5	1.0	N.D.
6	Calcium (as Ca)	mg/L	IS:3025:(Part-40)	75	200	39.67
7	Chloramines (as Cl_2)	mg/L	IS:3025:(Part-26)	4.0	No Relaxation	N.D.

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REPORT NO.251154

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible Limit	Piezometer - (02 Near ash Dyke in front of SBI bank)
	Chloride (as Cl)	mg/L	IS 3025(part-32)	250	1000	34.9
	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	N.D.
	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.17
	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	N.D.
	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	N.D.
	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	26.0
	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	N.D.
	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.
	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	2.97
	Phenolic Compound (as C_6H_5OH)	mg/L	IS 3025(part-43)	0.001	0.002	N.D.
	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	N.D.
	Silver (as Ag)	mg/L	Annex J of IS: 13428	0.1	No Relaxation	N.D.
	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	41.9
	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.
	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	170.0
	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	198.0
	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	IS	N.D.
C.	**Parameters concerning toxic substances:-**					
	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	N.D.
	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	N.D.
	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No Relaxation	N.D.
	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	No Relaxation	N.D.
	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.
	Nickel (as Ni)	mg/L	IS 3025(part-54)	0.02	No Relaxation	N.D.

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REPORT NO.05154

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Flowmeter - (IE Near ash Dyke in front of SBI bank)
	Polychlorinated biphenyls	mg/L	APHA [illegible]	0.0005	No Relaxation	N.D.
	Polynuclear aromatic hydrocarbons (as PAH)	mg/L	APHA [illegible]	0.0001	No Relaxation	N.D.
	Arsenic (as As)	mg/L	[illegible]	0.01	0.05	N.D.
	Chromium (as Cr)	mg/L	[illegible]	0.05	No Relaxation	N.D.
	Trihalomethanes:					
	Bromoform	mg/L	APHA 6232	0.1	No Relaxation	N.D.
	Dibromochloromethane	mg/L	APHA 6232	0.1	No Relaxation	N.D.
	Bromodichloromethane	mg/L	APHA 6232	0.06	No Relaxation	N.D.
	Chloroform	mg/L	APHA 6232	0.2	No Relaxation	N.D.
D	Pesticides:-					
	Alpha HCH	µg/l	USEPA 508		0.01	N.D.
	Beta HCH	µg/l	USEPA 508		0.04	N.D.
	Delta HCH	µg/l	USEPA 508		0.04	N.D.
	Alachlor	µg/l	USEPA 525.2; 507		20	N.D.
	Aldrin / Dieldrin	µg/l	USEPA 508		0.03	N.D.
	Atrazine	µg/l	USEPA 525.2,8141 A		2	N.D.
	Butachlor	µg/l	USEPA 525.2,8141 A		125	N.D.
	Chlorpyriphos	µg/l	USEPA 525.2,8141 A		30	N.D.
	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)	µg/l	USEPA 508		1	N.D.
	Gamma HCH	µg/l	USEPA 508		2	N.D.
	2,4-Dichlorophenoxyacetic Acid	µg/l	USEPA 515.1		30	N.D.
	Endosulphan (alpha, beta and sulphate)	µg/l	USEPA 508		0.4	N.D.
	Ethion	µg/l	USEPA [illegible] A		3	N.D.

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REPORT NO.05154

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Piezometer - (SE Near ash Dyke in front of SBI bank)
14	Isoproturon	µg/l	USEPA 532	9		N.D.
15	Malathion	µg/l	USEPA 8141 A	190		N.D.
16	Methyl Parathion	µg/l	USEPA 8141 A	0.3		N.D.
17	Monocrotophos	µg/l	USEPA 8141 A	1		N.D.
18	Phorate	µg/l	USEPA 8141 A	2		N.D.
E.	Microbial Parameters					
1	Total Coliform	MPN/100ml	IS:1622:1981:RA: 2019	-		Absent
2	E. Coli	MPN/ 100ml	IS:1622:1981:RA: 2019	-		Absent

Note: mg/lt.:milligram per liter, N.D.: Not Detected

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The use of the report for publication, arbitration or any legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of this report unless otherwise agreed with customer.*
- *This is for information as the party has asked for analysis only.*

28/11/2022

REVIEWED BY

For **ULTIMATE ENVIROLYTICAL SOLUTIONS**

AUTHORIZED SIGNATORY

----------*End of the test report*----------

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To, Jindal Power Limited P.O. Tamnar, District: Raigarh 496107 (C.G.)	Report No	UES/TR/22-23/05159	
	Lab Ref No	UES/22-23/W/011706	
	Date of Sampling	23/11/2022	
	Date of Receipt	24/11/2022	
	Date of Report	28/11/2022	
	Date of analysis	Start: 24/11/2022	End: 28/11/2022

SAMPLE DETAILS

Customer Sample Id /Sampling Location	1. Piezometer - (Savitri Nagar Colony)	Latitude	22.11468
		Longitude	83.45507
Customer Ref No. & Date	4400016513, DATED: 11.11.2022		
Sample Type	Ground Water		
Packing Of Sample	Plastic Bottle (3.0 ltr *1), Glass Bottle (1.0 ltr *1), PVC Can (1 ltr *1)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

REPORT NO.05159

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Piezometer - (Savitri Nagar Colony)
A.	**Organoleptic & Physical Parameters**					
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1.0
2	Odour	-	IS:3025:(part-5)	Agreeable	Agreeable	Agreeable
3	pH Value at 25.2°C	-	IS:3025:(Part-11)	6.5-8.5	No Relaxation	6.68
4	Taste	-	IS:3025:(part-8)	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	IS:3025:(Part-10)	1	5	0.78
6	Total Dissolved Solids	mg/L	IS:3025:(Part-16)	500	2000	204
B.	**General Parameters Concerning Substances undesirable in excessive amounts**					
1	Aluminium (as Al)	mg/L	IS:3025:(part-55)	0.03	0.2	BDL
2	Ammonia (as total ammonia-N)	mg/L	IS:3025:(part-34)	0.5	No Relaxation	N.D.
3	Anionic Detergent (as MBAS)	mg/L	Annex K of IS:13428	0.2	1.0	N.D.
4	Barium (as Ba)	mg/L	Annex F of IS:13428	0.7	No Relaxation	N.D.
5	Boron (as B)	mg/L	IS 3025:(Part-57)	0.5	1.0	N.D.
6	Calcium (as Ca)	mg/L	IS 3025:(Part-40)	75	200	31.66

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REPORT NO.05159

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Piezometer - (Savitri Nagar Colony)
-	Chloramines (as Cl_2)	mg/L	IS 3025:(Part-26)	4.0	No Relaxation	N.D.
4	Chloride (as Cl)	mg/L	IS 3025:(Part-32)	250	1000	38.9
8	Copper (as Cu)	mg/L	IS 3025(part-42)	0.05	1.5	BDL
10	Fluoride (as F)	mg/L	IS 3025(part-60)	1	1.5	0.17
11	Free Residual Chlorine	mg/L	IS 3025:(Part-26)	0.2	1	BDL
12	Iron (as Fe)	mg/L	IS 3025(part-53)	0.3	No Relaxation	BDL
13	Magnesium (as Mg)	mg/L	IS 3025:(Part-46)	30	100	7.77
14	Manganese (as Mn)	mg/L	IS 3025(part-59)	0.1	0.3	BDL
15	Mineral Oil	mg/L	Clause 6 of IS 3025 (Part-39) Infrared partition method	0.5	No Relaxation	N.D.
16	Nitrate (as NO_3)	mg/L	IS 3025(part-34)	45	No Relaxation	0.38
17	Phenolic Compound (as C6H5OH)	mg/L	IS 3025(part-43)	0.001	0.002	BDL
18	Selenium (as Se)	mg/L	IS 3025(part-56)	0.01	No Relaxation	BDL
19	Silver (as Ag)	mg/L	Annex J of IS 13428	0.1	No Relaxation	N.D.
20	Sulphate (as SO_4)	mg/L	IS 3025:(Part-24)	200	400	24.2
21	Sulphide (as H_2S)	mg/L	IS 3025:(Part-29)	0.05	No Relaxation	N.D.
22	Total Alkalinity (as $CaCO_3$)	mg/L	IS 3025:(Part-23)	200	600	112
23	Total Hardness (as $CaCO_3$)	mg/L	IS 3025:(Part-21)	200	600	134
24	Zinc (as Zn)	mg/L	IS 3025(part-49)	5	15	BDL
C.	Parameters concerning toxic substances:-					
1	Cadmium (as Cd)	mg/L	IS 3025(part-41)	0.003	No Relaxation	N.D.
2	Cyanide (as CN)	mg/L	IS 3025(part-27)	0.05	No Relaxation	N.D.
3	Lead (as Pb)	mg/L	IS 3025(part-47)	0.01	No Relaxation	N.D.
4	Mercury (as Hg)	mg/L	IS 3025(part-48)	0.001	No Relaxation	N.D.
5	Molybdenum (as Mo)	mg/L	IS 3025(part-2)	0.07	No Relaxation	N.D.

Ultimate
ENVIRONMENTAL SYSTEMS
HDD-272, Phase III - Near JP Chowk
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com
Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

REPORT NO.08158

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	Parameter - (Bastiti Nagar Colony)
	Nickel (as Ni)			0.02	No Relaxation	N.D.
	Polychlorinated biphenyls			0.0005	No Relaxation	N.D.
	Polynuclear aromatic hydrocarbons (as PAH)			0.0001	No Relaxation	N.D.
	Arsenic (as As)			0.01	0.05	N.D.
	Chromium (as Cr)			0.05	No Relaxation	N.D.
	Trihalomethanes:					
	Bromoform			0.1	No Relaxation	N.D.
	Dibromochloromethane			0.1	No Relaxation	N.D.
	Bromodichloromethane			0.06	No Relaxation	N.D.
	Chloroform			0.2	No Relaxation	N.D.
D.	Pesticides:-					
	Alpha HCH			0.01		N.D.
	Beta HCH			0.04		N.D.
	Delta HCH			0.04		N.D.
	Alachlor			20		N.D.
	Aldrin / Dieldrin			0.03		N.D.
	Atrazine			2		N.D.
	Butachlor			125		N.D.
	Chlorpyriphos			30		N.D.
	DDT (o,p and p, p-Isomers of DDT, DDE and DDD)			1		N.D.
	Gamma HCH			2		N.D.
	2,4-Dichlorophenoxyacetic Acid			30		N.D.
	Endosulphan (alpha, beta and sulphate)			0.4		N.D.

Ultimate

HDD-272, Phase III - Near JP Chowk
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099
Ph : 0771 - 4027777 | Email : ultimateenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

REPORT NO. [illegible]

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012 Acceptable Limit	Permissible limit	RESULT Piezometer - (Kabir Nagar Colony)
	Ethion	[illegible]	[illegible]	3		N.D.
	Isoproturon	[illegible]	[illegible]	9		N.D.
	Malathion	[illegible]	[illegible]	190		N.D.
	Methyl Parathion	[illegible]	[illegible]	0.3		N.D.
	Monocrotophos	[illegible]	[illegible]	1		N.D.
	Phorate	[illegible]	[illegible]	2		N.D.
E	Microbial Parameters					
	Total Coliform	[illegible]	[illegible]			Absent
	E. Coli	[illegible]	[illegible]	[illegible]		Absent

Note : mg/lit : milligram per liter, N.D. : Not Detected

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- The use of the report for publication, arbitration or as legal dispute is forbidden.
- Test sample will be retained for 15 days after issue of the report unless otherwise agreed with customer.
- This is for information as the party has asked for only.

For ULTIMATE ENVIROLYTICAL SOLUTIONS

REVIEWED BY

AUTHORIZED SIGNATORY

---------- End of the test report ----------

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY

Jindal Power Limited, Tamnar

Annexure-6

TREATED EFFLUENT QUALITY MONITORING REPORT OF OCTOBER, 2022TO MARCH 2023.

Month	Parameters	Guard Pond	Treated Ash Water Pond	ETP Treated Effluent	STP Treated Effluent (Plant)	Limit
Oct-22	pH	7.6	7.3	7.5	7.7	**5.5-9.0**
	TSS (mg/l)	38	26	22	20	**100**
	COD (mg/l)	50	45	50	55	**250**
	BOD (mg/l)	7.5	7	8.5	10	**30**
	Oil &Grease (mg/l)	1	0.5	1	1.5	**10**
Nov-22	pH	7.4	7.2	7.8	7.4	**5.5-9.0**
	TSS (mg/l)	32	23	16	18	**100**
	COD (mg/l)	60	55	55	50	**250**
	BOD (mg/l)	11.5	10	7.5	12.5	**30**
	Oil &Grease (mg/l)	3	1.5	0.5	1	**10**
Dec-22	pH	7.6	7.4	7.5	7.8	**5.5-9.0**
	TSS (mg/l)	28	18	14	22	**100**
	COD (mg/l)	55	50	50	55	**250**
	BOD (mg/l)	11	10.5	8.5	13.5	**30**
	Oil &Grease (mg/l)	2.5	1	0.5	1.5	**10**
Jan-23	pH	7.4	7.2	7.6	7.5	**5.5-9.0**
	TSS (mg/l)	24	14	12	18	**100**
	COD (mg/l)	60	55	55	50	**250**
	BOD (mg/l)	11.5	10	8	13	**30**
	Oil &Grease (mg/l)	2	1	0.5	1	**10**
Feb-23	pH	7.6	7.3	7.4	7.8	**5.5-9.0**
	TSS (mg/l)	20	12	14	16	**100**
	COD (mg/l)	50	45	50	45	**250**
	BOD (mg/l)	11	9.5	9	12	**30**
	Oil &Grease (mg/l)	1.5	0.5	0.5	1.5	**10**
Mar-23	pH	7.3	7	7.6	7.5	**5.5-9.0**
	TSS (mg/l)	18	10	18	14	**100**
	COD (mg/l)	60	55	45	50	**250**
	BOD (mg/l)	9.7	9.2	8.7	9.6	**30**
	Oil &Grease (mg/l)	2	0.5	0.5	1	**10**

Note: - No effluent is being discharged outside plant premises and zero discharge is being maintained.

Ultimate
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099
Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1996

Name & Address Of The Customer	Report No	UES/TR/22-23/09631	
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Lab Ref No	UES/22-23/W/018488	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS			
Customer Sample Id /Sampling Location	Guard Pond Outlet	Latitude	22.10999
		Longitude	83.45537
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Sample Type	Waste Water		
Packing Of Sample	Plastic Bottle (3.0 ltr.), PVC CAN (1 Ltr.) Glass Bottle (1.0 ltr.)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	LIMITS AS PER CONSENT	RESULT
1	pH Value at 25.0°C	-	IS:3025:(Part-11):1983, RA 2012	5.5 To 9.0	7.32
2	Total Suspended Solid	mg/L	IS 3025:(Part-17): 1984, RA 2012	100	22.0
3	Chemical Oxygen Demand	mg/L	IS:3025:(Part-58): 2006, RA 2012	250	28.0
4	Bio-chemical Oxygen Demand at 27°C for three day	mg/L	IS:3025:(Part-44): 1993 RA 2014	30	8.0
5	Oil & Grease	mg/L	IS 3025 (Part 39):1986	10	N.D.

Note: mg/lt.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

- *The above analysis report refers to the particular sample received at our end and the use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only.*

		For ULTIMATE ENVIROLYTICAL SOLUTIONS
23/02/23		
REVIEWED BY		**AUTHORIZED SIGNATORY**

End of the test report

Ultimate
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099
Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1996

Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Report No	UES/TR/22-23/09632	
	Lab Ref No	UES/22-23/W/018489	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS			
Customer Sample Id /Sampling Location	Treated ash water Pond Outlet	Latitude	22.11349
		Longitude	83.46658
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Sample Type	Waste Water		
Packing Of Sample	Plastic Bottle (5.0 ltr.) Glass Bottle (1.0 ltr.)		
Sample Collected By	Laboratory Chemist		
Sample Condition At Receipt	Ok		

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	LIMITS AS PER CONSENT	RESULT
1	pH Value at 25.0°C	-	IS:3025:(Part-11):1983, RA 2012	5.5 To 9.0	7.52
2	Total Suspended Solid	mg/L	IS 3025:(Part-17): 1984, RA 2012	100	15.0
3	Chemical Oxygen Demand	mg/L	IS:3025:(Part-58): 2006, RA 2012	250	20.0
4	Bio-chemical Oxygen Demand at 27°C for three day	mg/L	IS:3025:(Part-44): 1993 RA 2014	30	5.8
5	Oil & Grease	mg/L	IS 3025 (Part 39):1986	10	N.D.

Note: mg/lit.:milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

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- *This is for information as the party has asked for above test(s) only.*

24/02/23

REVIEWED BY

For ULTIMATE ENVIROLYTICAL SOLUTIONS

AUTHORIZED SIGNATORY

----------*End of the test report*----------

Ultimate
ENVIROLYTICAL SOLUTIONS

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Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1996

Name & Address Of The Customer			
To, Jindal Power Limited P.O. Tamnar, District: Raigarh 496107 (C.G.)	Report No	UES/TR/22-23/09633	
	Lab Ref No	UES/22-23/W/018490-018491	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of Analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS		
Customer Sample ID / Sampling Location	1. STP Inlet 2. STP Outlet	Latitude 22.09927 Longitude 83.45135
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022	
Sample Type	Waste Water	
Sample Collected By	Laboratory Chemist	
Packing Of Sample	Plastic Bottle (3.0 ltr.*2), Glass Bottle (1.0 ltr.*2), PVC Can (1 ltr.*2)	
Quantity Received	Approx. 4 Ltr. Each	
Sample Condition At Receipt	Ok	

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	LIMITS AS PER CONSENT	RESULT	
					STP INLET	STP OUTLET
1	pH Value at 25.1°C	-	IS:3025:(Part-11): 1983, RA 2012	5.5 To 9.0	6.64	7.29
2	Total Suspended Solid	mg/L	IS 3025:(Part-17): 1984, RA 2012	100	57.5	25.9
3	Chemical Oxygen Demand	mg/L	IS:3025:(Part-58): 2006, RA 2012	250	76.0	24.0
4	Bio-chemical Oxygen Demand at 27°C for three day	mg/L	IS:3025:(Part-44): 1993 RA 2014	30	21.8	6.8
5	Oil & Grease	mg/L	IS 3025 (Part 39):1986	10	N.D.	N.D.

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

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- *This is for information as the party has asked for above test(s) only*

27/02/23

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AUTHORIZED SIGNATORY

End of the test report

Ultimate
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Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1996

Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Report No	UES/TR/22-23/09634	
	Lab Ref No	UES/22-23/W/018492	
	Date of Sampling	22/02/2023	
	Date of Receipt	23/02/2023	
	Date of Report	27/02/2023	
	Date of Analysis	START: 23/02/2023	END: 27/02/2023

SAMPLE DETAILS		
Customer Sample ID / Sampling Location	1. ETP Outlet	Latitude 22.09927 Longitude 83.45135
Customer Ref. No. & Date	4400026513, DATED: 11.11.2022	
Sample Type	Waste Water	
Sample Collected By	Laboratory Chemist	
Packing Of Sample	Plastic Bottle (3.0 ltr.*2), Glass Bottle (1.0 ltr.*2), PVC Can (1 ltr.*2)	
Quantity Received	Approx. 4 Ltr. Each	
Sample Condition At Receipt	Ok	

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	LIMITS AS PER CONSENT	RESULT
					ETP OUTLET
1	pH Value at 25.4°C	-	IS:3025:(Part-11): 1983, RA 2012	5.5 To 9.0	7.56
2	Total Suspended Solid	mg/L	IS 3025:(Part-17): 1984, RA 2012	100	20.4
3	Chemical Oxygen Demand	mg/L	IS:3025:(Part-58):2006, RA 2012	250	28.0
4	Bio-chemical Oxygen Demand at 27°C for three day	mg/L	IS:3025:(Part-44):1993 RA 2014	30	8.6
5	Oil & Grease	mg/L	IS 3025 (Part 39):1986	10	N.D.

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

Terms & conditions

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- *Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only*

23/02/23

REVIEWED BY

For **ULTIMATE ENVIROLYTICAL SOLUTIONS**

AUTHORIZED SIGNATORY

End of the test report

Annexure - 7(a)

"Under jurisdiction of Raigarh Court only"

साउथ ईस्टर्न कोलफील्ड्स लिमिटेड
South Eastern Coalfields Limited
(A subsidiary of Coal India Ltd).
Office of the General Manager, Raigarh Area
Chhote Atarmuda, Raigarh -496001
Fax No. 07762-223152.
Tel No. 07762-222008
E-mail- seclrgh@gmail.com
Website: www.secl.gov.in
CIN-U10102CT1985GO1003161

Regd. Office: Seepat Road, P.B: No. 60, Bilaspur- 495 001 (C.G)

6707
28.3.18

Ref. No. SECL/GM/RGH/2018/ 233 Date: 27/03/2018

To,
The Sub Area Manager,
Gare Pelma IV/2&3,
Raigarh Area

Dear Sir,

Please find enclosed herewith the complete set of Agreement papers which is submitted by M/s JPL,Tamnar. The Agreement papers have required signature and stamp on each page. Some of the pages are left the signature and stamp of the authorised person.

You are requested to please comply the same for execution of Agreement.

Encl: As above
P-1 to P-17

Yours faithfully,

27/3/2018

Chief Manager (Min) / SO (P&P)
SECL, Raigarh Area

Copy to: -

1. General Manager
Raigarh Area

Complied

29.3.18

SAM
Gare-Pelma,4/2&3
SECL Raigarh Area

SO/P&P
Rgh Area

छत्तीसगढ़ CHHATTISGARH

ARTICLES OF AGREEMENT

L 048672

THIS ARTICLES OF AGREEMENT made on this 7TH day of APRIL 2018 between the SOUTH EASTERN COALFIELDS LIMITED, A Company registered under the Indian Companies Act 1956 (herein after referred to as "the Company") which expression where the context so admits shall include its heirs, executors, administrators, legal representatives successors in interest and assigns) of the first part and M/s.JINDAL POWER LTD. (herein after referred to as "the Agency") which expression where the context so admits shall include its heirs, executors, Administrators, Legal representatives, successors in business and assigns) of the second part.

WHEREAS THE Agency has agreed to and submitted their consent vide No.JPL/Mines/2017/132 Date 05.10.2017 to execute the works for **"Fly-Ash dumping at Gare Pelma IV/2&3 OC 25% in OB by volume etc @ Rs.1.00 per cum+ GST @ 18%. Total Rate Rs.1.18 per cum"** as supervision and administrative charges on the terms and conditions as stipulated in the enclosed documents and subsequent amendments thereto for successful execution of the work. The charges payable on monthly basis as on before 10th of succeeding month.

NOW THIS AGREEMENT WITNESS TO STH AND IT IS HEREBY AGREED AS FOLLOWS :-

In this Agreement words and expressions shall have the same meanings as respectively assigned to them in the General and Special Terms and Conditions of the agreement.

The following documents shall constitute the Agreement between the Company and the Agency and each shall be read and construed as an integral part of the agreement.

1. Articles of Agreement.
2. Conditions of Agreement including General Terms & Conditions, special notes, additional terms and conditions, vocational training & safety norms, etc.
3. BG costing of Rs.10.0 lakh issued from Scheduled or Nationalized Bank as Accidental Surety in favour of SECL Raigarh Area.
4. SOP for dumping of Fly-Ash mixed at Gare Pelma IV/2 & 3 OC.

JINDAL POWER LIMITED TAMNAR, RAIGARH

7/4/2018

Staff Officer
(Proj & Plg)
SECL,Raigarh Area

अनुक्रमांक 7715 दिनांक 18-7-17 राशि 1000

क्रेता .... नाम .... साकिन

मार्फत ....

व्यवहार के बाबत [illegible] ....

प्रयोजन .... [illegible] ....

सेवा के लिये धन्यवाद

हितेन्द्र कुमार मेह.
स्टाम्प विक्रेता रायण
मोबा.: [illegible]

[illegible]

Baranda[illegible]

छत्तीसगढ़ CHHATTISGARH

L 048673

And whereas the Agency has/have agreed to execute upon the said work subject to the conditions set forth in the Agreement document which is part of the Agreement and such other conditions as are contained are enclosed herewith.

The Agreement shall abide by the Indian Laws.

In witness whereof, parties here have to set their respective hands and seals on the day, month and year first above written.

SIGNED, SEALED AND DELIVERED

Signed on behalf of the Agency

GAUTAM CHANDRA

Designation

Signed on behalf of the Company

7/4/2018

Designation

SUDHIR GHIRADKAR
CHIEF MGR (MIN) / S.O. (P&P)
RAIGARH AREA

Staff Officer
(Proj & Plg)
SECL, Raigarh Area

(Name of the Company with Address)
South Eastern Coalfields Limited,
Raigarh Area, Chhattisgarh, PB No.27
Raigarh (CG)

In the presence of :-

क्रमांक 7716 दिनांक 12-1-18 राशि 1002

क्रेता .... साकीन

मार्फत ....

संव्यवहार के बाबत ....

प्रयोजन .... रा. ....

सेवा के लिये धन्यवाद

हितेन्द्र कुमार मह.
स्टाम्प विक्रेता रायन
मोबा.: 9803[illegible]

हस्ताक्षर.

Bemarten

(15)

छत्तीसगढ़ CHHATTISGARH

S 583475

WITNESS-1

(Signature)
(SANJEEV KUMAR GUPTA)
(Name in Block letter)

Official Address
JINDAL POWER LIMITED
TAMNAR - RAIGARH

WITNESS-1

(Signature)
(SANDEEP MARKAM)
(Name in Block letter)

Official Address
SECL RAIGARH AREA

WITNESS-2

B. Govinda Rao

(Signature)
(B. GOVINDA RAO)
(Name in Block letter)

Official Address
JINDAL POWER LIMITED
TAMNAR - RAIGARH

WITNESS-2

Prashant Kumar

(Signature)
(PRASHANT KUMAR)
(Name in Block letter)

Official Address
SECL, RAIGARH AREA

7/2018

Staff Officer
(Proj & Plg)
SECL,Raigarh Area

अनुक्रमांक 7717 दिनांक 12-1-18 कीमत 50/-
क्रेता ______ निवासी ______
मार्फत ______
संव्यवहार के पक्षकार ______
प्रयोजन ______ बाजा॰ र.सा. ______

सेवा के लिये धन्यवाद

हितेन्द्र कुमार मेहर
स्टाम्प विक्रेता रायग.
मोबा.: 0893288734

हस्ताक्षर

Banwari lal

100x2 = 200/-
50x1 = 50/-
250/-

TREASURY OFFICE RAIGARH (C.G.)

(14)

JINDAL POWER

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED BY CORPORATE MANAGEMENT COMMITTEE OF JINDAL POWER LIMITED AT ITS MEETING HELD ON DECEMBER 8, 2016

APPOINTMENT OF MR. GAUTAM CHANDRA, WHOLETIME DIRECTOR AS ATTORNEY

"**RESOLVED THAT** Mr. Gautam Chandra S/o Sh. Jiban Kumar Chandra, residing at Flat 1102, Block A, Sunrise Green, Canal Bank Road, Ghuni New Town, Rajarhat, Gopalpur(m), North 24, Parganas, West Bengal-700159 working as Wholetime Director of the Company be and is hereby appointed as lawful Attorney of the Company and is authorised to perform the following functions:-

1. To sign and submit applications / letters before various departments / authorities / offices of Central and / or State Governments for obtaining approvals, permissions, clearances, licences etc. and execute necessary documents / deeds / papers on behalf of the Company.

2. To represent the Company before various departments / authorities / offices of Central and / or State Governments and make representations on behalf of the Company.

3. To do any other acts, deeds and things that may be considered necessary expedient, supplementary or incidental for the above mentioned purposes.

RESOLVED FURTHER that draft Power of Attorney, a copy of which was placed on table of the meeting, be and is hereby approved and Mr. Sunil Kumar Agrawal, AVP-Finance & Accounts of the Company be and is hereby authorised to sign the Power of Attorney on behalf of the Company.

RESOLVED FURTHER that a copy of the resolution be given to the concerned office(s) / Authority(ies)."

For Jindal Power Limited

Deepak Nathani
Company Secretary

Certified true copy/-

Dated: January 03, 2016
Place: New Delhi

Jindal Power Limited
Corporate Identity Number: U40101CT1995PLC008985
28, Nalatgarh Road, New Delhi – 110015
+91 11 45021852, 4502 1817-20 · +91 11 45021829 · www.jindalpower.com · info@jindalpower.com
[illegible] – 496 107, District Raigarh, Chhattisgarh

Staff Officer
(Proj & Plg)
SECL Raigarh Area

भारतीय गैर न्यायिक

पचास रुपये रु.50

FIFTY RUPEES Rs.50

INDIA NON JUDICIAL

छत्तीसगढ़ CHHATTISGARH

POWER OF ATTORNEY

WHEREAS M/s Jindal Power Limited (hereinafter called JPL) is a Company registered under the Companies Act, 1956 with Company Identification No. U04010CT1995PLC008985 and has its registered office at Tamnar, District Raigarh, Chhattisgarh - 496107

AND WHEREAS JPL has, vide resolution passed by its Corporate Management Committee in its meeting held on December 08, 2016, appointed Mr. Gautam Chandra, aged about 59 years S/o Mr. Jiban Kumar Chandra, presently residing at Flat 1102, Block A, Sunrise Green, Canal Bank Road, Ghuni New Town, Rajarhat, Gopalpur(m), North 24, Parganas, West Bengal-700159 working as Wholetime Director of the Company, as lawful attorney and authorized Mr. Sunil Agrawal, Associate Vice President-F&A, to execute this Power of Attorney in his favour.

Therefore, I, Sunil Agrawal, aged about 47 years and son of Mr Indra Chand Agrawal, Associate Vice President-F&A of the said JPL do hereby appoint, for and on behalf of the said JPL, Mr. Gautam Chandra, S/o Mr. Jiban Kumar Chandra, aged about 59 years presently residing at Flat 1102, Block A, Sunrise Green, Canal Bank Road, Ghuni New Town, Rajarhat, Gopalpur(m), North 24, Parganas, West Bengal-700159 and presently working as Whole Time Director with M/s. Jindal Power Limited, as Company's lawful attorney and authorize him to perform the following functions:

1. To sign and submit applications / letters before various departments / authorities / offices of Central and / or State Governments for obtaining approvals, permissions, clearances, licences etc. and execute necessary documents / deeds / papers on behalf of the Company.

2. To represent the Company before various departments / authorities / offices of Central and / or State Governments and make representations on behalf of the Company.

Staff Officer
(Proj & Plg)
SECL, Raigarh Area

छत्तीसगढ़ CHHATTISGARH

3. To do any other acts, deeds and things that may be considered necessary, expedient, supplementary or incidental for the above mentioned purposes.

I, Sunil Agrawal, S/o Indra Chand Agrawal, aged 47 years, Associate Vice President-F&A of the said JPL have been authorized vide above mentioned resolution dated December 08, 2016 to execute the Power of Attorney on behalf of JPL in favour of said attorney.

I do hereby state that all acts, deeds and things done by the said attorney in terms of this Power of Attorney shall be construed as acts, deeds and things done by JPL.

IN WITNESS WHEREOF I have signed this Power of Attorney on this THURSDAY day of JANUARY 2017.

EXECUTANT

For and on behalf of
JINDAL POWER LIMITED

(Sunil Agrawal)
Associate Vice President-F&A

Attorney's signature

Gautam Chandra,

WITNESS
1.
2. SRI KUMAR
JINDAL POWER LTD
TAMNAR, RAIGARH

ATTESTED BY

(Sunil Agrawal)
Associate Vice President-F&A

GENERAL TERMS AND CONDITIONS

1. DEFINITIONS

i. The word "company" or "employer" or "owner" wherever occurs in the conditions, means the South Eastern Coalfields Limited (SECL), represented at the headquarters of the company by the CMD/Director, SECL(CG) or his authorized representative or any other officer specially deputed for the purpose.

ii. The word "Principal Employer" wherever occurs, means the authorized representative or any other officer specially deputed by the company for the purpose.

iii. "The Agency" –The Agency means any agency who desired/intended to dump Fly-Ash in the mine belonging to Company including Custodian.

iv. "The site" shall mean the site of the agreement work including land and any building and erections thereon and any other land allotted by the company for Agency's use.

v. "Accepting" authority shall mean the management of the company and includes an authorized representative of company or any other person or body of persons empowered in this behalf by the company.

vi. A "Day" shall mean a day of 24 hours from midnight to midnight.

vii. Engineer-in-Charge/designated Officer-In-charge for this agreement will be Engineer-in-Charge/Agent/SAM Gare Pelma IV/2&3 OC (post / designation an officer to be given here as decided by the competent authority) who will be responsible for supervising and administering the agreement. Unless otherwise decided by the competent authority, Engineer In-charge for the awarded work will be the Area CGM/Area GM of the concerned Area/Project.

viii. The "work" shall mean the works required to be executed in accordance with the agreement or parts thereof as the case may be and shall include all extra or additional or any work of emergent nature, which in the opinion of the Engineer in-charge become necessary during the progress of the works to obviate any risk or accident or failure or become necessary for security.

ix. "Written notice" shall mean a notice or communication in writing and shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an office of the Corporation/Company for whom it is intended, or if delivered at or sent by registered mail/e-mail to the last business address known to him who gives the notice.

2. AGREEMENT DOCUMENTS

The following documents shall constitute the Agreement documents:

i. Articles of Agreement.

ii. Conditions of Agreement, including general terms & conditions, special notes and additional terms & conditions, vocational training & safety norms etc.

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SECL, Raigarh Area

(S. K. Gupta)

iii. BG of Rs. 10.00 lakh issued from Scheduled or Nationalized Bank as an accidental surety.

3. DISCREPANCIES AND ADJUSTMENTS THEREOF:

The document forming part of the agreement are to be treated as mutually explanatory to one another.

3.1 In the event of varying or conflicting provisions made in any of the document/documents forming part of the agreement, the accepting authority's decision/clarification shall hold good with regard to the intention of the document or agreement, as the case may be.

4. SECURITY DEPOSIT

The security deposit shall bear no interest.

- A Bank guarantee in the form attached herewith Annexure-A from any Nationalized/ Scheduled Bank. The BG issued by outstation bank shall be operative at its local branch at Raigarh (C.G.).

Refund of Security deposit:

- The refund of security deposit shall be subject to company's right to deduct/appropriate its dues against the Agency under this agreement. On completion of the work and certified as such by the Engineer-in-Charge, the security deposit remaining with the company shall be refunded.
- The validity of the Bank guarantee, if submitted by Agency, in lieu of performance security/security deposit shall be extended taking into consideration the period of extension.

5. RESPONSIBILITIES OF THE AGENCY.

i. The company reserves the right to let other Agency in connection with the project, also work and the Agency/Agencies shall co-operate in the works for **"Fly-Ash dumping at Gare Pelma IV/2&3 OC 25% in OB by volume etc."**

ii. The Agency/Agencies shall employ only competent, skillful and orderly men to do the work. The Engineer-in-charge shall have the right to ask the Agency to remove from the work site any men of the Agency who in his opinion is undesirable and the Agency will have to remove them immediately of such orders.

iii. Precautions shall be exercised at all times for the protection of persons (including employees) and property. The safety required or recommendation by all applicable laws codes, statutes and regulation will be observed by Agency. In case of accidents, he/they shall be solely responsible for compliance with all

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SECL, Raigarh Area

(S. K. Gupta)

the requirements imposed by the workmen's compensation Act or any other similar laws in force, and shall indemnify the company against claim on this account, if any.

The Agency shall at all times exercise reasonable precaution for the safety of employees in the performance of his/their agreement and shall comply with all applicable provisions of the safety laws drawn up by the State or Central Government or Municipalities and other authorities in India. The Agency shall comply with the provision of the safety hand book as approved and amended from time to time by the Government of India.

iv. List of vehicles to be allowed in the mine premises shall be provided and take permissions from Engineer-in-Charge along with list of manpower including supervisor. Agency shall responsible for Initial Medical Examination, Vocational training, I-Card, Driving license as per permission by Engineer-in - Charge.

v. In case of any accident arising out of non-compliance of any of the condition it shall be the sole responsibility of the Agency.

vi. Agency shall provide enabling conditions for obtaining the modification in mining plan, environmental conditions to suit Fly-Ash dumping in running mines, permission from Director of Mines, DGMS under Mines Act, Mines Rules, and Coal Mines Regulation as enforce on the date and conditions impose therein.

vii. The Agency shall familiarize themselves with and be governed by all laws and rules of India and local statutes and orders and regulation applicable to his/their work.

viii. The Agency shall furnish to the Engineer-in-Charge or his authorized representative with work reports from time to time regarding the Agency organization and the progress made by him/them in the execution of the work as per the agreement.

ix. The Agency shall not engage any person of less than 18 year age or females during night hours as required by relevant law.

x. The manpower reported duty must enter their attendance in the prescribed format while entering into the mine premises.

Staff Officer
(Proj & Plg)
SECL, Raigarh Area

(S. K. Gupta)

SPECIAL TERMS & CONDITIONS

1. The Agency shall deploy adequate number of matching equipment for the satisfactory execution of the work.
2. Only tipping trucks/dumpers with mechanical unloading arrangements shall be deployed by the Agency and in no case "Dala trucks/vehicles" shall be deployed or permitted to be deployed for the work.
3. Safety Features to be incorporated in Tippers/Trucks will be the part of the agreement and agency will be accepted and implemented in to-to.
4. Only equipment as elaborated above, in good and safe condition having valid fitness certificate permits/licenses etc. (wherever applicable) and in respect of which the required taxes/fees have been deposited and which are properly covered by insurance, shall be deployed for the work.
5. The company shall have the right to inspect or arrange inspection of the vehicles/equipment deployed by the Agency for the work at any time and declare any vehicle/equipment unsafe and ask for its immediate withdrawal from the site/operation. The Agency shall ensure prompt/immediate compliance of the same.
6. The Agency shall at his own cost, arrange for regular checking/maintenance/repair of the tipping trucks/equipment and keep them in good and safe conditions at all times. Maintenance cost of transportation, technical feasibility study, cost of modification of EC, cost of levelling of OB dump mixed with ash, cost of maintenance of road, cost of slope stability, cost of study of leaching etc. shall be borne by the ash filling agency.
7. Transportation of Fly-Ash should be done preferably through pipe.
8. If transportation made through public road, it should be properly covered by tarpaulin or other suitable devices.
9. Only experienced, skilled and disciplined operators/drivers of sound health, good behavior and antecedents having valid and requisite driving/statutory license shall be deployed by the Agency for operating the equipment/driving dumpers deployed for the work.
10. In no case any unauthorized driver of the tipping trucks or operator of pay loaders/equipment shall be permitted.
11. The Agency shall post adequate number of competent, experienced, skilled and disciplined persons having good antecedents for satisfactory execution of the work. A list of all such persons shall be kept in the office of the Agency and a copy of the same shall be furnished to the Engineer-in-Charge as and when required. All these persons shall be regular employees and under direct administrative control of the Agency and the management of the company shall have no responsibility/liability whatsoever in this regard.
12. No addition or alteration to the size of the body or any such tipping truck/dumper shall be carried out, without prior approval of the Engineer-in-

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SECL,Raigarh Area

(S. K. Gupta)

Charge. The truck/dumper shall be loaded only up to the maximum carrying capacity and shall not be overloaded under any circumstances.

13. No manual workers shall be engaged by the Agency for loading/unloading of the truck/dumper, under any circumstances whatsoever.
14. The Agency shall bring/take back and arrange for the transportation of the dumper/truck/equipment men and materials required for the work at his cost.
15. Agency's dumper/tipping truck should ply only on specified routes/roads. In case, plying of the dumper/tipping truck on any other route become necessary, due to any reason, prior approval for the same shall be taken by the Agency from the Engineer-in-Charge. In case of violation of this provision penalty may be imposed on the Agency and/or the agreement terminated/BG may be forfeited.
16. The work shall be executed round the clock or during specified period on all days of the week as directed by the Project Officer/ Engineer-in-Charge and the Agency shall be obliged to comply with the same.
17. The Agency should not have any claim whatsoever for the idleness of his equipment/dumpers due to non-availability of working site or any dislocation enroute and/or for any other reason.
18. The company shall have no responsibility/liability whatsoever for any accident/damage to the Agency's vehicle equipment in transit or while engaged in work.
19. If the company suffers any loss on account of suspension of production, for idleness of its equipment/employees or on any other account or damage to its property, due to any failure on the part of the Agency or due to any act of omissions or commission on the part of his representative/employees or from the trucks/ equipment of the Agency, the value of the same as assessed by the company, shall be recovered from the security deposit. The decisions of the company in this regard shall be final and binding on the Agency.
20. The Agency shall provide foot-wears, DGMS approved helmets, dust mask florescent jacket, safety appliances and other protective equipment to his employees as provided in the law, at its own cost. In case of failure on the part of the Agency to provide these protective equipment, the company may provide the same to the employees at the cost of the Agency.
21. Attested photocopy of driving License of all drivers/operators shall be deposited with the company.
22. The owner of the Agency or his authorized person will attend site co-ordination meeting as fixed by the Engineer in-charge from time to time to discuss all issues related to works in general and progress in particular. A site order book shall be kept at the site of work as far as possible, all orders regarding are to be entered in this book. All the entries shall be signed by the Engineer or his representative and Agency or his representative. The site order book shall not be removed from

Staff Officer
(Proj & Plg)
SECL, Raigarh Area

(S. K. Gupta)

the work site and Agency or his representative shall be bound to take note of all instructions and directions meant for the Agency.

23. The Agreement will be valid initially for the period of one year and will be extended on the satisfactory performance of the Agency submitted by the Engineer-in-Charge of the mine.
24. Jurisdiction in case of disputes. This MoU shall be governed by laws of India. Parties shall amicably resolve any dispute arising from this agreement and failing such amicable settlement the parties shall move to Civil Court Raigarh Area.
25. The said MoU could be terminated or suspended by SECL, in case the above said terms and conditions are not satisfied/ are being violated by giving one month show cause notice, as required. The suspension however shall be effected immediately with service of show cause notice. The MoU will be terminated if the causes for such violations are not found satisfactory.
26. If at any point of time the Fly-Ash supplied by JPL is found harmful or creating any type of pollution more than the permissible limit SECL shall have the right to stop dumping of Fly-Ash immediately till the matter is examined and settled amicably.
27. Cost of all studies related with Fly-Ash i.e. leaching effect, dump stability or otherwise to be done according to EC condition, DGMS, or CECB, from time to time, shall be borne by the JPL.
28. The Agency will be provided Dozer with operator and site supervisor with their own cost including diesel consumption for mixing and levelling of OB mixed with Fly-Ash. Transportation of OB to the site will be in the scope of the company.
29. Recommendations/ Findings of the DGMS inquiry will be applicable to the Agency in case of occurrence of any accident related with the dumping of Fly-Ash.
30. All the modalities, methodology, provisions related with Fly-Ash dumping and issues related with Mines Act 1952, Coal Mines Regulation 1957 will be accepted and implemented by the Agency.
31. Any other Amendments in the laws, By laws as well as directives, instructions, circulars, orders issued by the Competent Authority from MOC, GOI, State Govt. CG, Regulatory Authority, DGMS, CIL/SECL, issued from time to time related with Fly-Ash dumping will be applicable to the Agency.
32. Allotment letter by South Eastern Coalfields Limited (SECL) Raigarh Area on behalf of the Company and Provisions under Financial subject including Technical and other terms and conditions as stipulated therein will be accepted by the Agency including recommendations provisions therein.

Staff Officer
(Proj & Plg)
SECL, Raigarh Area

(S. K. Gupta)

(6)

i. Final report of Field Monitoring of Stability of Dump with 25% Fly-Ash and 75% overburden materials related to JPOCCM Mine, JPL.
ii. Annexure-A- SOP for Dumping of Fly-ash Mixed with OB at Gare Pelma IV/2&3 OC .

(S. K. Gupta)

Staff Officer
(Proj & Plg)
SECL, Raigarh Area

(5)

ANNEXURE-A

SOP FOR DUMPING OF FLY ASH MIXED WITH OB AT GARE PELMA IV/2&3

1. Organization :-

The entire operation shall be placed under the charge of an Assistant Manager holding first class managers certificate of competency and in each shift it shall be kept under the supervision of an overman and Mining sirdar exclusively.

2. Machinery Used :-

i) Dozer
ii) Trippers/Dumpers(carrying OB)
iii) Trucks (Carrying fly ash)
iv) Water tanker

3. General condition :-

i) The area of filling ash shall be specially earmarked and the same shall be marked on the plan and dumping fly ash shall be carried out accordingly.
ii) Distance of the dump area from the working faces shall not be less than 100m.
iii) Height of each bench shall not be more than 30m and the total height of the dump shall not exceed 90m.
iv) The angle of slope not exceeding the angle of repose of the dumped materials or 28° whichever is less and the overall slope of the dump shall not exceed 21° from horizontal.

4. Method of dumping fly ash :-

i) The fly ash shall be dumped in alternate layers/stages of height not exceeding 5.0m in each layer/stage.
ii) The fly ash shall be dumped over a compacted overburden having height not less than 30m.
iii) A row of OB dump not less than 15m width shall be dumped of height up to 5m all around the proposed area for fly ash dump.
iv) Mixture of fly ash overburden dump shall be in the ratio of 1:4
v) The above said mixture shall be dumped with in the area surrounded by such OB dumps.
vi) The above said area shall be dozed by the dozer and water is poured in the mixture of fly ash and OB dump.

Staff Officer
(Proj & Plg)
SECL,Raigarh Area

vii) In the next section/stage, only OB dumping shall be made to ensure that the ash is totality covered and protected from the OB dumps all around.

viii) Each layer/stage shall be adequately compacted by dozing .

ix) At the top of the dump that is at the finishing stage the dump shall be covered with 2m thick oil.

x) Plantation shall be done on the top of the above said dumps.

5. Transportation :-

i) The tipper/dumper shall be used for OB dump – a separate route shall be establish from OB face to above said dump area.

ii) The fly ash shall be transported on trucks having a separate route to dump in the above said dump area. The fly ash shall be covered during transportation by the trucks.

6. Operating practice of dumper/Tipper operator/Trucks operator/Dozer operator :-

i) On entering the tipping area the tipper operator/Truck operator must ensure the general condition of the dump yard especially the edge of the dump yard.

ii) No edge dumping shall be done. A dozer shall be used for pushing the dumped material regularly.

iii) At the edge of the dump a safety berm will be made to be left by the dozer operator. In any event this berm should not be less than one meter in height.

Manager
Gare Pelma IV/2&3

(3)

(6)

Annexure - B

Govt. of India
Ministry of Labour and Employment
Directorate General of Mines Safety

No.DGMS (Technical circular)/ 05 . Dhanbad, dated 13 . 10 . 2010

To

The owners, Agent and Manager
Of All Coal & Metalliferous mines

Sub: Safety features to be incorporated in Tippers / Trucks.

The most common mode of transport of coal/ ore and materials in opencast mines whether big or small size is trucks or tippers and their use is on increase. Unfortunately, the incidence of accidents due to such vehicle is alarmingly high in opencast mines.

The analyses of accidents revealed that majority of them have occurred due to: –

- Collision either due to Head on or head to tail
- Failure of brakes.
- Over speeding or rash driving by operators
- While reversing
- Fire
- Driving of the vehicle while body still raised.
- Short circuit due to problems in Auto-electrical system

A model code of practice was circulated vide circular no 11 of 1973 and was required to be enforced by the management. Mine managements have since been further reminded by various circulars.

The matter has since been again examined in this Directorate. It has been decided to ensure that in every mine where tipping trucks are being engaged either in opencast workings or on surface operations, the following safety features shall be incorporated so that the risk of accidents are minimized. These features are applicable to all types / model/ capacity of truck/ tippers

To Sivakali 22.11

(61)

Staff Officer
(Proj & Plg)
SECL, Raigarh Area

Safety features required in tippers/ trucks

1) **Cabin Guard Extension:**
Canopy shall cover the operator's cabin fully.

2) **Exhaust/ Retard Brake:**
Device to control the speed of truck while operating down the gradient. Refer DGMS (Tech) circular 02 of 2004.

3) **Propeller shaft guard:**
Propeller shaft guard as specified in DGMS (Tech) circular 10 of 1999.

4) **Tail gate protection:**
Protection of operator against collision either by head on or head to tail

5) **Limiting speed device:**
Enable mine management to decide the maximum speed of vehicle to be operated in mine. The device may be Electronic or mechanical type speed governors.

6) **Audio-visual alarm while reversing:**
The audio-visual alarm provided should confirm to DGMS (Tech.) Circular No 01 of 2010.

7) **Provision of two brakes:**
One of brakes shall be fail safe. For details refer DGMS circular 09 of 1999.

8) **Body lifting position locking arrangement:**
A booter along with an indication is provided to indicate the body is still in lifted position.

9) **Fire suppression System**
Refer DGMS circular 10 of 2004. The fire suppression system shall be a factory fitment and of approved type from Directorate.

10) **Blind spot mirror**
Operator can have view in blind spot area.

11) **Fire resistant hoses at hot zone:**
To decrease chance of fire

12) **Electric Wires and sleeves are to be of fire resistant quality:**
To decrease chance of fire

13) **Turbo Charge Guard and exhaust tube coated with heat insulated paint:**
To decrease chance of fire

Staff Officer
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SECL, Raigarh Area

JINDAL POWER LIMITED

14) **Battery Cut off Switch:**
To decrease chance of fire

15) **Retro reflective reflectors on all sides:**
For visibility of truck during night

16) **Seat belt reminder**
To alert operator for using the seat belt

17) **Proximity warning device**
To alert operator when approaching after vehicles / obstruction.

18) **Rear Vision System**
To assist operator during reversing .Refer DG Circular No. 12 of 2009

19) **Auto dipping System**
To reduce glaring on eyes of operator during night operation.

20) **Load Indicator and Recorder**
Enables management to detect and prevent over loading

The management shall ensure that the safety features listed above are provided in trucks/ tippers and shall be a part of **notice inviting tender** for new procurement and action shall be taken to provide the safety features in existing trucks within a specified time frame but not later than **one year** from the date of issue of this circular. The same features shall be included in **contractor's agreement** also while out-sourcing so that the trucks/ tippers are provided with required safety features before putting in to operation in the mines.

In the interest of safety all the Owners, Agent and Managers of the mine in which such transport vehicles are being used are requested to comply with the aforesaid safety requirement so that the accidents due to this cause are minimized and eliminated.

13/12/10

Director General of Mines Safety

Staff Officer
(Proj & Plg)
SECL, Raigarh (CG)

Ref: 0007BGR0203118

Date: 26-03-2018

To,

SOUTH EASTERN COALFIELDS LIMITED
OFFICE OF GENERAL MANAGER
RAIGARH AREA ,CHHOTE ATARMUDA
RAIGARH - 496001
INDIA

Sub: Confirmation of Issuance of Bank Guarantee
Ref: SECL/GM/RGH/SO(P&P)/BG/328/18/2027 DTD: 16.02.2018

Dear Sir/Madam,

We confirm that the Bank Guarantee is issued by us favoring yourself on behalf of:
JINDAL POWER LIMITED
2ND FLR,DCM BLDG,PLOT#94,
SEC-32,
GURGAON
HARYANA
INDIA
122001

Please find the details mentioned below-

Bank Guarantee No. & Date of Issue	Expiry Date	Claim Expiry Date	Amount of Bank Guarantee
0007BGR0203118 dated 13-02-2018	31-03-2019	31-03-2019	INR 1000000.00

We confirm that the officials who have signed the above Bank Guarantee are authorized to sign such documents on behalf of ICICI Bank Limited.

Thanking you,

Yours faithfully,
For ICICI Bank Limited

Authorized Signatory

NEHA JAGGI
DM-II J-3249

S.O (P&P)
29/3/18

AM(Envt)-RA
for further needful
27/3/18

Staff Officer
(Proj & Plg)
SECL,Raigarh Area

बावड़ आवक विभाग
क्र. ....
दिनांक 25/09/2017
.. ई. सी. एल. रायगढ़ क्षेत्र

क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
टी.व्ही.टॉवर रोड, रायगढ़ (छ.ग.)

Email ID: roraigarh.cecb@gmail.com, Ph. No. 07762-226569

जावक क्र. 897/क्षे. का./प.सं.मं./2017 रायगढ़, दिनांक 23/09/17

प्रति,

महाप्रबंधक,
मेसर्स एस.ई.सी.एल.
रायगढ़ क्षेत्र, रायगढ़,
जिला–रायगढ़ (छ.ग.)

विषय :– ओवर बर्डन एवं बैक फिलिंग में राखड़ के उपयोग बाबत्।
संदर्भ :– 1.आपका पत्र क्रमांक 181, दिनांक 01.09.2017
2.इस कार्यालय का पत्र पृष्ठांकन क्रमांक 860 दिनांक 07.09.2017

– – 00 – –

उपरोक्त विषयांतर्गत संदर्भित पत्रों के अवलोकन का कष्ट करें। छायाप्रति संलग्न है। आपके द्वारा गारे IV/2 & 3 ओपन कास्ट कोल माईन में ओवर बर्डन एवं बैक फिलिंग में 15 लाख घनमीटर राखड़ का उपयोग बाबत् सहमति दी गई है। अतः इस कोयला खदान के निकट संचालित थर्मल पॉवर प्लांट मेसर्स जिंदल पॉवर लिमिटेड, तमनार, जिला–रायगढ़ को भारत सरकार पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, नई दिल्ली द्वारा राखड़ के उपयोग से संबंधित जारी अधिसूचना के अनुसार राखड़ के उपयोग हेतु महाप्रबंधक मेसर्स एस.ई.सी.एल., रायगढ़ क्षेत्र, रायगढ़ से शीघ्र संपर्क कर एम.ओ.यू. किये जाने बाबत् निर्देशित किया गया है। सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

संलग्न :– उपरोक्तानुसार।

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

पृ. जावक क्र. /क्षे. का./प.सं.मं./2017 रायगढ़, दिनांक ....

प्रतिलिपि :–

सदस्य सचिव महोदय, छ.ग. पर्यावरण संरक्षण मण्डल, पर्यावास भवन, नार्थ ब्लॉक, सेक्टर–19, नया रायपुर की ओर सादर सूचनार्थ संप्रेषित।

SO(P&P) Pl. dim

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

S.E.C.L. Raigarh
Dy. No. E.E.
Date 25/9/17

Staff Officer
(Proj & Plg)
SECL, Raigarh Area

साउथ ईस्टर्न कोलफिल्डस लिमिटेड

South Eastern Coalfields Limited

(A MINI RATNA COMPANY)

RAIGARH AREA

NOTING SHEET
GARE PALMA IV/2&3 OCM

CIN:
U10102CT1985GOI003161

Ref.No. SECL/RGH/SAM/GP IV/2&3/22-23/1741 Dated: **28.02.2023**

Sub: Approval for Fly Ash Dumping at Gare Pelma IV/2&3 OCM, SECL

MoU was signed between SECL & M/s JPL as per Letter No. SECL/BSP/ENV/6740 Dated 23/08/2017 issued by General manager (Envt) SECL HQ & subsequently, agreement has been signed vide letter no SECL/GM/RGH/S.O.(P&P)/2018/435 dated 28.04.2018 for Fly Ash dumping at Gare Pelma IV/2&3 OCM.

As per agreement point no. 23 "**The agreement will be valid initially for the period of one year & will be extended on the satisfactory performance of the Agency submitted by the Engineer-in-Charge of the mine.**

Satisfactory Performance certificate is enclosed. Bank Guarantee is extended up to 31/3/2023(copy attached)

In light of above competent approval is required to allow fly ash utilization in Gare Palma IV/2&3 OCM as per conditions mentioned till **31.03.2023**.

Submitted for kind perusal & further necessary action please.

28/02/2023
SOGM (Min) SAM
Gare Palma IV/2&3 OCM

28 Feb 2023
Mine Manager
Gare Palma IV/2&3 OCM

28/02/23
Fly Ash I/C
Gare Palma IV/2&3 OCM

Pl. see N/s
Nodal Officer (Envt)
Raigarh Area

General Manager
Raigarh Area

- As per agreement BG for the amount of Rs.10.00 Lakh has been submitted by M/s JPL bearing No. 0007BGRO203118 dated 13/02/2018 further extended to 31/03/2023 (amendment dated 16.03.2022) issued from ICICI Bank New Delhi - 11000 (enclosed).
- Sub Area Manager, Gare Pelma IV/2&3 OCP Raigarh Area has submitted the satisfactory performance certificate
- MoU has been extended till 28.02.2023

Submitted for competent approval for extension of MoU for fly ash utilization in Gare Pelma IV/2&3 OCM till 31.03.2023.

28.2.23
N.O.(Envt)
SECL Raigarh Area

28/02/23
S.O.(P&P)
SECL Raigarh Area

28/2/23
General Manager
SECL Raigarh Area

28/02/2023

पचास रुपये

FIFTY RUPEES

रु.50

Rs.50

INDIA NON JUDICIAL

छत्तीसगढ़ CHHATTISGARH

U 295145

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt. 03.05.2018 Between M/s **Jindal Power Limited** a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhattisgarh (hereafter referred as JPL) and M/s **Ahmed Fly Ash Bricks** (Capacity- **15000**...Bricks /day)

Town – **Lailunga** Tahsil – ...**Lailunga**... District-...**Raigarh**.... (hereafter referred as Vendor)

1. Scope of work-

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demand from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- **Ahmed Fly Ash Bricks** will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- **Ahmed Fly Ash Bricks** will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. Period of validity of agreement:-

This agreement can be terminated by any of the two parties by giving one month's notice.

3. Termination of Agreement:-

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. Dispute settlement & arbitration:-

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

For

AHMED BRICKS LAILUNGA

Prop- Wasim Ahmed

Mo. 9074175279

Authorized Representative
of the Fly ash brick manufacture at village .....
Disst. .....

Witness:

For

M/s Jindal Power Limited

Authorized Representative
A.K.Singh
GM-AHP & AUC

B. Govinda Rao

1. Govinda Rao-GM-EMD

2. Nilesh Neema-AGM-AUC

पचास रुपये

FIFTY RUPEES

रु.50

Rs.50

INDIA

INDIA NON JUDICIAL

छत्तीसगढ़ CHHATTISGARH

U 295146

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt. 03.05.2018. Between **M/s Jindal Power Limited** a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhattisgarh (hereafter referred as JPL) and M/s – **A One Fly Ash Bricks** (Capacity- **15000**...Bricks /day) Village - **Majiama** Tahsil – ...**Lailunga**... District- ...**Raigarh**..... (hereafter referred as Vendor)

1. Scope of work:

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demand from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis.
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- **A One Fly Ash Bricks** will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- **A One Fly Ash Bricks** will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. Period of validity of agreement::

This agreement can be terminated by any of the two parties by giving one month's notice.

3. Termination of Agreement:-

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. Dispute settlement & arbitration:-

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

For

.....

for Apne Fly Ash Bricks

94241-87888, 97541-87888

Authorized Representative

of the Fly ash brick manufacture at village Majhgawan

Disst. Raigarh

Witness:

For

M/s Jindal Power Limited

Authorized Representative

A.K.Singh

GM-AHP & AUC

B. Govinda Rao

1. Govinda Rao-GM-EMD

2. Nilesh Neema- AGM-AUC

पचास रुपये

FIFTY RUPEES

रु.50

Rs.50

INDIA

INDIA NON JUDICIAL

छत्तीसगढ़ CHHATTISGARH

U 295149

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt. 03.05.2018. Between **M/s Jindal Power Limited** a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhattisgarh (hereafter referred as JPL) and M/s **Patel Fly Ash Brick** (Capacity- 15000...Bricks /day)

Village -Banekela Tahsil – ...**Lailunga**... District- ...**Raigarh**.... (hereafter referred as Vendor)

1. Scope of work:

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demaad from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- Patel **Fly Ash Brick** will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- **Patel Fly Ash Brick** will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. Period of validity of agreement:-

This agreement can be terminated by any of the two parties by giving one month's notice.

3. Termination of Agreement:-

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. Dispute settlement & arbitration:-

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

For .....

9617316200

Authorized Representative
of the Fly ash brick manufacture at village .....
Disst. .....

Witness:

For

M/s Jindal Power Limited

Authorized Representative
A.K.Singh
GM-AHP & AUC

1. Govinda Rao-GM-EMD

2. Nilesh Neema- AGM-AUC

पचास रुपये

रु.50

FIFTY RUPEES

Rs.50

INDIA

INDIA NON JUDICIAL

छत्तीसगढ़ CHHATTISGARH

U 295148

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt. 03.05.2018. Between **M/s Jindal Power Limited** a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhattisgarh (hereafter referred as JPL) and M/s – **Maa Bhagwati Fly Ash Bricks** (Capacity- 15000...Bricks /day) Village – **Kunjara** Tahsil – ...**Lailunga**... District- ...**Raigarh**..... (hereafter referred as Vendor)

1. Scope of work-

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demand from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- – **Maa Bhagwati Fly Ash Bricks** will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- – **Maa Bhagwati Fly Ash Bricks** will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. Period of validity of agreement:-

This agreement can be terminated by any of the two parties by giving one month's notice.

3. Termination of Agreement:-

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. Dispute settlement & arbitration:-

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

For

M/s ..... Proprietor

Authorized Representative
of the Fly ash brick manufacture at village .....
Disst. .....

Witness-

For

M/s Jindal Power Limited

Authorized Representative
A.K.Singh
GM-AHP & AUC

B. Govinda Rao

1. Govinda Rao-GM-EMD

2. Nilesh Neema- AGM-AUC

छत्तीसगढ़ CHHATTISGARH U 283621

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt ...02-04.2018... between M/s Jindal Power Limited a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhattisgarh (hereafter referred as JPL) and M/s **Kamla Sidar,** (Capacity-...(15000 +10000)=25000.....Bricks /day) Village – **Tapranga**.... Tehsil –... **Tamnar**.. District- **Raigarh**.. (Hereafter referred as Vendor)

1. Scope of work-

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demand from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- Vendor will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- Vendor...will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. Period of validity of agreement:-

This agreement can be terminated by any of the two parties by giving one month's notice.

3. **Termination of Agreement:-**

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. **Dispute settlement & arbitration:-**

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

For .....

Kamla Sidar
Proprietor

14/4/2018

Authorized Representative
of the Fly ash brick manufacture at village .....
Dist. .....

For

M/s Jindal Power Limited

Authorized Representative
A.K.Singh
GM-AHP & AUC

Witness:

1. Govinda Rao
GM-EMD

2. Nilesh Neema
AGM-AUC

छत्तीसगढ़ CHHATTISGARH

U 295143

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt. **23.04.2018**. between **M/s Jindal Power Limited** a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhatisgarh (hereafter referred as JPL) and M/s **Nilmani Patel** (Capacity- **15000**...Bricks /day)Village – **Milupara** .... Tahsil – ...**Tamnar**... District-...**Raigarh**..... (hereafter referred as Vendor)

1. Scope of work-

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demand from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- Vendor will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- Vendor will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. **Period of validity of agreement:-**

This agreement can be terminated by any of the two parties by giving one month's notice.

3. **Termination of Agreement:-**

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. **Dispute settlement & arbitration:-**

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

For .....

23/4/18

(Nilmani Patel) 9755975468

Authorized Representative
of the Fly ash brick manufacture at village .....
Disst. .....

Witness:

For

M/s Jindal Power Limited

Authorized Representative
A.K.Singh
GM-AHP & AUC

B. Govinda Rao

1. Govinda Rao-GM-EMD

23/4/18

2. Nilesh Neema- AGM-AUC

छत्तीसगढ़ CHHATTISGARH U 295144

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt. 23.04.2018. between **M/s Jindal Power Limited** a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhatisgarh (hereafter referred as JPL) and M/s **Tushar Patel** (Capacity-**15000**...Bricks /day)Village – **Tapranga**.... Tahsil – ...**Tamnar**... District- ...**Raigarh**..... (hereafter referred as Vendor)

1. Scope of work-

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demand from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis.
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- Vendor will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- Vendor will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. Period of validity of agreement:-

This agreement can be terminated by any of the two parties by giving one month's notice.

3. Termination of Agreement:-

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. Dispute settlement & arbitration:-

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

For

Tushar Patel

23.04.2018

Authorized Representative
of the Fly ash brick manufacture at village .....
Disst. .....

Witness:

For

M/s Jindal Power Limited

Authorized Representative
A.K.Singh
GM-AHP & AUC

1. Govinda Rao-GM-EMD

2. Nilesh Neema- AGM-AUC

छत्तीसगढ़ CHHATTISGARH U 295141

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt. 23.04.2018. between **M/s Jindal Power Limited** a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhatisgarh (hereafter referred as JPL) and M/s **Khan fly Ash Bricks** (Capacity- **15000**...Bricks /day)Village - **Amagaon, Dhourabhata** Tahsil – ...**Tamnar**... District- ...**Raigarh**..... (hereafter referred as Vendor)

1. Scope of work-

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demand from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- Vendor will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- Vendor will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. Period of validity of agreement:-

This agreement can be terminated by any of the two parties by giving one month's notice.

3. Termination of Agreement:-

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. Dispute settlement & arbitration:-

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

For

.....

7389558786

Authorized Representative
of the Fly ash brick manufacture at village .....
Disst. .....

Witness:

For

M/s Jindal Power Limited

Authorized Representative
A.K.Singh
GM-AHP & AUC

1. Govinda Rao-GM-EMD

2. Nilesh Neema- AGM-AUC

छत्तीसगढ़ CHHATTISGARH

U 295140

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt. **23.04.2018** between **M/s Jindal Power Limited** a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhatisgarh (hereafter referred as JPL) and M/s **B G fly Ash Bricks** (Capacity- **15000**...Bricks /day)Village – **Dhourabhata** Tahsil - ...**Tamnar**... District- ...**Raigarh**..... (hereafter referred as Vendor)

1. Scope of work-

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demand from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- Vendor will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- Vendor will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. Period of validity of agreement:-

This agreement can be terminated by any of the two parties by giving one month's notice.

3. Termination of Agreement:-

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. Dispute settlement & arbitration:-

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

For

Bhupendra Kumar Gupta

7999681982

23/01/2017

Authorized Representative
of the Fly ash brick manufacture at village .....
Disst. .....

Witness:

For

M/s Jindal Power Limited

Authorized Representative
A.K.Singh
GM-AHP & AUC

1. Govinda Rao-GM-EMD

2. Nilesh Neema- AGM-AUC

छत्तीसगढ़ CHHATTISGARH U 283622

Agreement for making Fly ash Bricks on behalf of M/s Jindal Power Limited, Village Tamnar, District Raigarh (C.G)

The agreement is executed on dt. ...**14-04.2018**... between M/s Jindal Power Limited a Company incorporated under the Companies Act 1986 having its registered office at Kharsia Road Raigarh, District Raigarh Chhattisgarh (hereafter referred as JPL) and M/s **Jageshwar Behra.** (Capacity-...**(20000 +15000)=35000**.....Bricks /day) Village – **Bagbadi** Tehsil – ... **Tamnar**.. District- **Raigarh**.. (Hereafter referred as Vendor)

1. Scope of work:

Under JPL scope:

a- JPL will provide dry fly ash for fly ash brick manufacture on need basis or as demand from brick manufacturing site.
b- JPL will make available dry fly ash at brick manufacturing site free of cost.
c- JPL will provide technical assistance to brick manufacture on regular basis
d- Control of fugitive emission during transportation is in JPL scope.

Under Vendor scope:

a- ..... will manufacture fly ash bricks on behalf of Jindal Power Limited.
b- Selling/marketing of Fly ash bricks will be in manufacturer scope.
c- .....will bear all the cost involved in manufacturing of bricks including water, electricity charges.
d- Fugitive emission from dry fly ash at site shall be controlled by brick manufacture.

2. Period of validity of agreement:-

This agreement can be terminated by any of the two parties by giving one month's notice.

3. **Termination of Agreement:-**

For reasons covered elsewhere in the contract documents if the contract is to be terminated, one month notice shall be given by JPL. In such an eventuality, outstanding payment shall be made by JPL. However if the brick manufacture desires to terminate the contract, he will be required to give at least one month notice.

4. **Dispute settlement & arbitration:-**

Any dispute or difference arising out of in connection of this contract shall be referred the sole arbitrator President O.P. Jindal Super Thermal Power Plant, JPL, Tamnar, Raigarh (C.G) and the decision given by the sole arbitrator will be conclusive & final & be binding on both the parties.

14-4-18

For .....

M/S JAGESHWER BEHRA - I
At/Po-BAGBAHI TAMNAR
DIST- RAIGARH (C.G.)

Authorized Representative
of the Fly ash brick manufacture at village .....
Dist. .....

For

M/s Jindal Power Limited

Authorized Representative
A.K.Singh
GM-AHP & AUC

Witness:

1. **Govinda Rao-GM-EMD**

14/4/2018

2. **Nilesh Neema- AGM-AUC**

Annexure -7 (c)

REGIONAL OFFICE
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD,
T.V. TOWER ROAD, RAIGARH (C.G.)

No. 7162/RO/TS/1338/2021 Raigarh, Date 18/01/22

To,

M/s Jindal Power Limited,
Village- Tamnar, District- Raigarh (C.G.)

Subject:- Permission for filling in low lying areas with pond ash/fly Ash.

Ref:-
1. CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low lying Areas and in stowing of Abandoned mines/Quarries.
2. MoEF & CC GOI O.M. No. 22-13/2019-I.A.II dated 28.08.2019
3. MoEF & CC GOI notification no. SO 5481(E) dated 31.12.2021.
4. Head Office, Nawa Raipur Atal Nagar Raipur, letter no. 8332 dated 28.12.2020
5. Collector order letter dated 22.07.2021.
6. Your application dated 20.09.2021.

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With reference to the above, mentioned letter no (6) the office has examined the proposal in details submitted by you having areas Khasra No.- 74/2K, 74/2N, 87/1 and 74/1, Total Rakba-9.050 Hect. in Village-Hamirpur, Tehsil-Tamnar, District-Raigarh (C.G.). Permission for filling in low lying areas with pond ash/fly Ash in **Khasra No.- 74/2K, 74/2N, 87/1 and 74/1, Total Rakba-9.050 Hect. in Village-Hamirpur, Tehsil-Tamnar, District-Raigarh (C.G.) for quantity 90,000 MT** is subject to the following terms & conditions.

<u>Terms & Conditions</u> :-

1. M/s Jindal Power Limited, 3400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.) shall have to abide by the CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low lying areas. Industry shall ensure compliance of MoEF & CC GOI O.M. No. 22-13/2019-IA. II Dated 28.08.2019 in case of violation, EC will be imposed to the industry.
2. This permission is valid for a period of 90 days from date of issue of this letter.
3. As per the Fly Ash notification by MOEF & CC dated 31.12.2021, it shall be the responsibility of the transporters of vehicle owner to deliver ash to authorized purchaser or user agency and if it is not complied, then an environmental compensation of Rs. 1500 per ton on such quantity as mis-delivered to unauthorised users or non delivered to authorized users will be imposed besides prosecution of such non-compliant transporters by State Pollution Control Board (SPCB) of Pollution Control Committee (PCC).
4. Vehicle used for transportation of Flyash/Bottom Ash will be equipped with GPS system. The Power Plant shall ensure the fly ash/bottom ash will be filled in areas Khasra No.- 74/2K, 74/2N, 87/1 and 74/1, Total Rakba-9.050 Hect. in Village-Hamirpur, Tehsil-Tamnar, District-Raigarh (C.G.).
5. The transportation of fly ash/bottom ash for filling low lying areas need to be done by tankers/bulkers or mechanically designed covered trucks.
6. Industry shall dispose off fly ash/bottom ash only upto current ground level, in case of violation, EC will be imposed to the industry.

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7. Proper water sprinkling activities shall be done on haul road and transportation road by dumping of fly ash in the aforesaid areas for mitigation of air pollution.

8. After filling fly ash the low-lying areas shall be covered by 500 mm topsoil.

9. Industry shall provide earthen embankment to avoid flowage of fly ash in near by areas.

10. After completion of fly ash filling work in low lying area, industry shall submit Work Completion Certificate to Chhattisgarh Environment Conservation Board, Raigarh.

11. Industry shall submit details (permits of fly ash & bill / of transportation) of fly ash transported by Khasra No.- 14/29, 14/25, 01/1 and 14/1, Total Rakba-9.050 Hect. in Village-Hamirpur, Tehsil-Tamnar, District-Raigarh (C.G.) every 15 days.

12. Industry shall ensure proper wind breaking shield to avoid dust nuisance near by area.

13. Industry shall ensure display board near dumping site having information such as name of industry Khasra No., area quantity of fly ash granted etc.

14. M/s Jindal Power Limited, 1400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.), shall have to abide by the guidelines of the Central Government/State Government regarding fly ash utilization issued from time to time.

15. The issuance of this permission does not convey and property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central/State laws or regulations.

16. The above permission shall be revoke, if any conditions are violated by the M/s Jindal Power Limited, 1400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.) with immediate effect.

This "Permission" is being issued only for the purpose of ash filling in low-lying area of aforesaid Khasra Nos. mentioned in above and this shall not be treated as consent under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act 1981.

Regional Officer
C.G. Environment Conservation Board,
Raigarh (C.G.)

Endt. No. /RO/TS/CECB/2019 Raigarh, Date _____

Copy to :-

01. The Member Secretary, C.G. Environment Conservation Board, Raipur for information please.

02. Collector District – Raigarh for information please.

Regional Officer
C.G. Environment Conservation Board,
Raigarh (C.G.)

REGIONAL OFFICE
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD,
T.V. TOWER ROAD, RAIGARH (C.G.)

No. /RO/TV/CECB/2021 Raigarh, Date ——

To,

M/s Jindal Power Ltd.,
Tamnar, District- Raigarh (C.G.)

Subject :- No Objection Certificate for ash filling in low lying area/in stowing of Abandoned mines/Quarries with pond ash/Fly Ash

Ref :- 1. CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low lying Areas and in stowing of Abandoned mines/Quarries.
2. MoEF & CC GOI O.M. No. 22-13/2019-I.A.III dated 28.08.2019
3. Head Office, Nawa Raipur Atal Nagar Raipur, letter no. 8332 dated 12.12.2020
4. Collector order letter dated 22.07.2021
5. Your application dated 28.09.2021

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With reference to the above, commitee formed by Collector Raigarh has examined the proposal in details submitted by you having areas Khasra No. 274, 276, 277, 279, 291, 293, 294, 295, 296 & 278, Total Rakba- 4.680 Hect. in Village-Tehlirampur, Tamnar. Proposal submitted by you for ash filling in Private land the Regional Office, Raigarh has No Objection for ash filling work in the low lying areas/ Abandoned mines/Quarries situted in Khasra No. 274, 276, 277, 279, 291, 293, 294, 295, 296 & 278, Total Rakba- 4.680 Hect. in Village-Tehlirampur, Tamnar, District-Raigarh (C.G.) for quantity 1,00,000 MT subject to the following terms & conditions.

Terms & Conditions :-

1. M/s Jindal Power Ltd. 1400 MW Power Plant at Tamnar, District- Raigarh (C.G.) shall have to abide by the CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low Lying areas industry shall ensure compliance of MoEF & CC GOI O.M. No. 22-13/2019-IA. III Dated 28.08.2019 in case of violation, EC will be imposed to the industry.
2. Vehicle used for transportaion of FlyAsh/Bottom Ash will be equipped with GPS system.
3. The Power Plant shall ensure that fly ash/bottom ash will be filled in areas khasra No. 274, 276, 277, 279, 291, 293, 294, 295, 296 & 278, Total Rakba- 4.680 Hect. in Village-Tehlirampur, Tamnar, District-Raigarh (C.G.).
4. The transportation of fly ash/Bottom ash shall be fully covered vehicle or by tarpaulin, during filling of ash from the ash pond to low lying areas/Abandoned mines/Quarries of the concerned village.

5. Industry shall dispose off fly ash/bottom ash only upto current ground level. In case of violation, EC will be imposed to the industry.
6. Proper water sprinkling activities shall be done on haul road and transportation road by dumping of fly ash in the aforesaid areas for mitigation of air pollution.
7. After filling fly ash the low lying areas shall be covered by 500 mm topsoil.
8. After completion of fly ash filling work in low lying area, industry shall submit Work-Completion Certificate to Chhattigarh Environment Conservation Board, Raigarh.
9. Industry shall install appropriate No. of piezometers in the proposed fly ash disposal area.
10. Industry shall not cut/damage the tree in the proposed land of village- Tehlirampur, Tamnar, District-Raigarh (C.G.)
11. Industry shall submit details (Quantity of fly ash & Bill T of transportation) of fly ash transported to Khasra No. 274, 276, 277, 279, 291, 293, 294, 295, 296 & 278, Total Rakba- 4.680 Hect. in Village Tehlirampur, Tamnar, District-Raigarh (C.G.) every 15 days.
12. M/s Jindal Power Ltd. at Tamnar, District- Raigarh (C.G.) shall have to abide by the guidelines of the Central Government/State Government regarding fly ash utilization issued from time to time.
13. The issuance of this NOC does not convey and property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central/State laws or regulations.
14. The above NOC shall be revoke, if any conditions are violated by the M/s Jindal Power Ltd. at Tamnar, District- Raigarh (C.G.) with immediate effect.

This "No Objection Certificate" is being issued only for the purpose of ash filling in low lying areas of aforesaid Khasra Nos. mentioned in above and this shall not be treated as consent under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act 1981.

Regional Officer
C.G. Environment Conservation Board,
Raigarh (C.G.)

Endt. No. /RO/TS/CECB/2021 Raigarh, Date

Copy To :-

1. The Member Secretary, C.G. Environment Conservation Board, Raipur for information please.
2. Collector District – Raigarh for information please.

Regional Officer
C.G. Environment Conservation Board,
Raigarh (C.G.)

REGIONAL OFFICE
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD,
T.V. TOWER ROAD, RAIGARH (C.G.)

email:cecbrgh@rediffmail.com

No. 172- /RO/TS/CECB/2022

Raigarh, Date 22/03/22.

To,

M/s Jindal Power Limited,
Village- Tamnar, District- Raigarh (C.G.)

Subject :- Permission for filling in low lying areas/Abandoned mines/Quarries with pond ash/Fly Ash.

Ref :- 1. CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low lying Areas and in filling of Abandoned mines/Quarries.
2. MoEF & CC GOI O.M. No. 22-13/2019-I.A.III dated 28.08.2019.
3. Head Office, Nava Raipur Atal Nagar Raipur, letter no. 8332 dated 13.12.2022.
4. Collector order letter dated 22.07.2021.
5. Your application dated 10.01.2022

With reference to the above, committee formed by Collector Raigarh has examined the proposal of quarry amendment in details submitted by you having areas Khasra No. 319, Rakba- 0.490 Hect. in Village-Tamnar, Tehsil-Tamnar, District-Raigarh. Permission for filling in low lying areas/Abandoned mines/Quarries with pond ash/Fly Ash in Khasra No. 319, Rakba- 0.490 Hect. in Village-Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.) for quantity 30,000 MT subject to the following terms & conditions.

Terms & Conditions :-

1. M/s Jindal Power Limited, 3400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.), shall have to abide by the CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low lying areas. Industry shall ensure compliance of MoEF & CC GOI O.M. No. 22-13/2019-IA. III Dated 28.08.2019 in case of violation, EC will be imposed to the industry.
2. As per the fly Ash notification by MOEF & CC dated 31.12.2021, it shall be the responsibility of the transporters of vehicle owner to deliver ash to authorized purchaser or user agency and if it is not complied, then an environmental compensation of Rs. 1500 per ton on such quantity as mis-delivered to unauthorized users or non-delivered to authorized users will be imposed besides prosecution of such non-compliant transporters by State Pollution Control Board (SPCB) of Pollution Control Committee (PCC).
3. Vehicle used for transportation of Flyash/Bottom Ash will be equipped with GPS system.
4. The Power Plant shall ensure that fly ash/bottom ash will be filled in areas Khasra No. 319, Rakba- 0.490 Hect. in Village-Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.).

5. The transportation of fly ash/bottom ash for filling low lying areas need to be done by tankers/bulkers or mechanically designed covered trucks.
6. Industry shall dispose off fly ash/bottom ash only upto current ground level, in case of violation, EC will be imposed to the industry.
7. Proper water sprinkling activities shall be done on haul road and transportation road by dumping of fly ash in the aforesaid areas for mitigation of air pollution.
8. After filling fly ash the low-lying areas shall be covered by 500 mm topsoil.
9. After completion of fly ash filling work in low lying area, Industry shall submit Work-Completion Certificate to Chhattigarh Environment Conservation Board, Raigarh.
10. Industry shall install appropriate number of piezometers in the proposed fly ash disposal area.
11. Industry shall submit details (quantity of fly ash & Bill T of transporation) of fly ash transported to Khasra No. 319, Rakba- 0.490 Hect. in Village-Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.) every 15 days.
12. Industry shall ensure proper wind breaking shield to avoid dust nuisance near by area.
13. M/s Jindal Power Limited, 3400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.) shall have to abide by the guidelines of the Central Government/State Government regarding fly ash utilization issued from time to time.
14. The issuance of this permission does not convey and property rights in either real or personal property, or any exclusive privileges, nor does it authorise any injury to private property or any invasion of personal rights, nor any infringement of Central/State laws or regulations.
15. The above permission shall be revoke, if any conditions are violated by the M/s Jindal Power Limited, 3400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.) with immediate effect.
16. The letter of this office issued via letter no. 1854 dated 30.12.2021 shall be treated cancelled from the date of issue of this letter.

This "Permission" is being issued only for the purpose of ash filling in low-lying areas of aforesaid Khasra Nos. mentioned in above and this shall not be treated as consent under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act 1981.

Regional Officer
C.G. Environment Conservation Board, Raigarh.

Endt. No. /RO/TS/CECB/2022 Raigarh, Date _____
Copy to :-

1. The Member Secretary, C.G. Environment Conservation Board, Raipur for information please.
2. Collector District – Raigarh for information please.

Regional Officer
C.G. Environment Conservation Board, Raigarh

REGIONAL OFFICE
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD,
T.V. TOWER ROAD, RAIGARH (C.G.)

email id-rogarh.cecb@gmail.com

No. 4353 /RO/TS/CECB/2022 Raigarh, Date 31/05/2022

To,

M/s Jindal Power Limited,
Village- Tamnar, District- Raigarh (C.G.)

Subject :- Permission for filling in low lying areas/Abandoned mines/Quarries with pond ash/Fly Ash.

Ref :- 1. CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low lying Areas and in stowing of Abandoned mines/Quarries.
2. MoEF & CC GOI O.M. No. 22-13/2019-I.A.III dated 28.08.2019.
3. Head Office, Nawa Raipur Atal Nagar Raipur, letter no. 8332 dated 12.12.2020.
4. Collector order letter dated 22.07.2021.
5. Your application dated 29.04.2022

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With reference to the above, committee formed by Collector Raigarh has examined the proposal in details submitted by you having areas Khasra No.11/2/9, 11/8 & 11/13, Total Rakba- 7.285 Hect. in Village-Bangursiya, Tehsil & District-Raigarh. Permission for filling in low lying areas/Abandoned mines/Quarries with pond ash/Fly Ash in Khasra No.11/2/9, 11/8 & 11/13, Total Rakba- 7.285 Hect. in Village-Bangursiya, Tehsil & District-Raigarh (C.G.) for quantity 88,000 MT subject to the following terms & conditions.

Terms & Conditions :-

1. M/s Jindal Power Limited, 1400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.), shall have to abide by the CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low Lying areas. Industry shall ensure compliance of MoEF & CC GOI O.M. No. 22-13/2019-IA. III Dated 28.08.2019 in case of violation, EC will be imposed to the industry.
2. As per the Fly Ash notification by MOEF & CC dated 31.12.2021 it shall be the responsibility of the transporters or vehicle owner to deliver ash to authorized purchaser or user agency and if it is not complied, then an environmental compensation of Rs. 1500 per ton on such quantity as mis-delivered to unauthorised users or non-delivered to authorised users will be imposed besides prosecution of such non-compliant transporters by State Pollution Control Board (SPCB) of Pollution Control Committee (PCC).
3. Vehicle used for transportation of FlyAsh/Bottom Ash will be equipped with GPS system.

4. The Power Plant shall ensure that fly ash/bottom ash will be filled in areas Khasra No.11/25/4, 11/8 & 11/13, Total Rakba- 7.285 Hect. in Village-Bangurdiya, Tehsil & District-Raigarh (C.G.).
5. The transportation of fly ash/bottom ash shall be fully covered vehicle or by tarpaulin, during lifting of ash from the ash pond to low lying areas/Abandoned mines/Quarries of the concerned village.
6. Proper water sprinkling activities shall be done on haul road and transportation road by dumping of fly ash in the aforesaid areas for mitigation of air pollution.
7. After filling fly ash the low-lying areas shall be covered by 500 mm topsoil.
8. After completion of fly ash filling work in low lying area, Industry shall submit Work-Completion Certificate to Chhattisgarh Environment Conservation Board, Raigarh.
9. Industry shall submit details (quantity of fly ash & bill / of transporation) of fly ash transported to Khasra No.11/25/4, 11/8 & 11/13, Total Rakba- 7.285 Hect. in Village-Bangurdiya, Tehsil & District-Raigarh (C.G.) every 15 days.
10. Industry shall ensure proper wind breaking shield to avoid dust nuisance near by area.
11. M/s Jindal Power Limited, 1400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.) shall have to abide by the guidelines of the Central Government/State Government regarding fly ash utilization issued from time to time.
12. The issuance of this permission does not convey and property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central/State laws or regulations.
13. The above permission shall be revoke, if any conditions are violated by the M/s Jindal Power Limited, 1400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.) with immediate effect.
14. The letter of this office issued via letter no. 2455 dated 22.02.2022 shall be treated cancelled from the date of issue of this letter.

This "Permission" is being issued only for the purpose of ash filling in low-lying areas at aforesaid khasra Nos. mentioned in above and this shall not be treated as consent under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act 1981.

Regional Officer
C.G. Environment Conservation Board, Raigarh

Endt. No. /RO/TS/CECB/2022 Raigarh, Date .....

Copy to :-

1. The Member Secretary, C.G. Environment Conservation Board, Raipur for information please.
2. Collector District – Raigarh for information please.

Regional Officer
C.G. Environment Conservation Board, Raigarh

REGIONAL OFFICE
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD,
T.V. TOWER ROAD, RAIGARH (C.G.)

No. 3455 /RO/TV/CECB/2022 Raigarh, Date 28/04/2022

To,

M/s Jindal Power Limited,
Village- Tamnar, District- Raigarh (C.G.)

Subject :- Permission for filling in low lying areas/Abandoned mines/Quarries with pond ash/Fly Ash.

Ref :- 1. CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low lying Areas and in stowing of Abandoned mines/Quarries.
2. MoEF & CC GOI O.M. No. 22-13/2019-I.A.III dated 28.08.2019.
3. Head Office, Nawa Raipur Atal Nagar Raipur, letter no. 8332 dated 12.12.2020.
4. Collector order letter dated 22.07.2021.
5. Your application dated 06.01.2022.

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With reference to the above, committee formed by Collector Raigarh has examined the proposal in details submitted by you having areas Khasra No.11/25/1, 11/8 & 11/13, Total Rakba- 7.285 Hect. in Village-Bangurjya, Tahsil & District-Raigarh, Permission for filling in low lying areas/Abandoned mines/Quarries with pond ash/Fly Ash in Khasra No.11/25/1, 11/8 & 11/13, Total Rakba- 7.285 Hect. in Village-Bangurjya, Tahsil & District-Raigarh (C.G.) for quantity 40,000 MT subject to the following terms & conditions.

Terms & Conditions :-

1. M/s Jindal Power Limited, 3400 MW Power Plant at Tamnar, Tahsil-Tamnar, District-Raigarh (C.G.), shall have to abide by the CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low Lying areas, industry shall ensure compliance of MoEF & CC GOI O.M. No. 22-13/2019 IA. III Dated 28.08.2019 in case of violation, EC will be imposed to the industry.
2. As per the Fly Ash notification by MOEF & CC dated 31.12.2021 it shall be the responsibility of the transporters of vehicle owner to deliver ash to authorized purchaser or user agency and if it is not complied, then an environmental compensation of Rs. 1500 per ton on such quantity as not delivered to unauthorized users or non-delivered to authorized users will be imposed besides prosecution of such non-compliant transporters by State Pollution Control Board (SPCB) of Pollution Control Committee (PCC).
3. Vehicle used for transportation of Fly Ash/Bottom Ash will be equipped with GPS system.

4. The Power Plant shall ensure that fly ash/bottom ash will be filled in areas khasra No.11/2/1, 11/8 & 11/13, Total Rakba- 7.285 Hect. in Village Bangoriya, Tehsil & District Raigarh (C.G.).
5. The transportation of fly ash/bottom ash shall be fully covered vehicle in the transmit, during lifting of ash from the ash pond to low lying areas/Abandoned mines/Quarries of the concerned village.
6. Industry shall dispose off fly ash/bottom ash only upto current ground level, in case of violation, EC will be imposed to the industry.
7. Proper water sprinkling activities shall be done on haul road and transportation road for dumping of fly ash to the aforesaid areas for mitigation of air pollution.
8. After filling fly ash the low lying areas shall be covered by 300 mm topsoil.
9. After completion of fly ash filling work in low lying area, industry shall submit Work Completion Certificate to Chhattisgarh Environment Conservation Board, Raigarh.
10. Industry shall install appropriate number of piezometers in the proposed fly ash disposal area.
11. Industry shall submit details (quantity of fly ash & lot T (of transportation) of fly ash transported to Khasra No.11/2/1, 11/8 & 11/13, Total Rakba- 7.285 Hect. in Village Bangoriya, Tehsil & District Raigarh (C.G.) every 15 days.
12. Industry shall ensure proper wind breaking sheet to avoid dust nuisance near by area.
13. M/s Jindal Power Limited, 1400 MW Power Plant at Tamnar, Tehsil-Tamnar, District-Raigarh (C.G.) shall have to abide by the guidelines of the Central Government/State Government regarding fly ash utilization issued from time to time.
14. The issuance of this permission does not convey and property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central/State laws or regulations.
15. The above permission shall be revoke, if any conditions are violated by the M/s Jindal Power Limited, 1400 MW Power Plant at Tamnar, Tehsil Tamnar, District-Raigarh (C.G.) with immediate effect.

This "Permission" is being issued only for the purpose of ash filling in low-lying areas of aforesaid Khasra Nos. mentioned in above and this shall not be treated as consent under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act 1981.

Regional Officer
C.G. Environment Conservation Board, Raigarh

Endt. No. /RO(TS)/CECB/2022 Raigarh, Date

Copy To :

1. The Member Secretary, C.G. Environment Conservation Board, Raipur for information please.
2. Collector District – Raigarh for information please.

Regional Officer
C.G. Environment Conservation Board, Raigarh

REGIONAL OFFICE
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD,
T.V. TOWER ROAD, RAIGARH (C.G.)

No. 4052 /RO/TS/CECB/2021 Raigarh, Date 12/8/2021

To,

M/s Jindal Power Limited,
Tamnar, District- Raigarh (C.G.)

Subject :- No Objection Certificate for ash filling in low lying area with pond ash.

Ref :- 1. Suggestion made by committee in O.A. NO. 104/2018 pending under Hon'ble NGT.
2. CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low lying Areas and in stowing of Abandoned mines/Quarries.
3. MoEF & CC GOI O.M. No. 22-13/2019-I.A.III dated 28.08.2019.
4. Head Office, Nawa Raipur Atal Nagar Raipur, letter no. 8332 dated 12.12.2020
5. Collector order letter dated 22.07.2021.
6. Your application no. /PL/EMD/F-18/3400MW/ 2020/109 dated 23.07.2021.

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With reference to the above, committee formed by Collector Raigarh has examined the proposal in details submitted by you having areas Khasra No. 197/1k, 197/1kh, 197/1g, 197/1jh, 197/1chh, 197/1j, Total Rakba- 4.271 Hect. in village- Budia, Khasra No. 253/1k, 252/2, 254, 258, 259, 253/1kh, 253/2, 255/1, 252/3, Total Rakba- 5.155 Hect. in village- Tamnar, Khasra No. 584, 427/1ad, 427/2k, 427/2kh, 418, Total Rakba- 4.03 Hect. in village- Sallabhata and Khasra No. 398, 399, 400, 401, Part of Khasra No. 406 (2.023 Hect.), 393, 394, 395, 396, 397, Total Rakba- 9.913 Hect. in village- Tehlirampur Proposal submitted by you for ash filling in Private land having approximate quantity of 2,00,000 MT. The Regional Office, Raigarh has No Objection for ash filling work in the low-lying areas Situted in Khasra no. 253/1k, 252/2, 254, 258, 259, 253/1kh, 253/2, 255/1, 252/3, Total Rakba- 5.155 Hect. in village- Tamnar, Khasra No. 584, 427/1ad, 427/2k, 427/2kh, 418, Total Rakba- 4.03 Hect. in village- Sallabhata and Part of Khasra No. 406 (2.023 Hect.), 398, 399, 400, 401, 393, 394, 395, 396, 397, Total Rakba- 9.913 Hect. in village- Tehlirampur District-Raigarh (C.G.) subject to the following terms & conditions.

Terms & Conditions :-

1. M/s Jindal Power Limited, 3400 MW Power Plant at Tamnar, District-Raigarh (C.G.), shall have to abide by the CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low Lying areas industry shall ensure compliance of MoEF & CC GOI O.M. No. 22-13/2019-IA. III Dated 28.08.2019.
2. Vehicle used for transportaion of FlyAsh/Bottom Ash will be equipped with GPS system.

3. The Power Plant shall ensure that fly ash/bottom ash will be filled in areas Khasra no. 253/1k, 252/2, 254, 258, 259, 253/1kh, 253/2, 255/1, 252/3, Total Rakba- 5.155 Hect. in village- Tamnar, Khasra No. 584, 427/1ad, 427/2k, 427/2kh, 418, Total Rakba- 4.03 Hect. in village- Saliabhata and part of Khasra No. 406 (2.023 Hec.), 398, 399, 400, 401, 393, 394, 395, 396, 397, Total Rakba- 9.913 Hect. in village- Tehiramuir, District-Raigarh (C.G.)
4. The transportation of fly ash/Bottom ash shall be fully covered vehicle or by tarpaulin, during lifting of ash from the ash pond to low lying areas of the concerned village.
5. Industry shall dispose off fly ash/bottom ash only upto current ground level, if found above ground level EC will be imposed to the industry.
6. Proper water sprinkling activities shall be done on haul road and transportation road by dumping of fly ash in the aforesaid areas for mitigation of air pollution.
7. After filling fly ash the low-lying areas shall be covered by 500 mm topsoil.
8. Industry shall not cut/damage the tree in the land of Khasra no. 584, village- Saliabhata, District-Raigarh (C.G.).
9. After completion of fly ash filling work in low lying area, Industry shall submit Work-Completion Certificate to Chhattigarh Environment Conservation Board, Raigarh.
10. M/s Jindal Power Limited, 3400 MW Power Plant at Tamnar, District-Raigarh (C.G.) Shall have to abide by the guidelines of the Central Covernment/State Government regarding fly ash utilization issued from time to time.
11. The issuance of this NOC does not convey and property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central/State laws or regulations.
12. The above NOC shall be revoke, if any conditions are violated by the M/s Jindal Power Limited, 3400 MW Power Plant at Tamnar, District-Raigarh (C.G.) with immediate effect.

This "No Objection Certificate" is being issued only for the purpose of ash filling in low-lying areas of aforesaid Khasra Nos. mentiones in above and this shall not be treated as consent under Water (Prevention and Contorl of Pollution) Act, 1974 and Air (Prevention and Contorl of Pollution) Act 1981.

Regional Officer
Raigarh, Date _____

Endt. No. /RO/TS/CECB/2021

Copy To –

1. The Member Secretary, C.G. Environment Conservation Board, Raipur for information please.
2. Collector, Raigarh, District – Raigarh for information please.

Regional Officer
C.G. Environment Conservation Board,
Raigarh (C.G.)

(9)

REGIONAL OFFICE
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD,
T.V. TOWER ROAD, RAIGARH (C.G.)

No. 1961 /RO/TS/CECB/2021 Raigarh, Date 1/10/21

To,

M/s Jindal Power Ltd.,
Tamnar, District- Raigarh (C.G.)

Subject :- No Objection Certificate for ash filling in low lying area/in stowing of Abandoned mines/Quarries with pond ash/Fly Ash.

Ref:- 1. CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low lying Areas and in stowing of Abandoned mines/Quarries.
2. MoEF & CC GOI O.M. No. 22-13/2019-I.A.III dated 28.08.2019.
3. Head Office, Nawa Raipur Atal Nagar Raipur, letter no. 8332 dated 12.12.2020
4. Collector order letter dated 22.07.2021.
5. Your application dated 28.09.2021.

——00——

With reference to the above, commitee formed by Collector Raigarh has examined the proposal in details submitted by you having areas Khasra No. 274, 276, 277, 279, 291, 293, 294, 295, 296 & 278, Total Rakba- 4.680 Hect. in Village-Tehlirampur, Tamnar. Proposal submitted by you for ash filling in Private land the Regional Office, Raigarh has No Objection for ash filling work in the low-lying areas/ Abandoned mines/Quarries situted in Khasra No. 274, 276, 277, 279, 291, 293, 294, 295, 296 & 278, Total Rakba- 4.680 Hect. in Village-Tehlirampur, Tamnar, District-Raigarh (C.G.) for quantity 1,00,000 MT subject to the following terms & conditions.

Terms & Conditions :-

1. M/s Jindal Power Ltd. 3400 MW Power Plant at Tamnar, District- Raigarh (C.G.) shall have to abide by the CPCB Guidelines for disposal/utilization of fly ash for reclamation of Low Lying areas industry shall ensure compliance of MoEF & CC GOI O.M. No. 22-13/2019-IA. III Dated 28.08.2019 in case of violation, EC will be imposed to the industry.
2. Vehicle used for transportation of FlyAsh/Bottom Ash will be equipped with GPS system.
3. The Power Plant shall ensure that fly ash/bottom ash will be filled in areas Khasra No. 274, 276, 277, 279, 291, 293, 294, 295, 296 & 278, Total Rakba- 4.680 Hect. in Village-Tehlirampur, Tamnar, District-Raigarh (C.G.).
4. The transportation of fly ash/Bottom ash shall be fully covered vehicle or by Tarpaulin, during lifting of ash from the ash pond to low lying areas/Abandoned mines/Quarries of the concerned village.

(10)

5. Industry shall dispose off fly ash/bottom ash only upto current ground level, in case of violation, EC will be imposed to the industry.
6. Proper water sprinkling activities shall be done on haul road and transportation road by dumping of fly ash in the aforesaid areas for mitigation of air pollution.
7. After filling fly ash the low-lying areas shall be covered by 500 mm topsoil.
8. After completion of fly ash filling work in low lying area, industry shall submit Work Completion Certificate to Chhattigarh Environment Conservation Board, Raigarh.
9. Industry shall install appropriate No. of piezometers in the proposed fly ash disposal area.
10. Industry shall not cut/damage the tree in the proposed land of village- Tehlirampur, Tamnar, District-Raigarh (C.G.)
11. Industry shall submit details (Quantity of fly ash & Rill T of transportation) of fly ash transported to Khasra No. 274, 276, 277, 279, 281, 293, 294, 295, 296 & 278, Total Rakba- 4.880 Hect. in Village-Tehlirampur, Tamnar, District-Raigarh (C.G.) every 15 days.
12. M/s Jindal Power Ltd. at Tamnar, District- Raigarh (C.G.) shall have to abide by the guidelines of the Central Government/State Government regarding fly ash utilization issued from time to time.
13. The issuance of this NOC does not convey and property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central/State laws or regulations.
14. The above NOC shall be revoke, if any conditions are violated by the M/s Jindal Power Ltd. at Tamnar, District- Raigarh (C.G.) with immediate effect.

This "No Objection Certificate" is being issued only for the purpose of ash filling in low-lying areas of aforesaid Khasra Nos. mentioned in above and this shall not be treated as consent under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act 1981.

Regional Officer
C.G. Environment Conservation Board,
Raigarh (C.G.)
Raigarh, Date 11/5/21

d/c

Endt. No. 1664 /RO/TS/CECB/2021

Copy To :-

1. The Member Secretary, C.G. Environment Conservation Board, Raipur for information please.
2. Collector District – Raigarh for information please.

Regional Officer
C.G. Environment Conservation Board,
Raigarh (C.G.)

d/c

Jindal Power Limited, Tamnar

Annexure-8

AMBIENT AIR QUALITY MONITORING DATA FOR THE MONTH OF OCTOBER 2022

Date	Location-1					Location-2					Location-3					Location-4				
	New Switch Yard					Near Hostel 5					Savitrinagar Colony (Tehlirampur village)					Tamnar village				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					0.5					5.0					3.0				
Direction (w.r.t stack)	NW					ESE					ENE					S				
03.10.2022	38.7	NA	NA	25.8	0.52	NA	NA	NA	NA	NA	NA	19.5	11.7	23.8	0.33	49.7	NA	13.8	27.5	0.78
06.10.2022	42.3	NA	NA	26.7	0.54	NA	NA	16.4	26.8	0.52	NA	17.6	12.3	24.8	0.46	49.5	NA	14.5	27.4	0.66
10.10.2022	40.2	17.6	14.2	26.3	0.55	NA	NA	13.5	27.4	NA	64.1	16.5	12.3	25.1	0.35	49.6	NA	12.5	27.6	0.53
13.10.2022	46.3	16.5	14.4	27.8	0.52	NA	NA	19.6	28.2	NA	58.4	17.6	13.2	24.8	0.42	54.6	NA	14.2	27.4	0.63
17.10.2022	40.4	14.3	15.1	28.5	0.58	NA	NA	NA	NA	NA	NA	18.2	12.1	23.2	0.45	52.6	NA	11.5	25.7	0.68
20.10.2022	43.1	14.7	16.5	27.7	0.56	NA	NA	NA	NA	NA	67.8	20.5	11.7	23.8	0.43	53.3	NA	13.4	26.6	0.73
24.10.2022	36.4	14.2	14.5	28.6	0.57	NA	NA	NA	NA	NA	45.1	16.6	13.3	29.3	0.63	49.6	17.8	16.8	28.2	0.74
27.10.2022	38.3	17.5	13.8	27.1	0.53	48.6	18.2	17.8	26.7	0.59	55.6	19.4	12.5	23.6	0.41	48.7	15.8	13.2	26.2	0.62
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Date	Location-5					Location-6					Location-7					Location-8				
	JIPT Building					Gorhi village					Regaon village					Nirman Bhavan				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					4.5					3.0					0.2				
Direction (w.r.t stack)	W					SSW					N					S				
03.10.2022	54.5	18.6	16.3	28.3	0.65	38.7	15.6	13.2	27.5	0.64	33.4	16.4	9.3	24.8	0.55	50.6	16.2	15.8	24.8	0.55
06.10.2022	58.6	20.1	15.4	26.8	0.57	48.6	18.7	14.4	27.9	0.68	54.3	17.7	8.7	24.7	0.56	55.4	17.6	16.2	25.2	0.62
10.10.2022	60.7	21.6	18.2	29.3	0.59	52.4	18.3	14.8	27.2	0.66	52.8	19.3	9.7	25.6	0.47	58.7	18.2	15.3	25.6	0.57
13.10.2022	65.3	23.4	17.3	27.8	0.64	57.7	21.3	15.4	27.7	0.65	56.7	16.4	9.5	26.3	0.53	61.3	21.6	17.1	26.7	0.63
17.10.2022	60.4	20.8	15.6	26.5	0.63	56.3	21.7	15.3	28.3	0.72	53.3	18.5	10.2	25.2	0.56	57.6	19.8	15.9	25.9	0.65
20.10.2022	63.3	22.5	14.8	28.4	0.67	55.7	22.1	14.6	27.6	0.67	52.4	17.5	9.7	24.9	0.54	65.4	24.1	18.3	28.4	0.67
24.10.2022	66.2	24.6	15.7	27.5	0.62	52.3	16.4	13.6	28.5	0.74	50.6	15.4	12.4	27.2	0.78	63.8	22.7	17.2	27.3	0.64
27.10.2022	62.4	23.2	14.6	26.3	0.64	52.8	21.5	14.5	27.4	0.66	56.4	17.5	12.9	25.3	0.66	64.7	23.3	17.5	26.8	0.61
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Note: All Units in $\mu g/m^3$ except CO (in mg/m^3)

NA* analyzer under maintenance.

Annexure-II

AMBIENT AIR QUALITY MONITORING DATA FOR THE MONTH OF NOVEMBER,2022

Date	Location-1					Location-2					Location-3					Location-4				
	New Switch Yard					Near Hostel-5					Savitrinagar Colony (Tehsirampur village)					Tamnar village				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					0.5					5.0					3.0				
Direction (w.r.t stack)	NW					ESE					ENE					S				
03.11.2022	46.2	20.3	13.4	28.4	0.5	55.3	19.5	18.7	27.6	0.57	52.7	17.3	12.9	26.4	0.47	55.1	18.8	11.4	26.2	0.72
07.11.2022	46.8	22.5	14.1	28.2	0.6	60.4	24.3	17.7	27.5	0.58	NA	18.8	12.6	23.6	0.49	50.1	18.6	14.6	26.1	0.68
10.11.2022	50.5	24.4	13.2	28.7	0.5	63.2	26.3	19.4	28.6	0.64	51.6	18.5	11.1	24.2	0.48	49.2	19.1	11.5	26.7	0.62
14.11.2022	49.6	22.8	14.4	25.8	0.6	57.1	21.4	16.4	27.6	0.62	54.7	14.4	9.8	26.1	0.41	55.7	18.1	14.2	28.6	0.69
17.11.2022	55.8	28.6	14.7	28.4	0.6	62.3	23.2	14.3	26.4	0.61	54.6	15.3	10.6	25.2	0.37	47.4	19.6	13.8	26.6	0.66
21.11.2022	57.1	29.5	17.1	28.8	0.6	67.1	18.3	15.4	27.6	0.51	55.8	16.7	9.6	24.6	0.43	45.2	19.1	15.2	27.1	0.69
24.11.2022	50.2	23.2	13.2	27.6	0.5	61.6	27.7	16.3	27.1	0.52	62.3	18.3	13.3	24.8	0.52	48.4	17.4	15.6	27.2	0.68
28.11.2022	59.1	24.1	15.4	28.3	0.6	65.2	23.2	18.8	26.9	0.54	NA	19.3	14.7	25.5	0.63	48.6	25.3	12.9	29.1	0.77
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Date	Location-5					Location-6					Location-7					Location-8				
	JIPT Building					Gorhi village					Regaon village					Nirman Bhavan				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					4.5					3.0					0.2				
Direction (w.r.t stack)	W					SSW					N					S				
03.11.2022	58.6	23.6	13.2	26.6	0.56	56.4	21.7	16.5	27.3	0.69	59.7	18.3	12.3	25.8	0.63	64.2	25.4	16.3	28.6	0.59
07.11.2022	62.3	25.5	15.4	27.8	0.57	60.6	21.4	15.5	27.8	0.67	55.6	19.4	14.4	25.6	0.54	68.3	26.7	15.8	28.4	0.56
10.11.2022	60.4	24.3	14.4	26.7	0.66	64.2	24.1	16.1	28.3	0.65	62.4	18.2	11.8	24.7	0.66	62.3	25.2	16.1	27.6	0.63
14.11.2022	56.5	22.1	12.8	28.1	0.64	56.4	21.5	14.3	28.4	0.66	63.3	24.7	10.6	25	0.77	58.6	23.1	15.4	28.4	0.65
17.11.2022	54.8	20.6	12.2	27.5	0.59	58.4	21.2	15.2	28.2	0.56	52.4	22.6	12.2	25.3	0.66	56.7	22.8	13.9	26.8	0.61
21.11.2022	52.6	18.6	11.8	26.4	0.61	63.5	24.1	15.7	27.6	0.68	74.5	24.2	14.7	23.3	0.71	50.8	21.7	15.2	28.2	0.54
24.11.2022	65.3	26.4	15.6	28.7	0.58	62.7	24.4	15.9	26.7	0.69	64.2	26.2	12.6	24.8	0.72	53.6	21.2	14.5	27.4	0.53
28.11.2022	60.1	22.3	14.3	27.6	0.63	54.8	20.4	14.8	27.9	0.68	64.7	25.3	12.3	25.6	0.64	59.4	22.6	15.4	26.3	0.57
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Note: All Units in $\mu g/m^3$ except CO (in mg/m^3)

NA* analyser under maintenance

AMBIENT AIR QUALITY MONITORING DATA FOR THE MONTH OF DECEMBER,2022

Date	Location-1					Location-2					Location-3					Location-4				
	New Switch Yard					Near Hostel 5					Savitrinagar Colony (Tehlirampur village)					Tamnar village				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					0.5					5.0					3.0				
Direction (w.r.t stack)	NW					ESE					ENE					S				
01.12.2022	59.7	21.7	14.6	28.4	0.55	58.2	23.2	18.5	27.6	0.54	49.9	13.7	12.6	24.5	0.54	48.7	22.8	13.1	29.3	0.69
05.12.2022	64.6	24.6	11.6	28.8	0.57	61.6	26.5	17.8	28.4	0.68	54.5	15.5	13.2	24.6	0.29	NA	NA	NA	NA	NA
08.12.2022	64.5	33.3	13.6	NA	0.54	70.1	28.3	20.2	29.3	0.67	61.2	17.7	13.7	25.6	0.64	NA	NA	NA	NA	NA
12.12.2022	63.8	25.8	12.8	28.3	0.47	65.8	29.1	16.5	28.6	0.64	47.8	21.6	11.3	25.7	0.56	NA	NA	NA	NA	NA
15.12.2022	62.6	22.5	13.3	29.7	0.65	NA	NA	NA	NA	NA	55.1	22.2	12.6	27.1	0.54	64.2	21.6	14.4	29.4	0.66
19.12.2022	56.2	25.6	13.7	28.4	0.66	63.4	31.5	14.8	28.8	0.64	64.5	24.8	14.3	26.7	0.51	63.1	23.7	13.7	27.8	0.65
22.12.2022	54.4	25.1	14.5	28.6	0.57	50.4	24.8	17.2	28.5	0.71	NA	22.1	12.7	26.1	0.36	56.3	20.4	13.3	27.7	0.53
26.12.2022	51.5	24.1	12.8	29.4	0.68	59.6	26.7	16.5	27.8	0.63	59.6	16.4	13.5	27.3	0.37	62.4	23.8	14.6	27.4	0.67
29.12.2022	62.1	26.3	14.7	29.2	0.59	66.5	29.4	15.3	28.1	0.67	61.5	15.1	14.7	24.8	0.53	55.3	15.4	13.2	26.8	0.43
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Date	Location-5					Location-6					Location-7					Location-8				
	JIPT Building					Gorhi village					Regaon village					Nirman Bhavan				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					4.5					3.0					0.2				
Direction (w.r.t stack)	W					SSW					N					S				
01.12.2022	58.6	23.7	13.7	25.6	0.66	63.2	23.2	15.4	29.2	0.67	64.3	25.8	13.5	24.8	0.69	62.3	26.5	13.6	29.1	0.56
05.12.2022	54.7	22.4	14.5	27.5	0.61	61.4	23.6	14.3	28.2	0.58	60.5	28	12.7	25.4	0.66	60.7	26.1	14.5	28.6	0.58
08.12.2022	62.4	25.3	13.6	26.5	0.59	NA	NA	NA	NA	NA	68.2	27.5	14.6	25.8	0.68	58.4	25.2	12.8	27.8	0.63
12.12.2022	60.2	26.4	15.3	28.3	0.58	58.5	20.3	13.4	27.8	0.64	64.5	23.4	13.4	25.3	0.65	56.4	24.3	15.3	26.4	0.64
15.12.2022	63.7	24.8	12.7	27.4	0.53	60.8	21.5	14.1	28.6	0.66	55.7	23.2	14.3	23.9	0.67	61.7	28.1	13.2	27.6	0.68
19.12.2022	60.8	23.6	13.8	28.3	0.57	56.7	19.6	12.7	27.4	0.62	65.3	25.7	15.5	26.4	0.58	64.5	27.6	14.1	28.2	0.59
22.12.2022	59.7	23.2	16.3	26.4	0.64	NA	NA	NA	NA	NA	65.6	25.2	NA	23.7	0.56	57.8	24.3	15.6	26.8	0.57
26.12.2022	64.5	25.4	14.2	26.3	0.63	NA	NA	NA	NA	NA	NA	30.6	13.7	24.5	0.73	55.4	23.4	14.7	27.4	0.63
29.12.2022	57.8	22.7	15.3	27.4	0.67	NA	NA	NA	NA	NA	57.4	26.4	13.4	23.8	0.64	60.3	25.6	16.2	28.6	0.64
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Note: All Units in $\mu g/m^3$ except CO (in mg/m^3)

NA* analyzer under maintenance

Jindal Power Limited, Tamnar

Annexure-8

AMBIENT AIR QUALITY MONITORING DATA FOR THE MONTH OF JANUARY, 2023

Date	Location-1 New Switch Yard					Location-2 Near Hostel S					Location-3 Savitrinagar Colony (Tehlirampur village)					Location-4 Tamnar village				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					0.5					5.0					3.0				
Direction (w.r.t stack)	NW					ESE					ENE					S				
02.01.2023	53.5	24.5	12.4	29.4	0.57	62.4	26.8	14.3	28.7	0.57	48.6	16.8	11.5	23.6	0.38	66.6	25.3	12.4	28.7	0.65
05.01.2023	60.3	28.8	14.2	28.1	0.63	69.3	25.5	15.8	27.8	0.72	51.5	20.2	12.3	24.4	0.39	60.7	23.6	13.5	27.4	0.54
09.01.2023	59.6	20.6	35.1	27.6	0.74	62.7	NA	19.2	28.2	0.47	NA	14.5	13.1	25.1	0.41	61.5	22.8	14.1	27.7	0.62
12.01.2023	66.8	26.1	14.5	28.8	0.65	68.3	NA	15.7	28.4	0.63	59.1	20.7	14.1	24.7	0.48	65.6	23.5	14.5	28.5	0.64
16.01.2023	68.7	23.5	15.2	28.7	0.67	70.7	NA	14.8	29.2	0.67	60.5	23.3	12.2	23.3	0.37	64.4	21.4	12.6	27.7	0.69
19.01.2023	58.8	22.7	17.1	25.3	0.64	68.4	30.4	16.2	27.5	0.64	56.7	17.5	16.2	26.5	0.43	65.9	22.7	13.2	28.5	0.63
23.01.2023	67.4	24.3	15.6	27.8	0.62	56.6	NA	15.4	28.3	0.63	52.6	20.6	15.5	25.6	0.63	59.2	19.3	13.6	26.8	0.66
26.01.2023	58.8	25.4	14.2	26.5	0.69	65.7	25.6	16.5	27.8	0.67	NA	22.3	14.3	25.7	0.46	64.6	23.6	16.3	27.2	0.68
30.01.2023	70.5	27.3	14.3	28.2	0.66	63.6	28.4	16.2	27.7	0.66	58.6	24.2	15.7	26.8	0.37	68.3	26.7	15.2	28.6	0.67
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Date	Location-5 JIPT Building					Location-6 Gorhi village					Location-7 Regaon village					Location-8 Nirman Bhavan				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					4.5					3.0					0.2				
Direction (w.r.t stack)	W					SSW					N					S				
02.01.2023	65.2	25.3	14.6	28.6	0.69	NA	NA	NA	NA	NA	52.8	17.6	12.3	25.4	0.68	63.8	23.2	13.4	26.6	0.65
05.01.2023	62.8	23.4	13.7	27.7	0.67	58.6	23.5	13.8	26.7	0.62	65.4	24.6	11	24.8	0.76	65.7	24.8	13.8	28.4	0.63
09.01.2023	58.6	21.6	12.8	26.3	0.64	63.5	25.4	15.2	28.3	0.67	52.5	13.3	14.3	27.7	0.62	62.6	22.9	14.6	26.8	0.59
12.01.2023	64.5	24.1	14.2	27.4	0.68	NA	NA	NA	NA	NA	57.6	12.6	14	27.6	0.78	68.4	26.4	15.7	28.7	0.58
16.01.2023	68.4	26.4	15.3	28.8	0.72	NA	NA	NA	NA	NA	NA	15.7	13.6	27.5	0.67	72.5	28.6	16.3	29.4	0.67
19.01.2023	72.3	27.6	16.8	29.4	0.69	68.4	27.6	16.3	29.2	0.72	51	21.8	16.6	NA	0.72	70.4	27.5	15.8	29.2	0.72
23.01.2023	66.4	25.3	15.2	27.3	0.58	65.8	24.8	15.6	28.4	0.68	66.3	24.7	14.4	28.6	0.67	68.3	26.4	13.5	28.5	0.75
26.01.2023	63.7	23.6	14.5	26.7	0.64	NA	NA	NA	NA	NA	57.6	16.3	14.7	26.8	0.65	65.7	24.7	14.6	27.6	0.69
30.01.2023	61.3	22.7	13.6	25.8	0.66	64.2	23.7	14.8	28.2	0.65	60.7	16.6	20.6	26.2	0.63	66.3	25.3	15.3	27.8	0.66
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Note: All Units in $\mu g/m^3$ except CO (in mg/m^3)

NA* analyser under maintenance.

Jindal Power Limited, Tamnar

Annexure-8

AMBIENT AIR QUALITY MONITORING DATA FOR THE MONTH OF FEBRUARY, 2023

Date	Location-1					Location-2					Location-3					Location-4				
	New Switch Yard					Near Hostel 5					Savitrinagar Colony (Tehlirampur village)					Tamnar village				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					0.5					5.0					3.0				
Direction (w.r.t stack)	NW					ESE					ENE					S				
02.02.2023	66.4	20.2	15.7	28.6	0.68	63.4	22.3	15.4	28.1	0.58	56.8	19.7	14.2	24.3	0.57	57.6	18.6	13.6	29.1	0.75
06.02.2023	65	21.3	13.8	28.2	0.59	65.6	23.7	16.3	28.5	0.67	50.8	19.3	13.6	23.4	0.48	65.2	21.3	15.2	28.5	0.58
09.02.2023	63.5	20.1	17.3	27.6	0.64	55.5	22.3	15.7	28.2	0.55	61.1	20.5	15.3	25.6	0.55	60.4	19.6	15.1	28.3	0.67
13.02.2023	55.1	22.2	15.4	27.3	0.63	63.7	24.5	17.3	27.8	0.43	56.4	18.6	17.1	26.4	0.43	58.3	18.5	13.8	28.4	0.66
16.02.2023	61.6	21.8	15.5	26.4	0.67	64.1	22.5	14.3	27.5	0.52	49.5	17.3	16.5	25.7	0.39	61.5	19.3	14.5	27.8	0.48
20.02.2023	66.3	29.7	15.3	26.8	0.64	61.5	24.1	17.1	28.2	0.65	64.7	23.7	14.2	26.3	0.46	69.3	22.5	14.7	29.1	0.73
23.02.2023	63.6	25.4	13.5	28.5	0.59	56.6	NA	15.8	27.4	0.74	NA	21.8	13.1	26.5	0.41	62.3	21.8	15.2	27.8	0.56
27.02.2023	66.4	26.6	13.8	NA	0.64	NA	NA	16.5	28.8	0.42	NA	21.7	13.5	24.2	0.47	NA	NA	NA	NA	NA
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2
Date	Location-5					Location-6					Location-7					Location-8				
	JIPT Building					Gorhi village					Regaon village					Nirman Bhavan				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					4.5					3.0					0.2				
Direction (w.r.t stack)	W					SSW					N					S				
02.02.2023	65.3	23.2	16.5	28.6	0.66	62.3	23.2	16.2	28.4	0.65	54.4	16.6	13.4	27.2	0.52	66.4	25.3	16.8	29.5	0.65
06.02.2023	62.4	21.8	15.4	28.4	0.62	NA	NA	NA	NA	NA	60.8	21.7	13.1	28.6	0.56	62.7	23.1	16.2	28.7	0.63
09.02.2023	58.7	18.6	15.2	27.5	0.58	65.5	24.1	14.8	29.3	0.68	60.6	15.8	13.5	27.6	0.53	60.5	20.4	15.8	28.2	0.61
13.02.2023	60.8	20.1	14.6	27.2	0.61	63.4	21.5	15.4	28.3	0.64	61.7	16.3	13	26.6	0.54	59.3	18.6	15.6	27.8	0.67
16.02.2023	56.4	16.8	13.8	26.7	0.57	NA	NA	NA	NA	NA	53.8	13.2	13.2	27.5	0.66	57.4	17.7	14.7	27.3	0.61
20.02.2023	53.6	17.2	14.1	26.4	0.55	NA	NA	NA	NA	NA	54.6	15.7	13.5	26.8	0.62	63.5	23.6	16.4	28.6	0.62
23.02.2023	61.2	18.4	15.5	27.3	0.63	60.8	20.3	16.2	29.4	0.72	55.1	15.2	12.1	25.6	0.53	61.5	22.3	15.7	27.6	0.58
27.02.2023	63.8	19.6	16.3	28.2	0.65	58.6	19.4	15.5	28.7	0.67	57.4	21.5	12.6	24.8	0.44	65.3	24.2	16.2	28.3	0.56
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Note: All Units in $\mu g/m^3$ except CO (in mg/m^3)

NA* analyzer under maintenance.

Jindal Power Limited, Tamnar

Annexure-8

AMBIENT AIR QUALITY MONITORING DATA FOR THE MONTH OF MARCH, 2023

Date	Location-1					Location-2					Location-3					Location-4				
	New Switch Yard					Near Hostel 5					Savitrinagar Colony (Tehlirampur village)					Tamnar village				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					0.5					5.0					3.0				
Direction (w.r.t stack)	NW					ESE					ENE					S				
02.03.2023	59.4	24.3	15.8	27.8	0.62	60.4	23.2	16.4	28.6	0.56	52.6	20.3	13.2	25.3	0.45	63.7	22.4	14.6	28.6	0.57
06.03.2023	61.3	23.2	13.8	28.6	0.61	66.4	28.7	16.4	28.3	0.52	53.8	18.1	13.1	24.7	0.54	NA	NA	NA	NA	NA
09.03.2023	59.8	19.3	12.7	28.4	0.66	59.3	19.5	13.1	27.5	0.46	55.4	18.5	12.2	24.3	0.51	65.3	23.2	15.3	27.8	0.64
13.03.2023	57.7	20.1	14.7	28.3	0.67	62.8	30.3	16.4	28.4	0.62	62.5	25.1	15.2	25.4	0.48	NA	NA	NA	NA	NA
16.03.2023	62.7	21.8	13.8	28.8	0.63	62.5	22.6	17.4	29.3	0.52	62.2	25.4	15.1	24.4	0.64	62.5	22.6	11.8	28.4	0.65
20.03.2023	34.1	9.8	13.1	27.4	0.56	NA	NA	NA	NA	NA	39.5	11.9	11.7	25.2	0.63	NA	NA	NA	NA	NA
23.03.2023	62.2	18.3	15.2	28.8	0.73	NA	NA	NA	NA	NA	55.8	15.2	16.9	25.6	0.36	54.7	15.8	14.6	28.2	0.54
27.03.2023	55.7	14.4	12.4	28.9	0.66	52.7	21.7	16.3	29.7	0.47	58.1	20.5	12.2	23.8	0.41	50.5	16.6	12.4	25.7	0.53
30.03.2023	64.6	27.8	13.2	28.6	0.69	56.1	18.8	16.3	28.6	0.53	56.3	21.7	13.2	24.5	0.54	54.8	18.3	13.2	26.8	0.58
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Date	Location-5					Location-6					Location-7					Location-8				
	JIPT Building					Gorhi village					Regaon village					Nirman Bhavan				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Distance (KM) (w.r.t stack)	0.2					4.5					3.0					0.2				
Direction (w.r.t stack)	W					SSW					N					S				
02.03.2023	56.8	18.6	13.6	27.4	0.56	65.4	24.5	15.3	28.6	0.62	58.6	18.4	12.3	26.8	0.54	58.6	19.4	15.3	27.5	0.66
06.03.2023	62.3	22.6	14.5	28.7	0.62	60.8	21.6	14.6	28.7	0.68	NA	NA	NA	NA	NA	65.3	23.6	17.4	29.4	0.68
09.03.2023	58.7	19.4	15.2	28.2	0.64	NA	NA	NA	NA	NA	53.7	16.7	12.2	26.4	0.52	60.5	20.3	15.7	28.7	0.72
13.03.2023	60.4	20.3	13.8	27.6	0.68	58.6	18.7	13.8	27.6	0.61	50.8	15.6	11.7	25.3	0.48	63.4	22.1	16.2	29.3	0.64
16.03.2023	65.3	25.4	14.6	29.3	0.64	56.2	17.5	13.2	27.3	0.63	NA	NA	NA	NA	NA	68.2	28.7	18.3	30.4	0.74
20.03.2023	63.4	23.6	15.2	28.5	0.58	NA	NA	NA	NA	NA	57.6	14.7	12.6	26.2	0.45	66.4	26.4	16.4	29.6	0.69
23.03.2023	59.4	20.1	14.2	26.7	0.63	54.8	16.7	12.9	26.7	0.66	52.4	14.2	12.1	25.8	0.43	60.7	23.1	15.3	27.9	0.75
27.03.2023	61.5	21.3	13.5	27.6	0.67	NA	NA	NA	NA	NA	55.5	15.3	11.7	26.5	0.47	63.4	24.3	16.1	28.6	0.67
30.03.2023	63.2	22.5	13.7	28.2	0.69	62.3	20.3	13.6	28.4	0.64	NA	NA	NA	NA	NA	65.6	25.5	16.5	28.3	0.65
Permissible Limits	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2	100	60	80	80	2

Note: All Units in $\mu g/m^3$ except CO (in mg/m^3)

NA* analyzer under maintenance.

Ultimate
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099
Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1996

Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Report No	UES/TR/22-23/05144	
	Lab Ref No.	UES/22-23/AAQM/011677-011680	
	Date Of Sampling	22/11/2022	
	Date Of Receipt	23/11/2022	
	Date Of Report	28/11/2022	
	Date Of Analysis	Start:23/11/2022	End:28/11/2022

SAMPLE DETAILS

Monitoring For	Ambient Air Quality Monitoring		
Sampling Location	1. Switch Yard	Latitude	22.11501
		Longitude	83.45584
	2. Shakti Vihar (Regaon)	Latitude	22.11102
		Longitude	83.45076
	3. JIPT Building	Latitude	22.10586
		Longitude	83.44494
	4. Nirman Bhawan	Latitude	22.09643
		Longitude	83.45139
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Duration Of Sampling	As per CPCB norms		
Sample Collected By	Laboratory Chemist		
Sampling Procedure	As Per Method Reference		
Sample Quantity/Packing	Filter Paper (PM_{10}): 1X1 No., Filter Paper ($PM_{2.5}$): 1X1 No. SO_2: 30mlX1 No. PVC Bottle, NO_2: 30mlX1 NO. PVC Bottle, Rubber Bladder: 1X1 No.		

TEST REPORT

PARAMETER	UNIT	METHOD REFERENCE	NAAQM STANDARD	RESULT			
				Switch Yard	Shakti Vihar (Regaon)	JIPT Building	Nirman Bhawan
Particulate Matter size less than 10 microns (PM_{10})	µg/m³	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100	57	61	68	63
Particulate Matter size less than 2.5 microns ($PM_{2.5}$)	µg/m³	CPCB Guidelines Vol.-I.	60	29	32	35	30
Sulphur Dioxide (SO_2)	µg/m³	IS 5182 (Part 2) 2001, RA 2006 &CPCB Guidelines Vol.-I	80	16	18	17	14
Nitrogen Dioxide (NO_2)	µg/m³	IS 5182 (Part 6) 2006 & CPCB Guidelines Vol.-I	80	24	21	23	26
Carbon Monoxide (CO) *	mg/m³	IS 5182(Part 10):1999, RA 2003	4.0	0.8	1.0	0.8	0.9
Lead (Pb)	µg/m³	CPCB Guidelines Vol-I and AAS Method	1.0	N.D.	N.D.	N.D.	N.D.
Nickel (Ni)	ng/m³	CPCB Guidelines Vol-I and AAS Method	20	N.D.	N.D.	N.D.	N.D.
Arsenic (As)	ng/m³	CPCB Guidelines Vol-I and AAS Method	6.0	N.D.	N.D.	N.D.	N.D.
Mercury (as Hg)	ng/m³	CPCB Guidelines Vol-I and AAS Method	-	N.D.	N.D.	N.D.	N.D.
Ozone (O_3) *	µg/m³	CPCB Guidelines Vol-I	180	20	14	15	13
Ammonia (NH_3)	µg/m³	CPCB Guidelines Vol-I	400	17.8	13.9	12.7	14.7
Benzene (C_6H_6)	µg/m³	IS 5182(Part 11):2006	5.0	N.D.	N.D.	N.D.	N.D.
Benzo(a)Pyrene	ng/m³	IS 5182 (Part 12): 2014	1.0	N.D.	N.D.	N.D.	N.D.

REMARKS: * These results are on the basis of 1 hour sampling.

Terms & conditions
- The report for publication, arbitration or as legal dispute is not
- Test sample will be retained for 07 days after issue of test report unless agreed with customer.
- This is for information of the party has asked for above

28/11/2022
PREPARED BY

ULTIMATE ENVIROLYTICAL SOLUTIONS HDD-272, Phase-I, Near Magnet, Raipur (C.G.) 492001

For ULTIMATE ENVIROLYTICAL SOLUTIONS

AUTHORIZED SIGNATORY

End of the test report

Ultimate
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099
Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

Name & Address Of The Customer			
To, **Jindal Power Limited** **P.O. Tamnar,** **District: Raigarh** **496107 (C.G.)**	Report No.	UES/TR/22-23/05145	
	Lab Ref No.	UES/22-23/AAQM/011681-011684	
	Date Of Sampling	22/11/2022	
	Date Of Receipt	23/11/2022	
	Date Of Report	28/11/2022	
	Date Of Analysis	Start:23/11/2022	End:28/11/2022

SAMPLE DETAILS

Monitoring For	Ambient Air Quality Monitoring		
Sampling Location	1. Hostel No. 05	Latitude Longitude	22.111118 83.461405
	2. Savitri Nagar	Latitude Longitude	22.13289 83.46240
	3. Tamnar	Latitude Longitude	83.45339 22.11169
	4. Gorhi	Latitude Longitude	83.46087 22.07870 83.42353
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Duration Of Sampling	As per CPCB norms		
Sample Collected By	Laboratory Chemist		
Sampling Procedure	As Per Method Reference		
Sample Quantity/Packing	Filter Paper (PM_{10}) : 1X1 No., Filter Paper ($PM_{2.5}$) : 1X1 No. SO_2: 30mlX1 No. PVC Bottle, NO_2: 30mlX1 NO. PVC Bottle, Rubber Bladder: 1X1 No.		

TEST REPORT

PARAMETER	UNIT	METHOD REFERENCE	NAAQM STANDARD	RESULT			
				Hostel No. 05	Savitri Nagar	Tamnar	Gorhi
Particulate Matter size less than 10 microns (PM_{10})	µg/m³	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100	64	61	63	77
Particulate Matter size less than 2.5 microns ($PM_{2.5}$)	µg/m³	CPCB Guidelines Vol.-I.	60	35	34	30	37
Sulphur Dioxide (SO_2)	µg/m³	IS 5182 (Part 2): 2001, RA 2006 &CPCB Guidelines Vol.-I	80	13	12	14	12
Nitrogen Dioxide (NO_2)	µg/m³	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80	22	20	26	23
Carbon Monoxide (CO)*	mg/m³	IS 5182(Part 10):1999, RA 2003	4.0	0.7	0.9	0.8	0.6
Lead (Pb)	µg/m³	CPCB Guidelines Vol-I and AAS Method	1.0	N.D.	N.D.	N.D.	N.D.
Nickel (Ni)	ng/m³	CPCB Guidelines Vol-I and AAS Method	20	N.D.	N.D.	N.D.	N.D.
Arsenic (As)	ng/m³	CPCB Guidelines Vol-I and AAS Method	6.0	N.D.	N.D.	N.D.	N.D.
Mercury (as Hg)	ng/m³	CPCB Guidelines Vol-I and AAS Method	-	N.D.	N.D.	N.D.	N.D.
Ozone (O_3)*	µg/m³	CPCB Guidelines Vol-I	180	21	19	16	20
Ammonia (NH_3)	µg/m³	CPCB Guidelines Vol-I	400	15.2	12.4	14.2	13.6
Benzene (C_6H_6)	µg/m³	IS 5182 (Part 11):2006	5.0	N.D.	N.D.	N.D.	N.D.
Benzo(a)Pyrene	ng/m³	IS 5182 (Part 12):2014	1.0	N.D.	N.D.	N.D.	N.D.

REMARKS: * These results are on the basis of 1 hour sampling.

Terms & conditions

- The report for publication, arbitration or as legal dispute is not valid.
- Test sample will be retained for 07 days after issue of report unless otherwise agreed with customer.
- This is for information as the party has asked for [illegible]

28/11/2022
PREPARED BY

ULTIMATE ENVIROLYTICAL SOLUTIONS

For ULTIMATE ENVIROLYTICAL SOLUTIONS

AUTHORIZED SIGNATORY

End of the test report

Ultimate
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099
Ph : 0771 - 4027777 I Email : ultimatenviro@gmail.com

Name & Address Of The Customer	Report No.	UES/TR/22-23/05146	
To, Jindal Power Limited P.O. Tamnar, District: Raigarh 496107 (C.G.)	Lab Ref No.	UES/22-23/AAQM/011685-011686	
	Date Of Sampling	22/11/2022	
	Date Of Receipt	23/11/2022	
	Date Of Report	26/11/2022	
	Date Of Analysis	Start:23/11/2022	End:26/11/2022

SAMPLE DETAILS

Monitoring For	Ambient Air Quality Monitoring		
	1. CHP Outside (Canteen)	Latitude	22.108598
		Longitude	83.522472
	2. CHP Outside Office	Latitude	22.109679
		Longitude	83.524033
Customer Ref. No. & Date	4400016513, DATED: 11.11.2022		
Duration Of Sampling	As per CPCB norms		
Sample Collected By	Laboratory Chemist		
Sampling Procedure	As Per Method Reference		
Sample Quantity/Packing	Filter Paper (PM_{10}): 1X1 No., Filter Paper ($PM_{2.5}$): 1X1 No. SO_2: 30mlX1 No. PVC Bottle, NO_2: 30mlX1 NO. PVC Bottle, Rubber Bladder: 1X1 No.		

TEST REPORT

PARAMETER	UNIT	METHOD REFERENCE	NAAQM STANDARD	RESULT	
				CHP Outside Canteen	CHP Outside Office
Particulate Matter size less than 10 microns (PM_{10})	µg/m³	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100	67	69
Particulate Matter size less than 2.5 microns ($PM_{2.5}$)	µg/m³	CPCB Guidelines Vol.-I	60	35	36
Sulphur Dioxide (SO_2)	µg/m³	IS 5182 (Part 2): 2001; RA 2006 &CPCB Guidelines Vol.-I	80	12	15
Nitrogen Dioxide (NO_2)	µg/m³	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80	21	22
Carbon Monoxide (CO)*	mg/m³	IS 5182(Part 10):1999, RA 2003	4.0	0.5	0.4
Lead (Pb)	µg/m³	CPCB Guidelines Vol-I and AAS Method	1.0	N.D.	N.D.
Nickel (Ni)	ng/m³	CPCB Guidelines Vol-I and AAS Method	20	N.D.	N.D.
Arsenic (As)	ng/m³	CPCB Guidelines Vol-I and AAS Method	6.0	N.D.	N.D.
Mercury (as Hg)	ng/m³	CPCB Guidelines Vol-I and AAS Method	-	N.D.	N.D.
Ozone (O_3)*	µg/m³	CPCB Guidelines Vol-I	180	22	24
Ammonia (NH_3)	µg/m³	CPCB Guidelines Vol-I	400	16.4	13.8
Benzene (C_6H_6)	µg/m³	IS 5182 (Part 11):2006	5.0	N.D.	N.D.
Benzo(a)Pyrene	ng/m³	IS 5182 (Part 12):2014	1.0	N.D.	N.D.

REMARKS: * These results are on the basis of 1 hour sampling.

Terms & conditions

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- *Test sample will be retained for 07 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for (Desk Data) only.*

28/11/2022 PREPARED BY	For ULTIMATE ENVIROLYTICAL SOLUTIONS AUTHORIZED SIGNATORY

……………………End of the test report……………………

RAPID ENVIRONMENTAL AUDIT REPORT
OF
4X250 MW & 4X600 MW THERMAL POWER PLANTS
INCLUDING RABO DAM AREA
AND
800 TPH COAL WASHERY
OF
M/S JINDAL POWER LIMITED, TAMNAR, RAIGARH (CG)

Submitted to

JINDAL POWER

JINDAL POWER LIMITED, TAMNAR, RAIGARH (CG)

by

Centre of Mining Environment
Department of Environmental Science and Engineering
Indian Institute of Technology (ISM), Dhanbad – 826 004

March, 2022

RAPID ENVIRONMENTAL AUDIT REPORT OF 4X250 MW TPP, 4X600 MW TPP INCLUDING RABO DAM AREA AND 800 TPH COAL WASHRY OF M/S JINDAL POWER LIMITED, TAMNAR, RAIGARH (CG)

Preamble

Demand for energy is growing day by day. According to current forecasts, the world's energy requirement will be doubled over the next 25 years. The major part of this enormous increase will be in developing countries like China and India. The reasons for the significant increase in energy requirements are population growth and the need to catch up in the areas of economic and social development.

Jindal Power Limited (JPL), a subsidiary of Jindal Steel & Power Ltd. (JSPL), is contributing significantly to the growing needs of power in the Country. To meet the growing power demand in India, Government of Chhattisgarh and Jindal Power Limited (JPL) has entered into an understanding to enhance the power generation capacity by installing, operating and maintaining power plant in the State. JPL is located at Tamnar, Raigarh, Chhattisgarh. The company is certified for the ISO 9001:2015, ISO 14001:2015 , ISO 45001:2018 and ISO 50001:2018 (Energy Management System) by TUV NORD. JPL is also certified by Quality Circle Forum of India (QCFI) for implementation of Five-S Work Place Management System. JPL, Tamnar is India's first mega power plant in the private sector. The Company has invested approximately Rs. 4338 crores for setting up a 1000 MW power plant and Rs 13410 crores for setting up 2400 MW, the 1st unit of 4X250MW commenced commercial operation in December 2007. All four units (250 MW each) were commissioned within a span of nine months. JPL enhanced the power generation capacity through addition of 2400 MW (4 x 600 MW) thermal power plant adjacent to the existing power plant. All four units (600 MW each) were commissioned.

The fuel supply for 4x250 MW TPP is met through e-auction from nearby Coal Mines and for 4X600 MW TPP is met through FSA from SECL & MCL and e-auction. A 6.9 km conveyor pipeline (closed system) has been set up for transportation of coal between the CHP and the plant. The JPL is constructing another Close Circuit Pipe Conveyor (CCPC) from MCL/SECL Mines to JPL, Tamnar for transportation of Coal for 4x600 MW TPP. The Company has constructed a 258 km, 400 KV Double Circuit transmission line from the plant to the PGCIL sub-station at Raipur through which power can be sold anywhere in India. For meeting the plant (4x250 MW) water requirement, an 18 m high Rabo dam over the Kurket River has been built, 25 km away from the plant and JPL is build 55 km long water pipeline from Kalma Barage (Constructed at Mahanadi

river) to plant . The 4X250 MW TPP was set up with four Turbine Generators of 250 MW each, and 4X600 MW TPP was set up with four Turbine Generators of 600 MW each, supplied by BHEL.

Since its establishment, the company is complying with stipulated EC conditions prescribed by MoEF&CC/GOI,. M/s JPL is conducting yearly Environmental Audit of their 4x250 MW and 4X600 MW Thermal Power Plant including Rabo dam area for ensuring various regulatory standards prescribed by MoEF&CC/GOI and CECB. In this context, M/s Jindal Power Ltd. has invited IIT (ISM), Dhanbad to conduct a rapid comprehensive environmental audit of 4x250 MW thermal power plant (TPP) including Rabo Dam area, 4x600 MW thermal power plant and 800 TPH Coal washery as per the conditions stipulated by CECB, Raipur in Consent to Operate and Environmental clearance & its amendments.

This study is conducted to assess the present status of environmental performance of plant based on site inspections and review of records with special reference to consent to operate conditions as stipulated by CECB, Raipur and condition of Environment Clearance stipulated by MoEF&CC. The study includes the environmental audit of 4x250 MW thermal power plant including Rabo Dam area, 4x600 MW thermal power plants and 800 TPH Coal washery.

1.0 Introduction

JPL is the first power plant to achieve 'Mega Power' project status in the private sector in India. This plant has also been certified by ISO 9001:2015, ISO 14001:2015 , ISO 45001:2018 and ISO 50001:2018 (Energy Management System) Standards. The power plant site is located near the village Tamnar in Raigarh District of Chhattisgarh State. The site is situated at about 25 km (aerial) North of Raigarh town and falls under Toposheet Nos. 64(N) and 64(0) of Government Survey of India. The boundary is confined within the latitude of 22º05′38′′-22º06′44′′ N and longitude 83º26′22′′- 83º27′37′′ E. Location of the plant site is shown in **Fig 1.** The site is approachable from Raigarh by the State Highway which branches off at Punjipathra, about 12 km from the site and 35 km from the Raigarh town. The nearest Railway Station is Raigarh at about 50 km (by road) from the site. The nearest Airport is at Raipur, which is about 290 km and the nearest seaport is Haldia at Kolkata, which is about 550 km from the site.

Total water requirement of the plant is met from Rabo dam which has been built on the Kurket River 25 km away from the plant and Kalma Barrage build on the Mahanadi River 55 km away from the plant. The total coal requirement for 4x250 MW TPP is met through e-auction from

nearby Mines and for 4X600 MW TPP is met through FSA from SECL & MCL and e-auction. A 6.9 km conveyor pipeline (closed system) has been set up for transportation of coal between the CHP and the plant. The Company has established a 258 Km, 400 KV Double Circuit transmission line from the plant to the PGCIL sub-station at Raipur through which power can be sold anywhere in India.

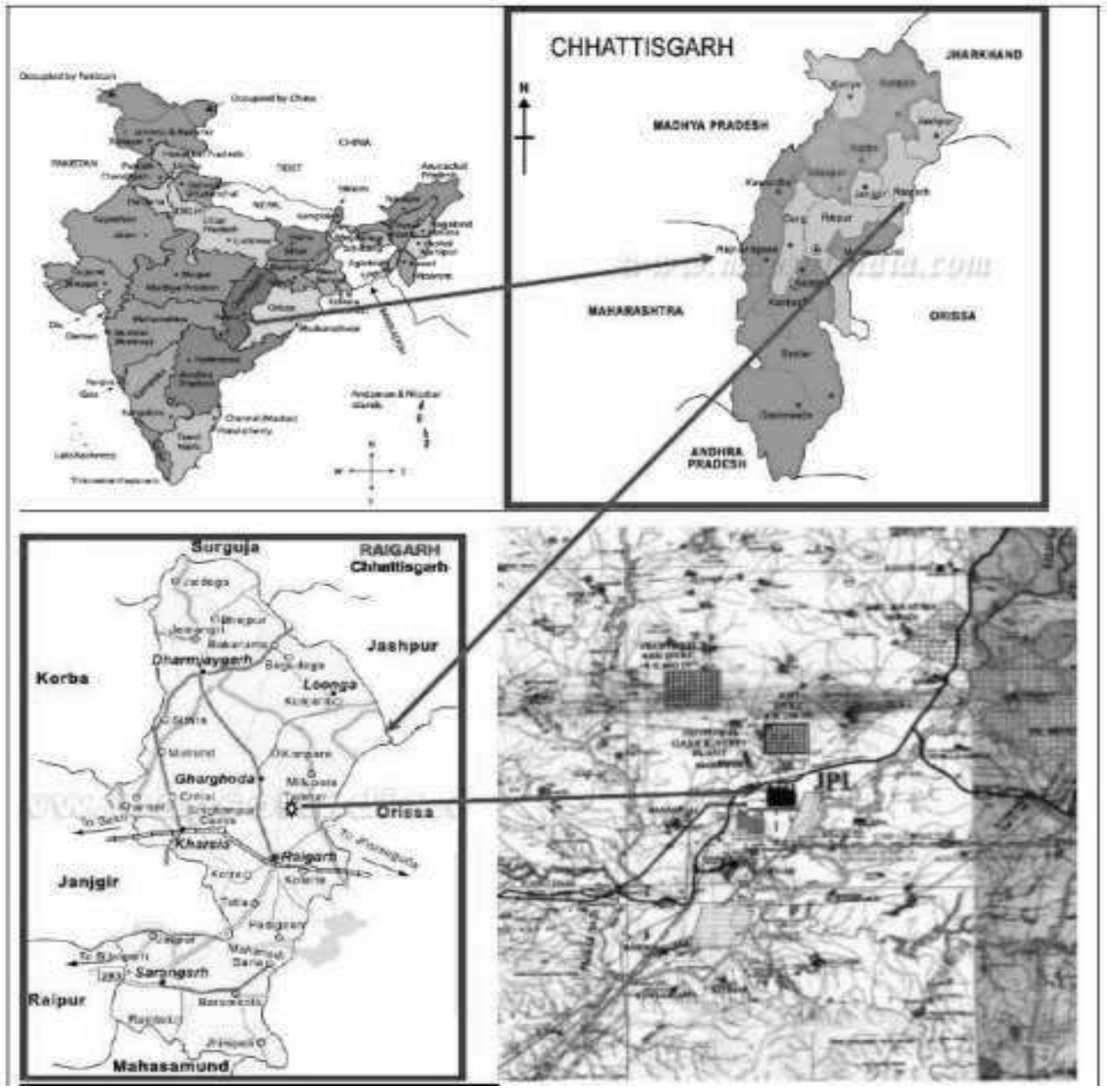


Figure 1: Location Map of the Study Area

2.0 Scope of the Rapid Comprehensive Environmental Audit

The scope of the study includes Environmental Audit for 4x250 MW TPP including Rabo Dam area, 4x600 MW TPP and 800 TPH Coal Washery as per the condition stipulated by MoEF&CC/GOI New Delhi & CECB, Raipur in Environment Clearance & Consent to Operate of TPP, respectively.

3.0 Objectives of the Study

The specific objectives of this study include:

- To conduct a comprehensive audit for 4x250 MW TPP including Rabo Dam area, 4x600 MW thermal power plant and 800 TPH Coal washery to assess the compliance of various environmental attributes, performance efficiency of the plant, assessment of effectiveness of various pollution control measures implemented by JPL and other initiatives undertaken for the abatement of environmental pollution and upliftment of the society.
- To propose the Action Plan in case there exists certain gaps in compliance or even beyond compliance to improve the Environmental Performance of M/s JPL for current activities.

4.0 Methodology

The methodology for conducting Rapid Environmental Audit of M/s Jindal Power Limited, Tamnar, and District Raigarh included in-situ inspection of various units with reference to the stipulated consent to operate conditions, analysis of past and existing environmental data/records/documentation provided by M/s JPL. As JPL is an ISO 14001 certified company the documentation of environmental performance record keeping was found up to date and well documented. Hence these data and records were also used and referred in analyzing the environmental performance of the plant. The study components were broadly divided under four activity plan components and are as under:

- The study team visited the Jindal Power Plant including Rabo Dam situated on Kurket River, inspection/audit of various pollution control facilities like ESPs, Bag Filters, Sewage Treatment Plants, ETP, Fugitive emission controls from coal handling and transport framework, occupational exposure status, green belt development and its effectiveness, Continuous Ambient Air Quality Monitoring Stations (CAAQMS), Continuous Emission Monitoring System (CEMS), and Continuous Effluent Quality Monitoring System (CEQMS), Environmental lab, water treatment plant, ash dyke area etc.

- The team of experts also visited the in-house infrastructure and laboratories including ecological & horticultural observatory for in-situ assessment of status of facilities and QA/QC practices adopted for different analysis and record keeping etc. During the visit the discussion were also made on various environmental management practices adopted in the plant including design and performance of various pollution control systems.
- The major component of the study included the review of documentation/data on environmental aspects for last 24 months i.e. from April, 2020 to March, 2021 and April, 2021 to March, 2022 in the context of stipulated consent to operate conditions. In order to evaluate the existing environmental performance of the plant, the team reviewed the Environmental Statement Report, Audit Reports, as well as monthly environmental data reports submitted to MoEF&CC / GOI and/or Central Pollution Control Board (CPCB). The ISO 9001:2015, ISO 14001:2015 , ISO 45001:2018 reports provided additional information.
- On the basis of the comprehensive audit of the different units of integrated plant, the environmental compliance of the regulatory requirements under water & air acts, the environmental performance of the plant was assessed.

4.1: Introduction to Audit Team

The study team consisting of Senior Environmental Expert from IIT (ISM), Dhanbad led by Professor Dr. Gurdeep Singh (HAG) Centre of Mining Environment, Department Environment Science and Engineering, IIT (ISM), Dhanbad was involved in Environmental Audit (23rd to 25th, March, 2022) of TPPs including Rabo Dam situated on Kurket River & Coal Washery.

4.2: Starting of Audit

The Environmental Audit is starting with an opening meeting on 23rd March 2022 with all concerned HODs of Jindal Power Limited. The meeting was chaired by Head of Jindal Power Limited.

5.0 Introduction to Environmental Management Department

Jindal Power Limited, Raigarh has a full-fledged Environmental Management Department (EMD) which has been set up for the management of various environmental issues at Thermal Power Plants, and Rabo Dam. A full-fledged laboratory for analysis of various environmental attributes has also been set up with qualified technical/scientific staffs. The Environmental Laboratory is set-up with state of art type monitoring and analysis equipment as per the Chhattisgarh Environmental Conservation Board (CECB) guidelines. The Environment Management Department is headed by Shri S. K. Singh, GM, who is reporting directly to the Head of the Organization. Two Dy. Manager,

two lab technicians and one field staff are working under the control of GM (Environment Management Department). The hierarchal structure of EMD is given in **Table-1.** They have established 06 Nos. of online Ambient Air Quality Monitoring Stations (CAAQMSs), Continuous Effluent Quality Monitoring System (CEQMS) and continuous emission Monitoring (PM, SO2 & NOx) for assessing the ambient air , Effluent and stack emissions respectively. Regular monitoring of different components of environment i.e. air, water, soil, noise etc. are conducted on regular basis to assess the environmental quality and to exercise suitable mitigative measures, if necessary.

Table-1: Hierarchal Levels of Environmental Management Department

Personnel	No of persons
GM	01
Dy. Manager	02
Lab Technician	02
Field Staff	01
Total	**06**

5.1 Activities of Environment Management Department

Environmental Management Department performs following activities:

- Evaluation of the performance of existing pollution control equipment and systems periodically and take timely action to keep the equipment at its optimum performance conditions.
- Implementation of ISO: 14001- Environmental Management System, ISO: 9001-Quality Management System, OHSAS: 45001 Occupational Health & Safety Management System, ISO: 500001-Energy Management System and Five-S Work Place Management System.
- Implementation of Plantation Program.
- Implementation of various environmental control measures.
- Study the impacts of project activities on the environment on continuous basis.
- Keep vigil on the efficiency of water management system.
- Conducting various environmental studies.
- Getting Environmental Clearance/ Consent to Establish/ consent to operate for expansion projects and renewal of consent/authorization for existing plant.
- Regular monitoring of ambient air quality, stack emissions and water/wastewater.

- To keep records of monitoring etc. in a systematic way, so as to facilitate easy access, when needed by statutory agencies, etc.
- Submission of reports /returns as per the Acts/Rules/Notifications/Guidelines.

5.2 Pollution Measurement Equipment's in EMD

Environment laboratory is well equipped with latest equipment's to monitor various air and water quality parameters. **Table-2** gives the detail of the equipment's available in the Environment Management Department Laboratory.

Table-2: List of Equipment in EMD Laboratory

S.No.	Name of the instrument	Quantity in Nos.	Make
Air Monitoring			
1	CAAQMS	6	Environment SA India Pvt. Ltd.
2	Fine particulate Sampler	7	Envirotech Instruments Pvt. Ltd
3	Respirable Dust sampler	7	Envirotech Instruments Pvt. Ltd
	Meteorology		
4	Weather monitoring station	1	Envirotech Instruments Pvt. Ltd
	Noise Monitoring		
5	Sound Level Meter	2	Extech instruments and Lutron
	Stack Monitoring		
6	Stack monitoring kit	2	Vayubodhan Upkaran Private Ltd.
7	Flue Gas Analyzer	1	Testo
8	Mercury Analyser	1	Sick India Pvt, Ltd.
	Water monitoring		
9	AAS	1	Shimadzu, Japan
10	BOD Incubator	1	Hach
11	COD Digester Unit	1	Hach
12	Hot air oven	1	Grieve
13	Water bath	1	Hach
14	Colorimeter	1	Hach
15	Hot plate	1	Cimarec
16	Magnetic stirrer	1	Remi
17	Filtration unit for SS	1	Klassic Klarol Filter Pvt. Ltd.
18	Portable D.O. Meter	1	Hach

19	pH Meter	1	Hach
20	Electronic balance	2	Sartorius/Metler
21	Oil& Grease separation funnel	1	Merck
22	Microscope	1	Carl Zeiss
23	Water Level Indicator with 150 Mtr. Cable	1	In-situ Inc, Canada
24	COD Digester System	1	Chemiline
25	Hot air Oven Double Walled with digital temperature	1	Unitech
26	Continuous Effluent Quality Monitoring System (CEQMS)	1	Endress+Hauser (M/s Engineering Equipment's)

6.0 Validity of Consents /Authorizations details

The validity of various consent for operating Thermal power plant, coal mine and authorization for handling and disposal of hazardous and biomedical wastes are given in **Table- 3.**

Table- 3: Description on validity of Consents /Authorizations of JPL

Sl. No.	Particular	Valid	
		From	To
1	Consent to Operate for Coal Washery (800 TPH)	**12.02.2022**	**31.01.2025**
2	Authorization under Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 for 800 TPH Coal Washery	**22.06.2020**	**21.06.2025**
3	Consent to Operate for TPP Phase-I (2x250MW) & Phase-II (2x250MW)	**01/12/2021**	**30/11/2024**
4	Authorization under Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 for 4X250 MW TPP	**19/03/2019**	**18/03/2024**
5	Consent to Operate for 4x600MW	**10/01/2022**	**31/12/2024**
6	Authorization under Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 for 4X600 MW TPP	**11/01/2021**	**10/01/2026**
7	Authorization under Bio-Medical Waste (Management & Handling) Rules, 1998 & as amended Rules, 2000	**One time authorization No. 2682/HO/BMW/CECB/ATAL NAGAR, RAIPUR**	

7.0 Material balance at JPL

7.1 Coal balance at JPL

For 4X250 MW TPP

Total coal requirement for 4X250 MW TPP is approx. 6.25 MTPA. Coal used in the plant contains approx.12% of moisture content. Carbon content of the coal is 27% out of which 99.99% is converted to CO_2 and remaining goes as unburnt particulates in gases. The non-combustible part of the coal is 39% out of which 99.99% is converted into ash which constitutes 80% of fly ash and remaining 20% as bottom ash. The detailed coal balance diagram is shown in **Figure 2a.**

For 4X600 MW TPP

Total coal requirement for 4X600 MW TPP is approx. 11.7 MTPA. Coal used in the plant contains approx.12% of moisture content. Carbon content of the coal is 27% out of which 99.99% is converted to CO_2 and remaining goes as unburnt particulates in gases. The non-combustible part of the coal is 39% out of which 99.99% is converted into ash which constitutes 80% of fly ash and remaining 20% as bottom ash. The detailed coal balance diagram is shown in **Figure 2b.**

7.2 Heat balance at JPL

At 4X250 MW TPP

Total heat input in the plant is 814 MKC/h out of which input of heat through coal is 565 MKC/h and remaining from the recovered heat from various recovery processes. Out of this total heat, 650 MKC/h is utilized in steam generation and rest is lost. Out of the total energy used in steam generation, 215 MKC/h is used for power generation and rest is lost through cooling towers and others. The detailed heat balance diagram is shown in **Figure 3a.**

At 4X600 MW TPP

Total heat input in the plant is 2008 MKC/h out of which input of heat through coal is 1344 MKC/h and remaining from the recovered heat from various recovery processes. Out of this total heat, 1576 MKC/h is utilized in steam generation and rest is lost. Out of the total energy used in steam generation, 516 MKC/h is used for power generation and rest is lost through cooling towers and others. The detailed heat balance diagram is shown in **Figure 3b.**

7.3: Water Balance at JPL

At 4X250 MW TPP

The total water requirement of the plant for FY-20-21 was approx. 24410 m^3/day out of which 20752 m3/day is used in cooling system, 668 m3/day is used in boiler and rest 2990 m3/day is used for domestic & other consumption purpose. The JPL is adopting zero discharge concepts. Hence the effluents generated from different processes are recycled / reused fully within the plant. The detailed water balance diagram is shown in Figure 4a.

At 4X600 MW TPP

The total water requirement of the plant for FY 2020-21 was approx. 50908 m^3/day out of which 49346 m^3/day is used in cooling system, 682 m^3/day is used in boiler and rest 880 m^3/day is used for domestic & other consumption purpose. The JPL is adopting zero discharge concepts. Hence the effluents generated from different processes are recycled / reused fully within the plant. The detailed water balance diagram is shown in **Figure 4b.**

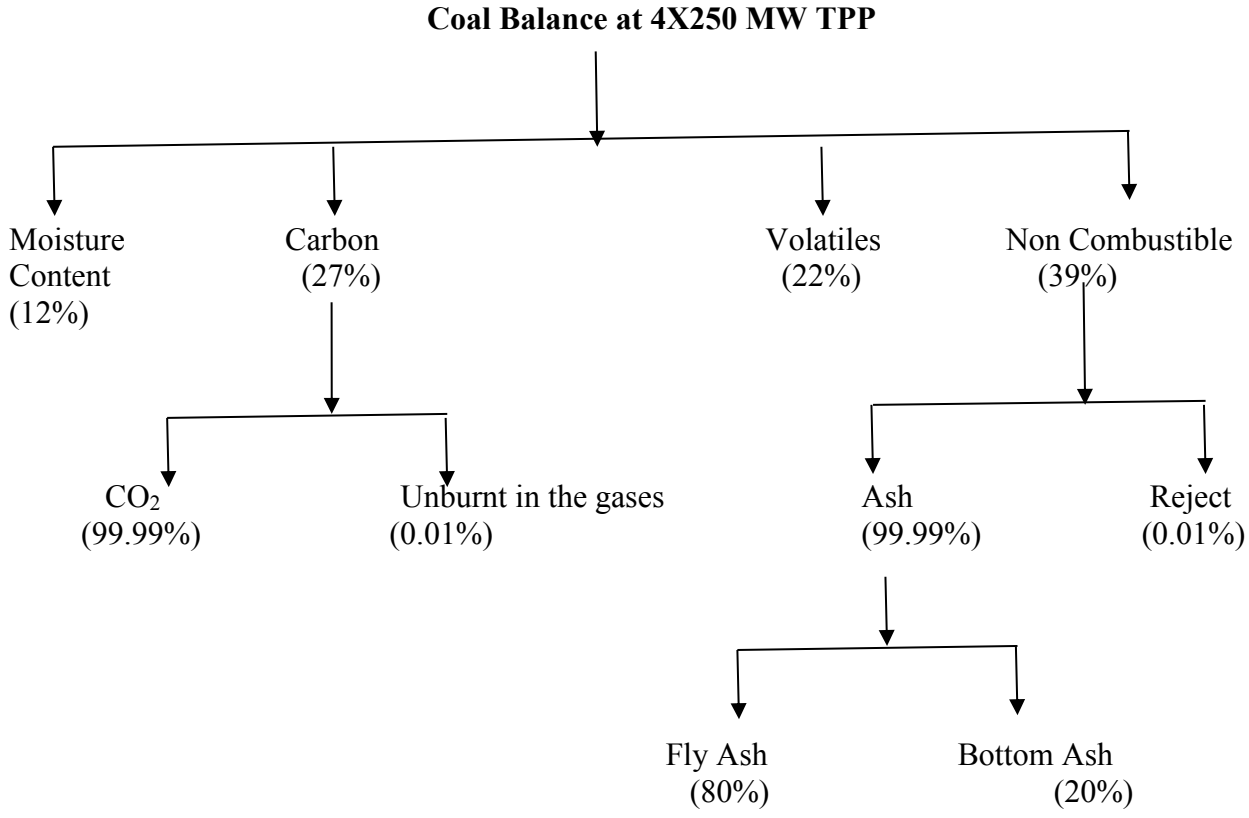


Figure 2a: Coal Balance Diagram at 4X250 MW TPP of JPL, Tamnar

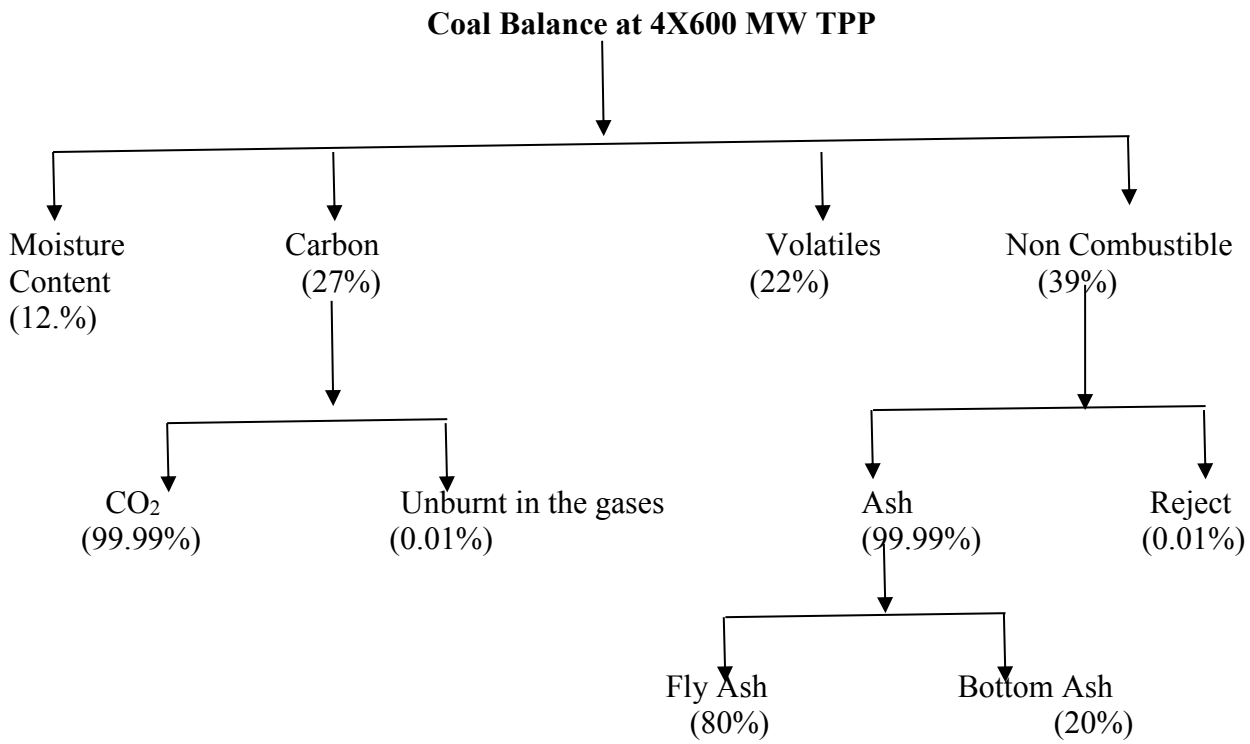


Figure 2b: Coal Balance Diagram at 4X600 MW TPP of JPL, Tamnar

Heat Balance at 4X250 MW TPP

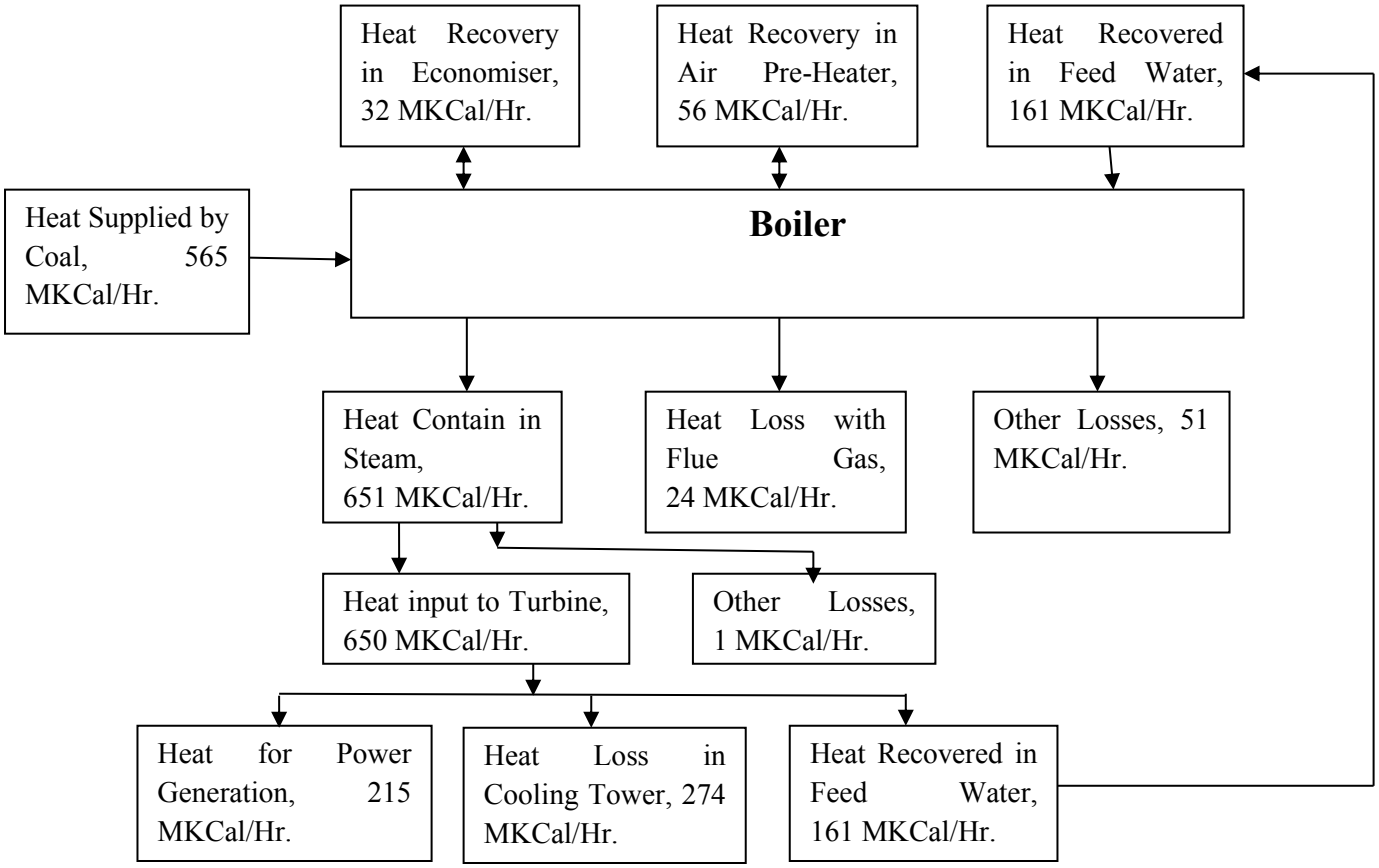


Figure 3a: Heat Balance at 4X250 MW TPP

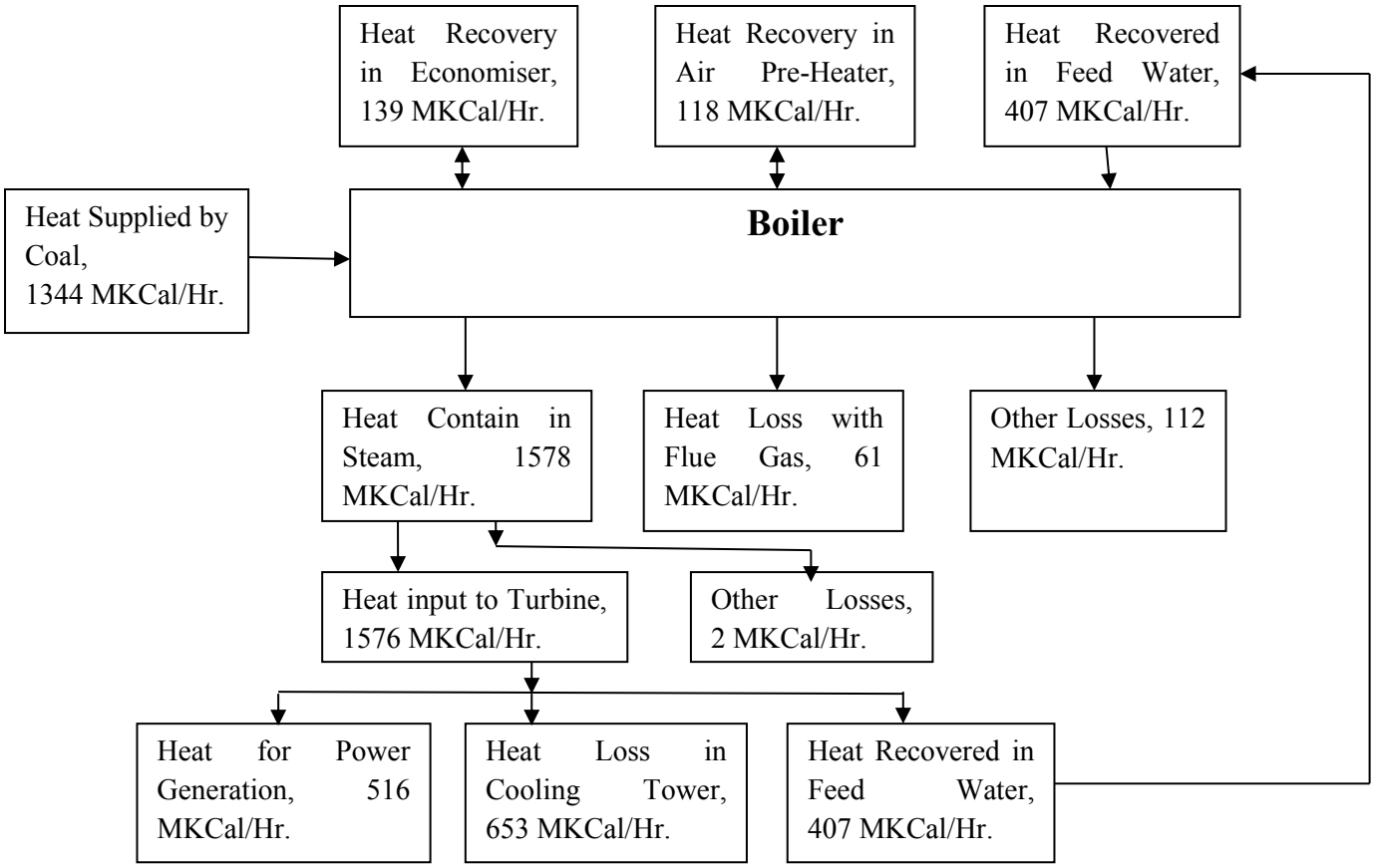


Figure 3b: Heat Balance at 4X600 MW TPP

Water Requirement* (used in FY 2020-21)

At 4X250 MW TPP

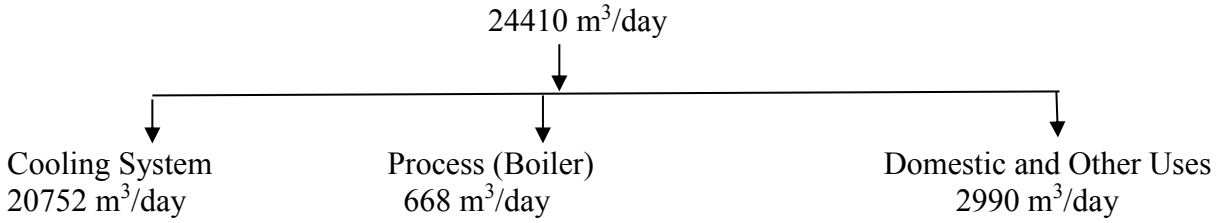


Figure 4a: Water Balance Diagram at 4X250 MW TPP JPL, Tamnar

Water Requirement* (used in FY 2020-21)

At 4X600 MW TPP

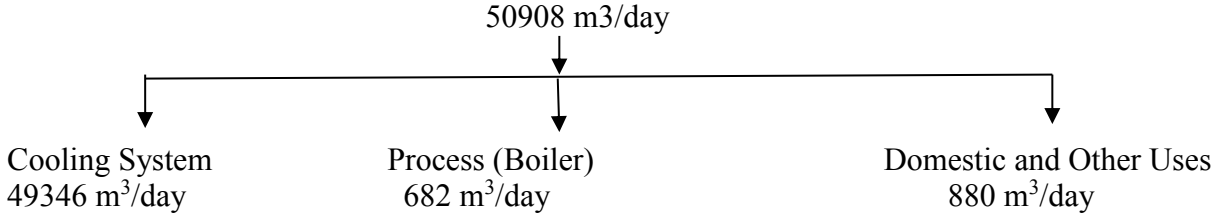


Figure 4b: Water Balance Diagram at 4X600 MW TPP JPL, Tamnar

8.0 Pollution Control Measures at JPL

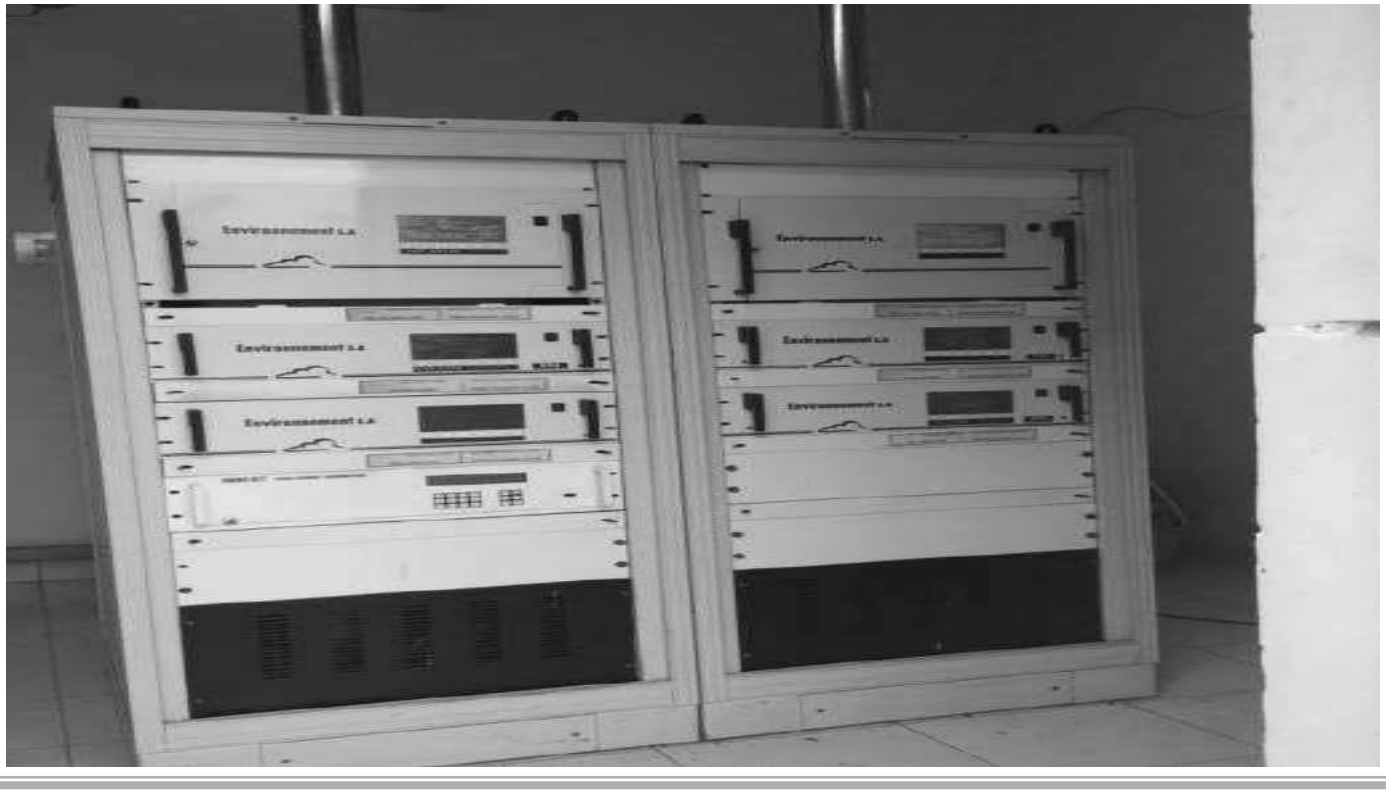
M/s Jindal Power Limited is equipped with the latest technologies and instruments to control Air, Water, Noise and Land Pollution in and around the Thermal Power Plant and Coal Washery. A state-of-the-art environmental monitoring laboratory has been set up at JPL for monitoring Air, Water, Noise and other environmental parameters. The Laboratory is well equipped with monitoring/ sampling and analytical instruments. The details of the laboratory have been provided in section 5. The details on the various environmental pollution control measures for various components of environment are as follows:

8.1 Air Pollution Control

8.1.1 Point Source (At Plant)

A bi-flue Stack has been installed for both TPPs. 4x250 MW TPP having a height of 220 m and 4X600 MW TPP having a height of 275 m as per the Environmental Clearance (EC) conditions. The internal diameter of the stack is 4.75 m for 4X250 MW and 6.7 m for 4X600 MW with on-line monitoring system (opacity meter & gaseous emission) for continuous monitoring of stack emissions. ID fans are installed and exit velocity of 25 m/s for 4X250 MW and 22 m/s for 4X600 MW are maintained. Electrostatic Precipitators (ESPs) (BHEL make) are installed in 4X250 MW & 4X600 MW to control the particulate emissions from the stack well below 50 mg/Nm^3. The efficiency of installed ESPs was found to be more than 99.9%. The ESP's are designed to achieve particulate emission below 50 mg/Nm^3. Adequate space has been provided for installation of flue gas desulphurization plant for control of sulphur dioxide in future. The process of JPL has also installed 06 Nos. of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) for continuous monitoring of ambient air quality in and around the plant area. Online connectivity of CAAQMS, CEMS & EQMS to CPCB & CECB servers has been done as per CPCB direction. Ambient air quality data and the stack emission data is being displayed digitally by Electronic Display Board near the main gate/entrance of the company, showing the real time status of ambient air quality for stakeholders.

ESP



CAAQMS

Online CEM System

8.1.2 Fugitive Emissions (At Plant)

To avoid the fugitive dust emission, the coal is transported to CHP through covered Tracks and from CHP through Cross Country Pipe Conveyer (CCPC) of 6.9 km length from the CHP to the power plant. Pipe conveyor system is free from spillage of coal, hence there is no dust emission during transportation of coal. Bag filters are provided at fly ash silos and coal bunkers top. All conveyor belts and transfer points are covered. Water spraying system is provided at coal stock area, transfer points etc.

Road Sprinkling system

Mechanical Road Sweeping Machine

8.2 Water Pollution Control

8.2.1 Water Pollution Control (At Plant)

Water requirement of the Thermal Power Plant is being met from Rabo dam constructed across Kurket River. Around 177.542 hectares forest area had been identified under submergence area and a separate clearance from Chhattisgarh Govt. Forest Division has been obtained vide letter No.F-7-19/03/10-2, October, 2005 for the diversion of forest area under the Forest (Conservation) Act, 1980. Water reservoir of 35 million cu.m capacity at the Rabo dam and 12 lakh cu.m capacity at plant site have been constructed to cater the water demand. Cooling Tower with closed circuit cooling device has been installed and a COC > 5 is maintained to ensure that minimum water is drawn for make-up purpose. No extraction of groundwater resources is being carried out for plant purposes.

JPL is operating on the concept of zero discharge. No wastewater is discharged into the surface water bodies, outside the plant boundary. Treated effluents after conforming to prescribed standards are re-circulated and re-used within the plant premises. Treated water from the Neutralization pit, Boiler blow down and Cooling tower blow down are taken to Central Monitoring Basin (Guard Pond) and reused in ash slurry preparation. 100% decanted ash water from ash dyke is re-circulated and reused for ash slurry preparation. The flow chart for recycling of treated slurry water is shown in **Figure 5**. A sewage treatment plant (STP) of capacity 500 m^3/ day for treatment of domestic sewage from the plant has been set up at Shaktivihar-1. The flow diagram for the sewage treatment plant is shown as **Figure 6.**

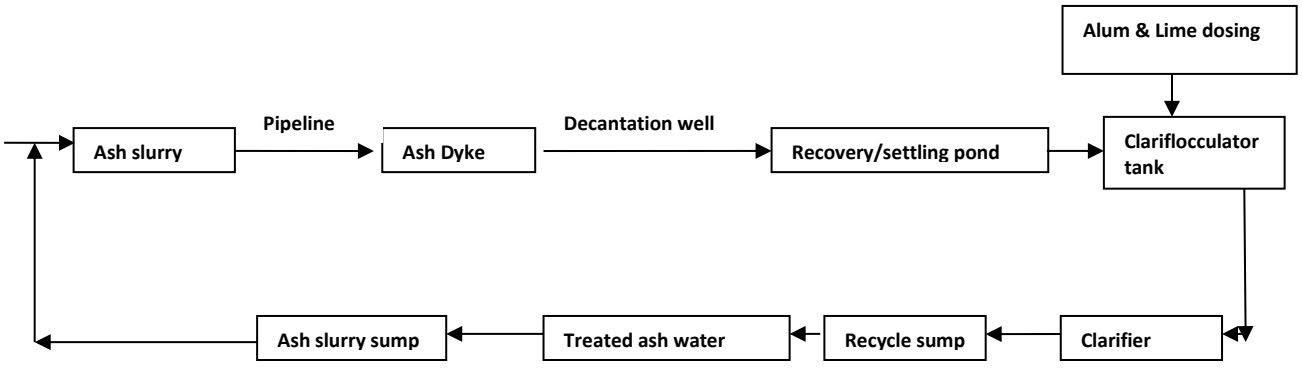


Figure 5: Flow chart for recycling of treated ash slurry water

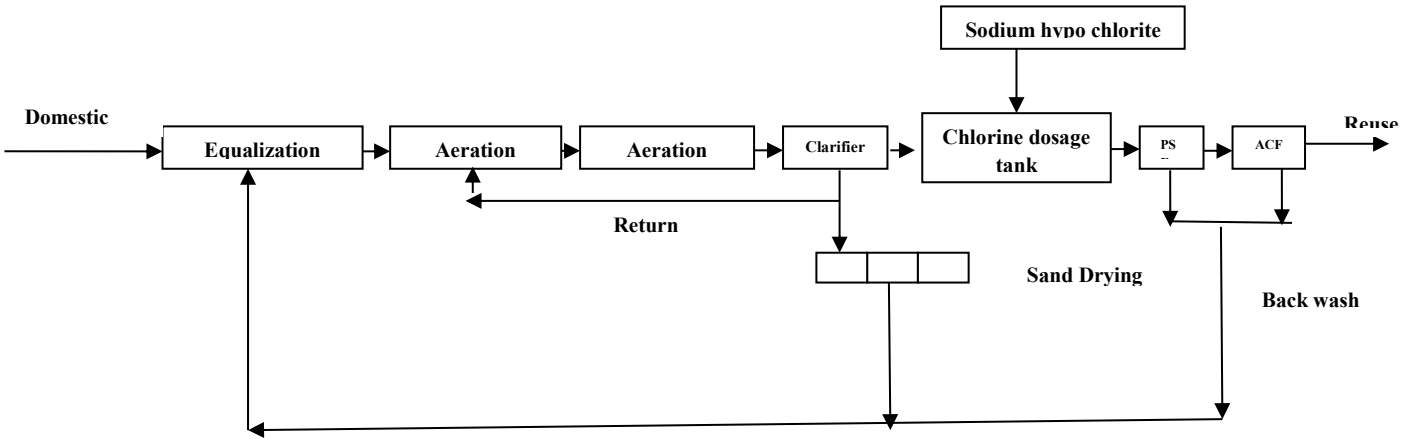
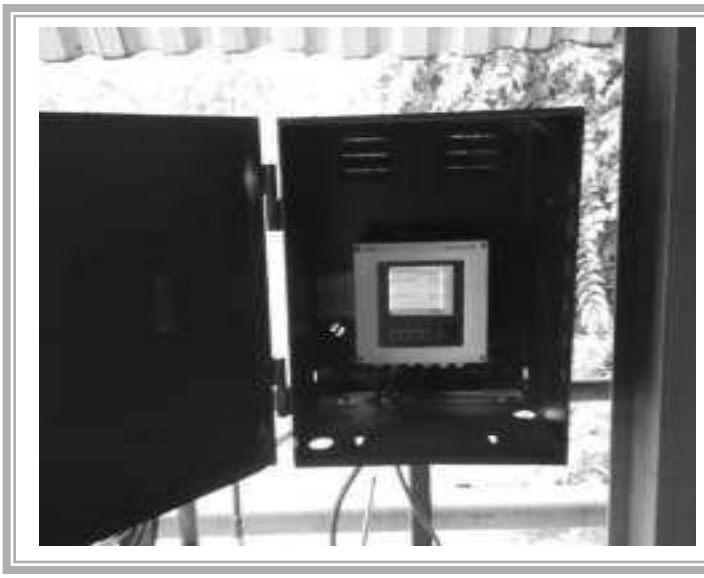


Figure 6: Flow Diagram of STP at JPL, Tamnar

Monitoring of the ground & surface water quality is being conducted at regular intervals in and around the plant area including ash pond. Ash pond area is provided with clay compacted impervious and HDP/LDPE lining layer as per CPCB guidelines. Suitable drains along with sedimentation pit are made all around the coal stockyard to collect the surface drainage.

ETP



CEQM system

8.3 Noise Pollution Control

8.3.1 Noise Pollution Control (At Plant)

The noise level within the Thermal Power Plant is being maintained within the prescribed limit through installation of acoustic hoods, silencers & enclosures. In addition, regular maintenance of equipments and machineries are done to reduce the noise levels within the premises. Earplugs & Earmuffs are provided to the employees working in the noise generating areas. Noise level monitoring is being regularly conducted for day & night time for assessing the status of noise pollution for evolving suitable control measures. To control the noise and air pollution, a Green belt (along the plant boundary) is developed as per the CPCB guidelines.

Greenbelt & Plantation

8.4 Land Pollution Control

8.4.1 Land Pollution Control (At plant)

Main issue of the land pollution control emerges from the generation of huge quantity of fly ash and its management. The dry fly ash is collected through pneumatic conveying system in 2 No. ash silos of capacity 1600 MT each of 4X250 MW and 4 nos of ash silos of capacity 2300 MT each of 4X600 MW. Coal is transported from the coal mine to CHP through covered tracks and from CHP through Cross Country Pipe Conveyer (CCPC). Pipe conveyor system is free from spillage of coal; hence there is no dust emission during transportation of coal. All transfer

points are covered and provided with water sprinkling arrangement. Wet ash is transported to ash dyke through ash slurry pipelines. The area earmarked for ash dyke is 198 Ha. for 4X250 MW and 4X600. The average height of the ash dyke is limited to 18 m only. Fly ash is also being utilized in filling of surrounding low land, making fly ash bricks, mine back filling etc.

CCPC

8.5 Hazardous Waste Management

Used oil/Spent oil is produced from the overhauling of the different units of the plant. The used oil generated is being sold to the authorized recycler for its proper treatment & disposal.

Table- 4: Hazardous Waste Generation and Management at JPL

Year	Plant	Used/Spent oil quantity dispatched to authorized recycler in KL	
		Cat. 5.1	Cat. 5.2
2020-2021	4X250 MW	40.79	0
	4X600 MW	53.36	0
	800 TPH Coal Washry	0	0

8.5.1 Brief description of method of treatment and disposal of Bio-Medical Waste

(I) Collection and Segregation

Generated Bio-Medical Wastes are collected and segregated by providing separate colour coded covered bins for different category of wastes.

(II) Method of Treatment

The generated waste sharps like needles, syringes, blades etc. and solid waste like tubings, plastic bottles etc. are treated with 1% hypochlorite solution with a minimum contact period of 30 minutes and then the wastes are shredded. The generated soiled waste like blood contaminated cotton, dressings etc. are sterilized with steam under particular temperature and pressure by using autoclave technology.

(III) Method of Disposal

The needles, syringes, blades etc. after disinfection and shredding, are disposed in onsite rectangular pit covered with concrete slab.

The soiled and solid wastes are disposed by deep burial method. The soiled and solid wastes are disposed in pit of depth about 2 meters and then covered with lime. The Burial is performed under close and dedicated supervision.

8.6 Conservation of Bio-Diversity

Jindal Power Limited, Tamnar is surrounded by Sal Mixed Forest. The study area is floristically enriched. The common native plant species in the study area are *Shorea robusta*, *Tectona grandis*, *Terminalia alata*, *Dalbergia paniculata*, *Bombax ceiba* are the trees occupying the top storey. *Lagestroemia parviflora, Diospyros melanoxylon* and *Anogeissus latifolia* are the medium height species somewhere become tall and form the top storey occasionally. The common smaller trees and shrubs are *Dendrocalamus strictus, Mallotus phillipensis*, *Bridelia squamosa*, *Cleistanthus collinus*, *Kydia calycina*, *Xylia xylocarpa*, *Schleichera oleosa* and *Miliusa tomentosa*. The other species are *Aegle marmelos*, *Boswellia serrata*, *Desmodium oojeinense*, *Lannea coromandelica, Bombax ceiba*, *Sterculia urens*, *Emblica officinalis* etc. Recently *Lantana camara* has become a menace in the gaps of these forests. The other associated species but in very less number are *Acacia catechu, Gmelina arborea* etc. A very small area covering teak plantation has been found in the study area. In the hilly terrain fully exposed rock-beds and boulders are a common sight and support a very limited number of species.

A proposal for conservation of endangered wild life, flora and fauna species was prepared in consultation with State Wild Life Department, Raipur as per the guidelines of Wild Life Protection Act, 1972 and has been submitted to the Ministry vide letter No.JPL/RTPP/RKS/2.5/1897 dated 19.09.2006. Green belt of approximately 100 m width (along the plant boundary) has been developed by plantation of 1500-2000 trees per hectares as

per the CPCB guidelines. Thick greenbelt of local species like Albizia lebbeck, Ficus Benghalensis, Madhuca indica, Mangifera indica etc. is developed around the mine, roads, CHP, Washery and OB dumps. The species of *Tectona grandis, Acacia catechu, Dalbergia sissoo, Mangifera, Delonix regia, Manilkara zapota,* Cassia semia, *Madhuca indica* and *Ficus sps* were planted in the study area. Some of these are timber yielding, fruit yielding and providing shelter to various insects and birds. In next few years, these seedlings will become sapling and adults. As a result the establishment of energy flow and nutrient cycling will be restored through canopy formation, litter fall, litter decomposition, increased microbial activity etc. Further, stocked top soils are used for banana and vegetable cultivation and significant fruit and vegetable production has been observed.

In the plant area, the creation of mango orchard gives an aesthetic pleasure to people working in the plant and visitor coming for various business activities. Apart from this, Jindal Power Limited has maintained a significant and beautiful garden in which various ornamental and medicinal plants are reflecting unique impression of housekeeping management. Similarly plantation around ash dyke & surrounding, Rabo dam area, surrounding villages and colony area are going on and imparting scenic beauty in the study area. JPL, Tamnar has ranked 5th in the country by the Center for Science and Environment (CSE), New Delhi Green Rating Project (GPR). CSE has rated 47 coal based thermal power plants from across the country for their Environmental and energy performance and bagged 16th Annual Greentech Environment Excellence Award 2015 in Gold category for its outstanding achievement in Environment Management activities conforming to ISO EMS 14001 & 5-S certification, zero effluent discharge, effective utilization of fly ash, greenbelt development, installation and effective & smooth running of all pollution control equipment, continuous monitoring of stack emissions & ambient air quality, Energy Conservation initiatives etc.

9.0 Initiatives towards Environment Management

Jindal Power Limited conforms to the latest regulatory norms and aids in environmental protection practices through the implementation of state of the art technologies. Persistent efforts are made to control pollution in and around the factories premises to provide clean air and water. The company is committed for developing extensive green belt in and around the plant areas. These endeavors are done in coordination with the local forest department. JPL has installed efficient air pollution control devices with online monitoring system and works on zero discharge concepts and recycle the water after proper treatment. The industry has maintained wet and dry ash collection systems for fly ash management. JPL has signed a MoU with SECL for back-filling of mines by using fly ash and

overburden. The company has taken the following steps towards achieving a pure and pollution free environment:

- Air pollution control devices with benchmark efficiency (Electro-Static Precipitators (BHEL make) with 99.9% efficiency) have been installed with online monitoring system for controlling the emission levels through the stack.
- JPL has also installed 06 Nos. of online ambient air quality monitoring stations for continuous monitoring of ambient air quality in and around the plant area and also connected to CPCB & SPCB severs.
- To avoid the fugitive dust emission, the coal is transported through closed pipe conveyer system (6.9 km length) from the CHP to the power plant. Pipe conveyor system is free from spillage of coal preventing dust emission during transportation of coal.
- The plant has been designed on the concept of 'zero discharge'. This is being maintained by 100% recirculation/reuse of effluent after proper treatment.
- Recycled water is sprayed in the coal yard, transfer points, loading and unloading points to control the fugitive emissions.
- 3 nos. of sewage treatment plant are installed at the plant and 1 no. at colony for domestic waste water treatment and treated water is being reused for irrigation (drip line/ pop up).
- Fly Ash management is done through wet and dry ash collection system, wherein the fly ash is utilised in low land filling, brick, tiles and blocks manufacturing etc. A Fly Ash technology park is developed wherein manufacturing units for fly ash bricks, blocks and tiles are being set up along with demonstration plots for agricultural practices.
- Installed kitchen waste based Biogas plant of capacity 2 TPD near security canteen.
- 13210 no. of saplings have been planted within the Plant, Rabo dam area, Colony and road side area for the year 2019-20. Since the year 2005-06. Till 31st March 2021, more than 25 Lakhs no of saplings has been planted.
- JPL is provided free of cost fly ash to nearby fly ash bricks manufacturing units at site. (more than 20 nos.)
- Generated 24737.5 KWH Solar Energy in FY 2020-21.
- Successfully continuous running of 51 numbers Solar Street lights Installed at colony & ash dyke in FY 2020-21.
- Rain water was collected at Rain water harvesting pond and reused the water for different purposes.

- Various campaigns for building environmental consciousness are carried out on a regular basis in addition to plantation activities at nearby villages, distribution of awareness pamphlets etc. JPL also observe and celebrate environment events like World Environment Day, Earth Day, Earth Hour, and Ozone Day through different initiatives. Like every year, this year also JPL had celebrated Environment Week in World Environment Day to create awareness among employees, contractors, children, housewives etc**.**

10. Achievements for the year 2020-201 on Environment Conservation

1. A total of 13210 nos. of saplings was planted during the FY 2020-21 and their survival rate is 85%. Between the years 2005 till date, a total of more than 2.50 million saplings

have been planted covering thermal power plant, Ash Dyke area, Colony area, Coal mine, Rabo dam area, nearby villages, etc.

2. Obtained Renewal of Consent to Operate for (4 x 600 MW) from CECB.
3. Obtained Renewal of Consent to Operate for 2 X 1500 TPH Coal Crusher from CECB.
4. Obtained Renewal of Bio-medical waste disposal authorization for Plant Health Centre.
5. MoU with SECL has been signed on 07.04.2018 for use of fly ash from the TPP for backfilling of Gare Pelma IV/2 & IV/3 mines. The back filling work is in progress.
6. Continuous running of ETP to treat the waste water generated from power plant operation.
7. Recycling of waste water collected in rain water harvesting pond and maintained Zero discharge.
8. World Environment Week from 5th June, 2019 to 12th June 2019 was celebrated to propagate the mass awareness among Employees, Ladies, Children, contractor employee and students from surrounding villages.
9. Achieved "Round the clock operation" of 03 nos. STP (2000 KLD, 500 KLD, 150KLD) without any tripping & accident.
10. Zero NC with respect to Environmental Laws.
11. Achieved "Continuous running" of 06 nos. CAAQMS without any major disturbance.
12. Specific water consumption of JPL for 4X250 MW TPP is 3.02 and for 4X600 MW TPP is 2.53 m3/MW.
13. Generated 24737.5 KWH Solar Energy in FY 2020-21.

11. Awards/recognition to JPL Tamnar

Sl. No	Name of the award/certificate category	Issued authority	Year of award/ Certificate received
1.	Genentech Environment Award - 2015 in "Gold Category"	Greenetch Foundation, New Delhi	2015
2.	Green Rating Award of Thermal Power Plants	Center for Science and Environment (CSE)	2015
3.	Genentech Environment Award - 2014 in "Gold Category"	Greenetch Foundation, New Delhi	2015
4.	Genentech Award -2013 in "Platinum Category" (Highest category) in Thermal Power sector in India.	Greenetch Foundation, New Delhi	2014
5.	SURAKSHA PURASKAR - BRONZE TROPHY in Group-C (Power Generation - Thermal/ Hydel/ Nuclear Power Plants)	National Safety Council of India	2014
6.	Frost & Sullivan's Green Manufacturing Excellence Awards	Frost & Sullivan's	2013
7.	13th Annual Greentech Environment Award 2012	Greenetch Foundation, New Delhi	2012
8.	20th Horticulture Exhibition-cum-Flower Show	TRL Krosaki Refractories Ltd.	2012
9.	Excellence in Energy Efficiency	Chhattisgarh State Renewable Energy Development Agency	2011
10.	12th Annual Greentech Environment Award 2011	Greenetch Foundation, New Delhi	2011
11.	19th Horticulture Exhibition cum Flower Show	TATA Refractories Limited	2011

Certificate

12. Environment expenditure for Year 2020-21

JPL has been allocated separate budget for the expenditure on environmental protection measures and management. The expenditure by JPL on the environmental management for the FY 2020-21 for Thermal Power Plant is Rs. 513671926.

13. Compliance Status of JPL

13.1 Environmental Compliance Audit of Jindal Thermal Power Plant for Phase-I (2 x 250 MW)

Compliance Report of Environmental Clearance & additional conditions for Stage-I (2x250MW) of O. P. Jindal Super Thermal Power Plant, Tamnar vide letters No.J.13011/15/93-IA.II (T) dated 24/09/1997 & No.J.11013/41/2006-IA.II (I) dated 06/04/2011.

2	Conditions	Compliance Status
(i)	All the conditions stipulated by Madhya Pradesh Pollution Control Board vide their letter No. 2077/TS/EZ/MPPCB/96 dated 07/02/1997 should be strictly implemented.	All the conditions stipulated by the Madhya Pradesh Pollution Control Board vide their letter No. 2077/TS/EZ/MPPCB/96 dated 07/02/1996 are strictly implemented.
(ii)	**(As amended vide MoEF letter No. J-13011/15/2003-IA. II (T) dt. 24/06/05):** A bi-flue stack of 220 m height and internal diameter of 4.75 m with continuous monitoring system shall be installed for 2 x 250 MW units as Phase-1. For adequate dispersal of gaseous pollutants, exit velocity will be maintained at 25 m/sec by installing ID fans and continuous record of exit velocity shall also be maintained and submitted to the Ministry on a yearly basis.	A bi-flue stack of height 220 m and internal diameter of 4.75 m with continuous on-line monitoring system has been installed. Exit velocity of 25 m/s is being maintained. Records of exit velocity are being maintained.
(iii)	Electrostatic Precipitator having efficiency of not less 99.8% should be installed. It should be ensured that particulate emission would not exceed the prescribed limit of 150 mg/Nm^3.	Electrostatic Precipitators (ESP's) of efficiency >99.98% have been installed. The ESP's are designed to achieve particulate emission less than 50 mg/Nm3.
(iv)	Closed Circuit Cooling Device should be provided and it should be ensured that only minimum water is drawn for makeup purposes. The requirement of water for the project will be met by constructing 18 mt high dam across Kurkut River involving a cost around Rs.48 crores. The forest area coming under submergence shall be identified and separate clearance under the Forest (Conservation) Act shall be obtained by the project authorities prior to	Induced Draft Cooling Tower with closed circuit has been installed and a COC > 5 is maintained to ensure that minimum water is drawn for make-up purpose. An 18 m high dam across Kurket river has been constructed and is in operation. Around 177.542 ha. forest area had been identified under submergence area and a separate clearance from Chhattisgarh Govt. Forest

	commissioning the work on the project.	
(v)	Adequate space should be provided for installation of the gas desulphurisation plant in future for control of sulphur dioxide.	Adequate space has been provided for installation of gas desulphurisation plant in future for control of sulphur dioxide.
(vi)	Acquisition of land should be restricted to 614 ha with the following break up:- Power plant-360 ha Ash Dyke-198 ha ,Colony-56ha. No additional area will be acquired for Phase-II including requirement for fly ash disposal.	Complied with.
(vii)	Noise level should be limited to 85 dBA and regular maintenance of equipments be undertaken. For people working in the area of generator halls & other high noise area, ear plugs should be provided.	The stipulated noise level is being maintained through installed acoustic hoods & enclosures and regular maintenance of equipments. Earplugs & earmuffs have been provided to the employees/workers working in the noise generating areas. .
(viii)	For controlling fugitive dust, regular sprinkling of water in coal handling and other vulnerable areas of the plant should be ensured.	Water spraying is a regular practice in coal handling area and other vulnerable areas of the plant to control fugitive dust emission.
(ix)	A greenbelt of 100 m width will be created all along the plant boundary. Greenbelt will also be created along the ash disposal area. A norm of 1500 -2000 trees per ha should be followed. A detailed proposal of green belt creation including aftercare, gap filling, monitoring etc. should be prepared along with financial requirements and submitted to the Ministry by 31st December, 1997.	A detailed proposal for green belt development had been already submitted to the Ministry. Green belt of approximately 100 m width (depending upon space availability) along the plant boundary is in progress. Greenbelt has also been created along the ash disposal area. Saplings have been planted as per the CPCB guidelines. .
(x)	Continuous monitoring of ground water should be undertaken in project impact area by establishing good network of observation wells in consultation with the Central Ground Water Board. Result & data collected should be analyzed to ascertain the status of water quality and findings should be submitted.	A network of observation wells and piezometers have been established in impact area in consultation with Central Ground Water Board and monitoring the ground water quality at regular intervals. Results are submitted regularly to concerned authorities.

(xi)	All effluents generated in various plant activities should be collected in the Central Effluent Treatment Plant and treated to ensure adherence to specified standards of discharge.	Treated water from the Neutralization pit, Boiler blow down and Cooling tower blow down are being collected to Central Monitoring Basin (Guard pond) and reused in ash slurry preparation. 100% decanted ash water from ash dyke is recirculated and reused for ash slurry preparation.
(xii)	Provision shall be made for collection of fly ash in dry form. Close conveyor system with dust suppression mechanism shall be used for transport of coal from the mine and for carrying the ash to the disposal areas. Adequate provision should be made for sprinkling of water at strategic locations to ensure that fly ash does not get air borne.	Dry fly ash is collected through pneumatic conveying system in 2 Nos. of Ash silos of capacity 1600 Tonnes each. Coal is transported from the coal mine to the power plant through closed pipe conveyer system. Pipe conveyor system is free from spillage of coal, hence there is no dust emission during transportation of coal. Dry fly ash is being transported by covered trucks/dumper by maintaining sufficient moisture for utilization in brick manufacturing, land filling, mine backfilling, cement manufacturing etc. Wet ash is disposed to ash dyke through ash slurry pipelines. Water level is always maintained in the ash dyke so that there is no fugitive dust emission generated from the ash dyke.
(xiii)	Ash pond area should be provided with impervious lining and suitable drainage provision should be made around the coal stock yard.	Clay compacted impervious lining layer has been provided to Ash pond area as per CPCB guidelines. Suitable drainage provision with sedimentation pit is made around the coal stockyard.
(xiv)	Fly ash generated will be fully utilized within 10 years starting with 20% utilization from the year of operation of the project with the additional utilization of 10% every year.	Noted by JPL
(xv)	Detailed survey of flora and fauna along Kurkut river/ submergence area shall be carried out in consultation with the institution like BSI, ZSI, WLI, Dehra Dun, local recognized Universities, Institutions etc. and the report should be submitted within six months.	Detailed survey of flora and fauna along Kurket river/ submergence area had been carried out by Prof.A.K.Girolkar, Principal & Professor (Botany), K.G. Science & Arts College, Raigarh, Chhattisgarh. The report has already been submitted to the Ministry.

(xvi)	Project affected people should be adequately compensated and rehabilitated as per the State Govt. norms in consultation with the State authorities. The final R&R Programme and package should be submitted within six months. The project colony should be located 6-8 kms away from the plant site to avoid direct impact of the project.	All land holders affected by the project have been compensated as per directives of State Govt. of C.G. No R&R issue is pending. The colony is located at 6.5 km away from the plant site in upwind direction.
(xvii)	Adequate financial provision should be made for implementation of environmental mitigative measures with adequate scope for its enhancement, if required in future.	Complied as per EMP provided in the EIA Report.
(xiii)	Regular monitoring for SPM, SO_2 and NOx around the power plant may be carried out and records maintained. The data so collected should be properly analysed and submitted to the Ministry every six months.	Regular monitoring is being carried out for the PM10, $PM_{2.5}$, SO_2, NOx and CO in and around the power plant and records are properly maintained.
(xix)	Full cooperation should be extended to the Scientists/ Officers from the Regional Office of the Ministry at Bhopal/ the CPCB/ the SPCB who would be monitoring the compliance of environmental status. Complete set of impact assessment report and the Management Plans should be forwarded to the Regional Office/ the CPCB/ the SPCB for their use during monitoring.	Noted by JPL.
(xx)	Monitoring Committee should be constituted for reviewing the compliance to various safeguard measures by involving recognized local NGOs, Pollution Control Boards, Institutions, Experts etc.	Request letter for formation of Monitoring Committee is already submitted to Chhattisgarh Environment Conservation Board(CECB), Regional Office vide letter No.JPL/EMD/RO/OCT-2010 dated 7/10/2010.
3	The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry.	Noted by JPL

4	In case of any deviation or alteration in the project from proposed those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the condition(S) imposed and to add additional environmental protection measures required, if any.	Noted by JPL
5	The above stipulations shall be enforced among others as under the water (Prevention and Control of Pollution) Act, 1974 , the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act,1986, the Public Liability Insurance Act,1991 and rules there under, the Environment Impact Assessment notification of January ,1994 and its amendments.	Noted by JPL
	Additional Conditions (as per MoEF&CC/GOI Memorandum No.J.11013/41/2006-IA.II (I) dated 06.04.2011)	**Compliance Status**
(i)	Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) shall be carried out and continuous records maintained. Based on the monitored data, necessary corrective measures as may be required from time to time shall be taken to ensure that the levels are within permissible limits. The results of monitoring shall also be submitted to the respective Regional Office of MoEF&CC/GOI regularly. Besides, the results of monitoring will also be put on the website of the company in the public domain.	JPL has already been installed opacity meters and 06 Nos. of online ambient air quality monitoring stations for continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) and maintaining continuous records accordingly. JPL have been submitting the results of monitoring to the Regional Office of MoEF&CC/GOI, regularly.
(ii)	The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environment clearance conditions shall be put on the website of the company and also regularly updated.	JPL is submitting the monitoring data to CECB, Raipur, CECB, Raigarh and to the Regional Office of MoEF&CC/GOI, on regular basis.

	The monitored data shall also be submitted to respective State Pollution Control Board/UTPCCs and the Regional Office of MoEF&CC/GOI.	
(iii)	The ambient air quality data as well as the stack emission data will also be displayed in public domain at some prominent place near the main gate of the company and updated in real time.	JPL is displaying the ambient air quality data and the stack emission data near the main gate of the company and updating the same for real time conditions.

13.2 Environmental Compliance Audit of Jindal Thermal Power Plant for Phase- II (2 x 250 MW)

Compliance Report of Environmental Clearance & additional conditions for Stage-II (2x250MW) of O.P.Jindal Super Thermal Power Plant, Tamnar vide letters No.J-13011/8/2006-IA.II(T) dated 8.06.2006 & J-11013/41/2006-IA.II(I) dated 06.04.2011

S. No.	Condition	Compliance status
1.	All the conditions stipulated by Chhattisgarh Environment Conservation Board vide their letter no. 984/TS/CECB/2006 dated 23/02/06 shall be strictly implemented.	All the conditions stipulated by the Chhattisgarh Environment Conservation Board vide their letter no. 984/TS/CECB/2006 dated 23/02/06 are strictly implemented.
2.	No additional land for ash pond shall be acquired during phase-II of the project. The height of the existing ash dyke shall be limited to 10 m.	The area earmarked for ash dyke is 198 Ha. for both Phase-l (2x250MW) & Phase-ll (2x250MW). No additional land is acquired for ash dyke for Phase- ll (2x250MW). The average height of the ash dyke is limited to 10 m.
3.	A 500 m distance from State highway and HFL of river Kelo to the plant site, ash pond and Township must be kept.	Complied with by JPL.
4.	A copy of the requisite clearances from state government for construction of Rabo dam on Kurket River shall be submitted within one month of the receipt of this letter.	Copy of the requisite clearances from State Government for construction of Rabo dam on Kurket river has been already submitted to MoEF, New Delhi vide Letter No .AB/1000 MW/MoEF/509/001, dated 16/06/2006.
5.	Ash in the coal to be used as fuel shall not exceed 40%.	Noted by JPL

6.	Copy of coal linkage and stack height clearance shall be submitted within one month to the Ministry.	Complied by JPL.
7.	A bi-flue stack of height 220 m and internal diameter of 4.75 m with continuous On-line monitoring system shall be installed. For adequate dispersal of gaseous pollutants, exit velocity shall be maintained at 25 m/sec by installing ID fans and continuous record of exit velocity shall also be maintained and submitted to the Ministry on a 6 monthly basis.	A bi-flue stack of height 220 m and internal diameter of 4.75 m with continuous on-line monitoring system has already been installed. ID fans are installed and exit velocity of 25 m/s is maintained.
8.	Electrostatic Precipitators (ESPs) with an efficiency of 99.9% efficiency shall be installed to limit particulate emission within 50 mg/Nm3. Automatic system for shutting down the power plant in the event of non-functioning of ESPs shall be installed.	Electrostatic Precipitators (ESPs) with an efficiency of >99.9% have been installed. The ESP's are designed to achieve particulate emission below 50 mg/Nm3.
9.	100% fly ash utilization shall be achieved within 9 years in accordance with the notification on fly ash utilization SO 76 (E) dated 14th September, 1999 and the amendments made therein form time to time.	Noted by JPL
10.	COC of not less than 5 shall be adopted. No ground water shall be used for any purpose.	COC > 5 is being maintained. No ground water is utilized in plant for any purpose.
11.	The treated effluents conforming to the prescribed standards shall be recirculated and reused within the plant. There shall be no waste water discharge into the surface water bodies, outside the plant boundary.	Treated effluents conforming to prescribed standards are re-circulated and re-used within the plant. Effluents are treated in Central Monitoring Basin (Guard pond) and are re-used in ash slurry preparation. No wastewater is being discharged into the surface water bodies, outside the plant boundary.
12.	Rain water harvesting shall be adopted and a detailed scheme for rain water harvesting to recharge the ground water aquifer shall be prepared in consultation with Central Ground Water Authority/ State Ground Water Board. A copy of the same shall be submitted within three	Water reservoir of 35 million cu.m capacity at the Rabo dam and 12 lakh cu.m capacity at plant site have been constructed. Rainwater harvesting technique has been adopted in the residential colony and other office complexes at the site, as per proposal prepared in consultation with Mr. V.K. Jain, formerly

	months to the Ministry	Engineer-In-Chief, Public Health Engineering Department and Chairman, M.P. Pollution Control Board, Bhopal and as per the guidelines of Central Ground Water Authority/ State Ground Water Board. The report had been submitted to the Ministry vide letter No.JPL/RTPP/RKS/2.5/1897 dated 19/09/2006.
13.	Continuous monitoring of ground water shall be undertaken in and around project impact area including ash pond area by establishing a network of observation wells in consultation with the Central Ground Water Board/ State Ground Water Board, as the ash pond lies in the catchment of river Pajhar. Data collected shall be analyzed to ascertain the status of water quality and results furnished to the Regional Office of this Ministry.	A network of observation wells and piezometers have been established in and around impact area including ash pond in consultation with Central Ground Water Board and monitoring the ground water quality at regular intervals. Results are submitted regularly to Ministry & its Regional Office, CPCB zonal office and CECB-Raipur.
14.	(As amended vide MoEF&CC/GOI letter no. J-13011/8/2006-IA. II (T) dt. 25/04/07) A greenbelt of 100 m width shall be developed all around the power plant covering approximately 1/3rd of power plant area. Greenbelt with an average width of 45 m shall also be developed around the ash dyke covering about 24 ha area.	Green belt of approximately 100 m width (depending upon space availability) along the plant boundary is in progress. 45 m wide green belt around the ash pond is developed.
15.	The project proponent shall take all precautionary measures during construction and operation of power plant for conservation and protection of endangered faunal species i.e. Sloth Bear (Melursus ursinus), Common Jungle Cat (Felis chaus), Indian Python (Python molurus), Rat Snake (Ptysus mucosus), Indian Cobra (Naja naja), Lizard (Varanus monitor) etc, reported in the study area, in consultation with the state Wildlife Dept. Action plan for conservation of endangered fauna shall be prepared and submitted to the Ministry & its Regional Office within 3 months.	A proposal for conservation of endangered wild life fauna species was prepared in consultation with State Wild Life Department, Raipur as per the guidelines of Wild Life Protection Act, 1972 and the same was submitted to the Ministry vide letter No.JPL/RTPP/RKS/2.5/1897 dated 19/09/2006.

16.	First aid and sanitation arrangements shall be made for the drivers and other contract workers during the construction phase.	Complied with.
17.	Leq of Noise level shall be limited to 75 dBA and regular maintenance of equipment be undertaken. For people working in the high noise areas, personal protection devices should be provided.	Noise level is being maintained within the prescribed limit. Earplugs & Earmuffs have been provided to the employees/workers working in the noise generating areas.
18.	Regular monitoring of the ambient air quality shall be carried out in and around the power plant and records maintained. Periodic six monthly reports should be submitted to the Regional Office of this Ministry.	Ambient air quality is being monitored in and around the power plant and records are being maintained. The reports are being submitted to the Regional Office of Ministry regularly in every six months.
19.	For controlling fugitive dust, regular sprinkling of water in coal storage area and other vulnerable areas of the plant shall be ensured.	Water spraying is a regular practice in coal handling area and other vulnerable areas of the plant to control fugitive dust.
20.	The project proponent should advertise in at least two local newspapers widely circulated in the region around the project, one of which should be in the vernacular language of the locality concerned, informing that the project has been accorded environmental clearance and copies of clearances letters are available with the State Pollution Control Board/ Committee and may also be seen at Website of the MOEF&CC/GOI http://envfor.nic.in.	The information regarding advertisement in two local newspapers informing the project has been accorded environmental clearance has been sent to MoEF&CC/GOI, New Delhi vide Letter No. AG/1000MW/MoEF/509/002,dt. 24/06/2006.
21.	A separate environment monitoring cell with suitable qualified staff should be set up for implementation of the stipulated environmental safeguards.	Environment Management Department is already in place with qualified and experienced staff for implementation of the stipulated environmental safeguards.
22.	Half yearly report on the status of implementation of the stipulated conditions and environmental safeguards should be submitted to this Ministry/ Regional Office/ CPCB/ SPCB.	Half yearly report on the status of implementation of the stipulated conditions and environmental safeguards is being submitted to MOEF&CC/GOI, Regional Office of Ministry, CPCB and SPCB.
23.	Regional Office of the MOEF&CC/GOI located at Bhopal will monitor the implementation of the stipulated	Noted.

	conditions. Complete set of 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 during monitoring.	
24.	Separate funds should be allocated for implementation of environmental protection measures along with item-wise break-up. This cost should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	Separate fund for implementation of environmental protection measures have been allocated as part of the project cost. Year wise (April to March) expenditure details are being submitted regularly to the Ministry.
25.	Full cooperation should be extended to the Scientists/ Officers from the Ministry/ Regional Office of the Ministry at Bhopal/ the CPCB/ the SPCB who would be monitoring the compliance of environmental status.	Noted.
26.	The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry	Noted.
27.	The environmental clearance accorded shall be valid for a period of 5 years for starting construction/Operation of the power plant. In case, the project authorities fall to do so within this stipulated period, the environmental clearance shall stand lapsed automatically	Plant has been constructed/operated within the stipulated period. The Unit-1,2,3 & 4 were commissioned on 08/12/2007, 15/06/2008, 06/04/2008 & 05/09/2008 respectively.
28.	In case of any deviation or alteration in the project from proposed those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.	Noted by JPL.
29.	The above stipulations shall be enforced along with others as under the water (Prevention and control of pollution) Act	Noted by JPL.

	1974, the Air (Prevention and control of pollution) Act 1981, the Environment (Protection) Act, 1986,Hazardous Wastes (Management and Handling) Rules, 1989, the Public Liability Insurance Act, 1991 and rules there under, the Environment Impact Assessment notification of January, 1994 and their subsequent amendments	
30.	**Additional Conditions (as per MoEF Circular vide letter No.J.11013/41/2006-IA.II (I) dated 06.04.2011)**	**Compliance Status**
30.1	Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) shall be carried out and continuous records maintained. Based on the monitored data, necessary corrective measures as may be required from time to time shall be taken to ensure that the levels are within permissible limits. The results of monitoring shall also be submitted to the respective Regional Office of MoEF&CC/GOI regularly. Besides, the results of monitoring will also be put on the website of the company in the public domain.	Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) is being carried out and continuous records are maintained. Results of monitoring are being submitted to the Regional Office of MoEF&CC/GOI regularly. Results of monitoring are being regularly uploaded on website of JPL.
30.2	The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environment clearance conditions shall be put on the website of the company and also regularly updated. The monitored data shall also be submitted to respective Sate Pollution Control Board/UTPCCs and the Regional Office of MoEF&CC/GOI.	The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environmental clearance conditions is being regularly uploaded on website. Monitored data are being regularly submitted to CECB-Raipur and the Regional Office of MoEF&CC/GOI.
30.3	The ambient air quality data as well as the stack emission data will also be displayed in public domain at some prominent place near the main gate of the company and updated in real time.	Ambient air quality data and the stack emission data is being displayed near the Plant main gate of the company and updated in real time.

13.4 Compliance Report of Environmental Clearance and additional conditions for Expansion of 4x250MW by addition of 2x600 MW (Units-1 & 2) Coal Based Thermal Power Plant, Tamnar vide letters No.J.13012/117/2008-IA.II (T) & J.11013/41/2006-IA.II (I) dated 18/03/2011 & 06/04/2011, amendment vide letter No.J.13012/117/2008-IA.II (T) dated 10/01/2014 and 27.03.2015

S.No	Specific Conditions	Compliance Status
A. Specific conditions :		
(i)	Environmental clearance shall be applicable for 2x600 MW. However at a later stage when firm coal linkage for third and fourth unit of 600 MW are also available, the project proponent may request the Ministry for inclusion of these units of 600 MW each, for which the Ministry shall consider appropriately.	Ministry has granted Environmental Clearance for 2x600 MW (Units-3&4) vide Letter No.J-13012/117/2008-IA.II (T) dated 04/11/2011.
(ii)	**(As amended vide MoEF&CC/GOI letter No. J-13012/117/2008-IA. II (T) dt. 4/11/2011)** Prior permission/clearance from the Ministry of Coal shall be obtained before undertaking construction activity for the expansion project.	Permission has been obtained from Ministry of Coal vide letter dated 01/11/2011.
(iii)	Vision document specifying prospective plan for the site shall be formulated and submitted to the Ministry within six months.	Vision document has been submitted to the Ministry & its Regional Office-Bhopal vide letter No. JPL/EMD/2x600MW/2011/194 dated 10/09/2011.
(iv)	Provision for installation of FGD shall be provided for future use.	Space provision has been provided for installation of FGD in future use.
(v)	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm^3. 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 vulnerable dusty areas shall be provided.	The ESP's are designed to achieve particulate emission below 50 mg/Nm3. Adequate dust extraction system and dust suppression system in coal handling and ash handling points, transfer areas and other vulnerable dusty areas have been provided.

(vi)	Sulphur and ash contents in the coal to be used in the project shall not exceed 0.5 % and 34 % respectively at any given time. In case of variation of coal quality at any point of time fresh reference shall be made to MoEF for suitable amendments to environmental clearance condition wherever necessary.	Noted by JPL.
(vii)	Stack of 275 m height shall be installed and provided with continuous online monitoring equipments for SO_x, NO_x and Particulate Matter. Exit velocity of flue gases shall not be less than 22 m/sec. Mercury emissions from stack may also monitored on periodic basis.	Twin flue stacks of 275 meters height with continuous online monitoring instrument for SOx, NOx and Particulate Matter have been provided at Unit-1, Unit-2 & Unit-3 & Unit-4. COD for Unit-1 is on 14.03.2014, COD for Unit-2 is on 31.03.2014, COD for Unit-3 is on 15.01.2015 & COD for Unit-4 is on 12.12.2016 and flue gas exit velocity of 22 m/sec is being maintained. Mercury emissions from stack is being monitored periodically.
(viii)	Existing de-generated water bodies (if any) in the study area shall be regenerated at the project proponent's expenses in consultation with the state Govt.	Revival/regeneration of 32 nos. of water bodies by de-silting /deepening in the study area has already been done under CSR activities in consultation with District administration.
(ix)	Detailed hydro-geological study shall be conducted (including sustainability of water source study) shall be carried out by an institute of repute and report submitted to the Regional Office (RO) of the ministry. Further hydro-geological study shall be reviewed annually from an institute/ organization of repute to assess impact of surface water and ground regime (especially around ash dyke). In case and deterioration is observed specific mitigation measures shall be undertaken and reports/ data of water quality monitored regularly and maintained shall be submitted to the RO of the Ministry.	National Institute of Hydrology (NIH),Roorkee has carried out detailed Hydro-geological study .The report was submitted to MoEF&CC/GOI and its Regional Office vide letter No. JPL/EMD/4x600MW/2011/228 dated 14/12/2011.
(x)	Source of water for meeting the requirement during lean season shall be	Source of water for meeting the requirement during lean season was already specified and

	specified and submitted to the Regional Office of the Ministry within three months.	submitted to the Regional Office of the Ministry vide letter No. JPL/EMD/2x600MW/JULY-11/15 dated 04/07/2011.
(xi)	No ground water shall be extracted for use in operation of the power plant even in lean season.	No ground water was extracted for use in power plant operation.
(xii)	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.	There are no water bodies within the project site.
(xiii)	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.	Will be complied, whenever stipulated.
(xiv)	COC of 5.0 shall be adopted. 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. A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation.	Cooling water system with COC of 5.0 is being adopted. Separate storm water drains are provided, hence there is no chance of mixing of effluents with storm water . The project has been designed with zero discharge concept. As stipulated, treated sewage is being used completely for raising greenbelt/plantation purpose.
(xv)	Additional soil for leveling of the proposed site shall be generated within the sites (to the extent possible) so that natural drainage system of the area is protected and improved.	Topography of the site is more or less flat. Therefore leveling works are not required.
(xvi)	Utilisation of 100% Fly Ash generated shall be made from 4th year of operation. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.	Noted, Implementation status report is being submitted time to time.

(xvii)	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized fly ash shall be disposed off in the ash pond in the form of slurry form. Mercury and other heavy metals (As,Hg, Cr, 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 off in low lying area.	JPL incorporated total ash utilization as integral part of the project. We have installed dry fly ash extraction system with silos of adequate capacity 2300 Tonnes each so that ash generated during the power generation is collected in dry form. Unutilized fly ash is being disposed off in the ash dyke in the form of slurry. Mercury & other heavy metals (As, Hg, Cr, Pb etc.) is being monitored in the bottom ash and in the effluents emanating from the existing ash pond.
(xviii)	Ash pond shall be lined with HDP/LDPE 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.	Noted by JPL, HDP/LDPE lining will be carried out in the proposed Ash dyke.
(xix)	Disposal of Bottom Ash in abandoned mines (if proposed to be undertaken) shall be carried out only after obtaining permission from DGMS and 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.	Noted by JPL, Permission from DGMS will be obtained for disposal of Bottom Ash in abundant mines.
(xx)	Green Belt consisting of 3 tiers of plantations of native species around plant and at least 100 m width shall be raised. Wherever 100 m width is not feasible adequate Green Belt shall be raised and detail justification shall be submitted to the Ministry. Tree density shall not less than 2500 per ha with survival rate not less than 85 %.	Action plan for green belt development and details regarding the feasibility of green belt development was submitted to Ministry & its Regional office vide letter Nos.JPL/EMD/2x600MW/JULY-11/156 & . No.JPL/EMD/4x600MW/2012/359 dated 04/07/2011 & 01/12/2012. Wide Green belt consisting of three tiers of plantation of broad leaf local species of 100 meter width all along the periphery of the plant is being developed/ strengthened on continuous basis.
(xxi)	The project proponent shall also	JPL under its CSR activities has undertaken

	adequately contribute in the development of the neighboring 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.	several community development programmes for fulfillment of the basic needs of the neighboring villagers. Further as per Govt. PHE department survey, all the neighboring villages of project area are free from fluoride contaminated water, hence there is no need to supply fluoride free potable drinking water in the villages and schools. However, JPL has renovated 04 Nos. of ponds under its CSR.
(xxii)	Further an amount of at least 0.4% of the cost of the project (for 2x600 MW) shall be earmarked as one time capital cost for CSR programme as committed by the project proponent. Subsequently a recurring expenditure $1/5^{th}$ of the above per annum shall be earmarked till the operation of plant as recurring expenditure for CSR activities. Details of the activities to be undertaken shall be submitted within six month along with road map for implementation.	Complied with.
(xxiii)	While identifying CSR activities it shall be ensured that need based assessment for the nearby villages within study area shall be conducted to study economic measures with action plan which can help in upliftment of poor section of society. Income generating projects consistent with the traditional skills of the people shall be undertaken. 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. Vocational training programme for possible self employment and jobs shall be imparted to identified villagers free of cost.	The CSR plan for the year 2017-18 has been prepared and subsequently the work plans have been rolled out in the field. The activities are being implemented under the following thematic heads: 1.Health 2.Education Support 3. Infrastructure Development 4.Livelihood 5. Livestock Management 6. Environment 7. Youth, Art and Culture

(xxiv)	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.	To ensure the schemes operating well, the organization has its own in-built monitoring cell. The Impact study through Community Satisfaction Index is being carried out by NABCONS (NABARD Consultation Pvt. Ltd.).
(xxv)	For the tribal families affected directly or indirectly (if any) by the proposed project, specific schemes for up-liftment of their sustainable livelihood shall be prepared with time bound implementation and in-built monitoring programme. The status of implementation shall be submitted to the Regional Office of the Ministry from time to time.	Schemes for the tribal families are being implemented.
(xxvi)	Information on all new activities like proposed settling up of a Coal Handling Plant, a Coal Gasification Plant, Coal stock yard etc. including the proposed pipe coal conveyer from Prasada to M/s JPL, at Tamnar shall be brought to the notice of the people both through EIA/EMP studies and at the time of the Public hearing for the proposed Steel Plant of M/s JSPL in an explicit, comprehensive and understandable fashion.. However as an interim arrangement as the above may take some time, the coal handling plant may be setup at the thermal power site for crushing coal obtained from SECL and MCL mines located between 20-50 Kms distances. The coal crusher at the plant site is permitted as an interim measure and would be dismantled after the lapse of interim period of three years. The transportation of coal from these mines by road may be undertaken for a limited period of three years from the date of	JPL has applied to MOEF vide letter No.JPL/Tamnar/2012,dated 31.08.2012 for permitting the installation of coal crusher within the plant and transportation of coal by road, till permanent system of coal handling and coal transportation through Closed Pipe Conveyer (CCPC), as envisaged in environment clearance, is in place. MoEF&CC/GOI has amended EC with respect to coal transportation by road, installation of coal crusher within plant site on 10th January 2014 for three years i.e up to 9th January 2017. JPL has obtained amendment in EC from MoEF&CC/GOI on 26.04.2017 for coal transportation by road & coal crushing facility within plant site for 30 months, permission to use existing water reservoir is permitted and ash dyke of operating 1000 MW power plant for two more years.

	issue of this letter, by which time the pipe conveyer shall be put in place for coal transportation".	
(xxvii)	Power generated from Unit-1&2 (2x600 MW) domestic coal linkage, shall be sold / supplied on tariff based bidding or through competitive bidding route on long term Power Purchase Agreement with State distribution companies (DISCOMS).	Noted, Power is being supply from unit-1 & 2 of 600 mw through long term PPA to KSEB, TNEB, CSEB.
xxviii)	Avenue plantation along the route (both sides of the road) of coal transportation from SECL and MCL mines over distances varying from 20 to 50 kms shall be raised by the project proponent at its own cost. The status of implementation shall be submitted to the Regional Office of the Ministry.	Avenue plantation along the route (both sides of the road) of coal transportation from SECL and MCL mines is being done on continuous basis.
xxix)	It shall be ensured that only mechanized covered trucks are used for coal transportation	Noted for compliance.
xxx)	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.	The study on radioactivity is analyzed by BARC for determination of Radioactivity in Coal and fly ash. Study of heavy metals contents in coal and fly ash from a reputed institute/organization is carried out regularly. Study report is already submitted to MoEF&CC/GOI.
xxxi)	Recommendation made by CEA in its report for setting up of crusher and dumper hopper as given under shall be strictly implemented: • The dust extraction / collection and suppression facilities to be installed at the coal crushing site.	Water sprinkling systems have been installed at crushers area, transfer points etc to control fugitive dust emissions. Dust extraction system equipped with 02 bag filters has already been installed.
xxxii)	The existing water reservoir and water allocation for the existing 1000 MW plant	JPL has obtained amendment in EC from MoEF&CC/GOI on 26.04.2017 for use existing

	shall be utilized for an interim period not exceeding three years by which time the system shall be put in place for self sustenance of the expansion units	water reservoir 1000 MW power plant.
xxxiii)	The existing ash dyke shall be utilized for the expansion for an interim period not exceeding three years subject to ash dyke having necessary capacity to handle additional ash on account of the expansion units. A new ash dyke shall be constructed within three years to meet the requirement of substantial quantity of ash that would be generated by the expansion plant.	JPL has obtained amendment in EC from MoEF&CC/GOI on 26.04.2017 for use existing ash dyke of operating 1000 MW power plant for two more years.
(xxxiv)	The coal transportation by road shall be through mechanically covered trucks only.	Noted for compliance
(xxxv)	Avenue plantation of 2/3 rows all along the coal transportation route (both side of the road shall be carried out by the project proponent at its own expenses and in consultation with the state Government Authorities. The status of the implementation shall be submitted to the Regional Office of the Ministry.	Avenue plantation along the route (both sides of the road) of coal transportation from SECL and MCL mines is being done on continuous basis.
(xxxvi)	Periodic maintenance of the road for coal transportation shall be done by the project proponent at its own expenses and shall also facilitate the traffic control on the road in consultation with the state Government Authorities.	Complied with
(xxxvii)	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.	25 KW roof top solar systems has been installed for solar power generation & 50 nos solar street lights has been installed at residential colony. A solar steam cooking system has been installed for preparation of 500 meals per day.

(xxv)	Fugitive emission shall be controlled to prevent impact on agricultural or non-agricultural land.	All the steps are being taken to avoid the fugitive dust generation and its suppression
xxvi)	Fly ash shall not be used for agriculture 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.	Noted for compliance
xxvii)	Green belt shall also be developed around the Ash Pond over and above the Green Belt around the plant boundary.	Noted, Green belt will be develop around the proposed new Ash dyke.
xxxviii)	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 condition stipulated in this clearance letter and other applicable environment laws and regulations.	Complied. Policy is already in place and is being complied with.
B	**General Conditions**	**Compliance Status**
(i)	A well designed rainwater harvesting shall be put in place before commissioning of the plant. Central Groundwater Authority/ Board shall be consulted for finalization of appropriate rainwater harvesting technology/design within a period of three months from the date of this clearance and details shall be	A detailed scheme for rainwater harvesting to recharge the ground water aquifer has been prepared in consultation with Central Ground Water Board-New Delhi & Central Ground Water Board-Raipur by engaging National Institute of Hydrology, Roorkee and copy of the same has already been submitted to the Ministry of Environment and Forests, Government of India,

	furnished.	Head Office and Regional Office, Bhopal, Chhattisgarh Environment Conservation Board vide Letter No. JPL/EMD/4x600MW/2011/228 dated 26/12/2011. The scheme has been approved by Central Ground Water Board, Raipur vide Letter No. 30-11/Compliance/CGWA/NCCR/TS/075 dated 28/10/2013. The drawing of RWH system has been finalized and the same implementation. A rain water harvesting pond capacity of 35,000 m3 has been made for rainwater harvesting and to recharge the ground water table.
(ii)	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.	Drawing & documents have been finalized and the same was submitted to the Ministry as well as to the Regional Office of the Ministry vide letter No.JPL/EMD/4x600MW/2013/497 dated 24.10.2013. As per scheme, adequate safety measures like hydrant points and water monitor points, etc are installed in and around the coal yard and project area.
(iii)	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.	Petroleum & Explosives Safety Organisation (PESO), Nagpur has granted licence for storage of 1200 KL LDO within the plant area vide letter dated 29/10/2012. Disaster Management Plan, risk assessment & emergency response plan has already incorporated in the Final EIA report.
(iv)	Regular monitoring of ground water level 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	A network of existing wells is being established and piezometers are constructed for ground water level and quality monitoring in consultation with Central Ground Water Board. Piezometers will be installed around the ash dyke for monitoring the ground water as stipulated.

	not adversely affected due to the project.	
(v)	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.	Complied.
(vi)	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	Complied.
(vii)	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.	Noise level is being maintained within the prescribed limit. Earplugs & Earmuffs have been provided to the employees working in the high noise areas.
(viii)	Regular monitoring of ambient air ground level concentration of SO_2, NOx, $PM_{2.5}$ & PM_{10} and Hg shall be carried out in the impact zone and records maintained. If 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	The location of the Ambient Air Quality Monitoring (AAQM) Stations and frequency of monitoring has already been decided in consultation with CECB-Raipur. SO_2, NOx, PM2.5 & PM10 in Ambient Air are being monitored in and around the power plant and records are being maintained.

	Regional Office of this Ministry. The data shall also be put on the website of the company.	
(ix)	Provision shall be made for the housing of construction labour (as applicable) 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 structures to be removed after the completion of the project.	Complied.
(x)	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.	Information regarding grant of Environmental Clearance has already been advertised in two local newspapers (Kelo Pravah in vernacular language and Nav Bharat in English) on 23/03/2011 & 24/03/11 respectively. The copies of advertisements were already submitted to Regional Office of Ministry vide letter No.JPL/EMD/2X600MW/MAY-11/137 dated 24/05/2011.
(xi)	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / 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.	A copy of the clearance letter has already been sent to concerned District Panchayats and NGO vide letter dated 07/04/2011. The clearance letter has already been uploaded on website of JPL.
(xii)	An Environmental Cell shall be created at the project site itself and shall be headed by an officer of appropriate seniority and	Well equipped Environmental Cell at JPL, headed by Senior Executive directly reporting to the head of the project is already in place.

	qualification. It shall be ensured that the head of the Cell shall directly report to the head of the organization.	
(xiii)	The proponent shall upload the status of compliance of the stipulated environmental clearance 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; SPM, RSPM ($PM_{2.5}$ & PM_{10}), SO_2, NO_x (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.	Compliance of the stipulated environmental clearance conditions is being regularly uploaded on website of JPL. Compliance report is being submitted to the Regional Office of MoEF&CC/GOI, Zonal Office of CPCB, Bhopal and the CECB, Raipur.
(xiv)	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 also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.	The environmental statement for the financial year 2016-17 has been submitted to State Pollution Control Board (CECB, Raipur) on 20th September 2017. Status of compliance of environmental clearance conditions is being regularly uploaded on website of JPL.
(xv)	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 environment of the environmental clearance conditions on	Compliance report is being submitted to the Regional Office of MoEF&CC/GOI, Zonal Office of CPCB, Bhopal and CECB, Raipur. The same was sent by e-mail to the Regional Office of MoEF&CC/GOI. Status of compliance of environmental clearance condition is being regularly uploaded on website of JPL.

	their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests.	
(xvi)	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 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 basis. Criteria pollutants levels including NO_x (from stack & ambient air) shall be displayed at the main gate of the power plant.	A complete set of documents including EIA Report and EMP along with the additional information to the Regional Office will be provided for use Regional office of MoEF&CC/GOI, Bhopal during monitoring. Compliance status is being regularly uploaded on website of JPL. The data including NOx is being displayed at the Main Gate of the power plant.
(xvii)	Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost 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.	Separate fund has been allocated for implementation of environmental protection measures and cost is included as part of the project cost. The fund earmarked for the environment protection measures with item-wise break-up was submitted to Regional Office of Ministry vide letter No.JPL/EMD/2X600MW/MAY-11/137 dated 24/05/2011. The fund earmarked for the environment protection measures will not be diverted for other purposes.
(xviii)	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.	Grant of Permission to establish by CECB, Raipur and date of start of development work has already been informed to Regional Office as well as the Ministry vide letter No.JPL/EMD/4x600MW/2011/231 dated 27/12/2011. The COD (commercial operation declaration) of Unit-1, 2, 3 & 4 are 14.03.2014, 31.03.2014, 15.01.2015 & 12.12.2016

		respectively.
(xix)	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 the compliance of environmental status.	Noted.
7	The Ministry of Environment and Forests reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry. The Ministry may also impose additional environmental conditions or modify the existing ones, if necessary.	Noted.
8	The environmental clearance accorded shall be valid for a period of 5 years to start operations by the power plant.	Noted.
9	Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Noted.
10	In case of any deviation or alteration in the project proposed including coal transportation system from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.	Noted.
11	The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment	Noted.

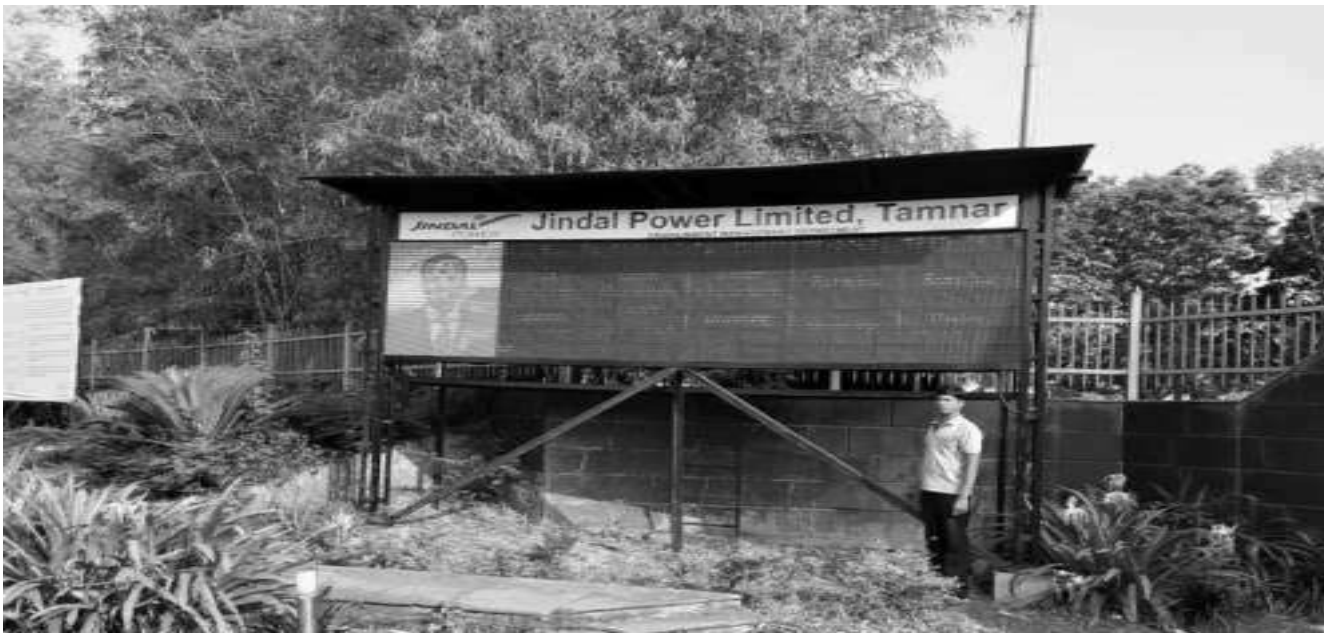
	(Protection) Act, 1986 and rules there under, Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and its amendments, the Public Liability Insurance Act, 1991 and its amendments.	
	Additional Conditions	**Compliance Status**
I	Use of existing ash dyke is permitted for two more years.	Noted.
Ii	Transport coal by road and installation of crushing facility located within the plant premises for thirty months for all the units.	Noted.
Iii	Use of existing water reservoir for expansion of 4X250 MW TPS is permitted.	Noted.
Iv	Change in coal source from imported to domestic coal for Units 3 & 4 is allowed. Coal source from Kulda OCP-MCL (Road: 42 km, CCPC: 7 km), Gare Pelma-IV/ 1, IV/ -2 & IV/ -3-SECL (CCPC: 7 km), Baroud Mines-SECL (Road: 40 km) and Chhal Mine-SECL (Road: 49 km) mines is permitted. Total quantity of coal to be transported through road/CCPC shall not exceed 4.81 MTPA for Unit-3&4 (2x600 MW).	Noted.
V	Details of coal characteristics, source & location of coal mine, traffic study shall be submitted to the Ministry after getting allocation of coal through forward e-auction or any other scheme notified by M/s Coal India Limited.	Coal is being sourced from the above mentioned mines in condition (iv). However, the Company will submit details as & when source of coal is changed.
Vi	Coal transportation shall be preferably by rail or pipe/belt conveyor after thirty months only.	Noted.

Vii	Any variance in coal characteristics/source/mode of transport, it shall be brought along with environment and traffic impact assessment study to the Ministry for assessing the adequacy of the conditions already stipulated or to incorporate any additional condition as may be necessary in the interest of environment protection.	Noted.
Viii	Change in location of ash dyke from Rodapalli to near Dolesara village is allowed.	Noted.
Ix	Plantation along CCPC shall be carried out. Fruit bearing, neem and local indigenous species shall be planted.	Noted.
X	MoEF86CC Notification S.O, 3305(E) dated 7.12.2015 shall be implemented with respect to specific water consumption, zero liquid discharge and revised emission standards, as applicable.	Noted.
Xi	MoEF&CC Notification G.S.R 02(E) dated 2.1.2014 regarding use of raw or blended or beneficiated or washed coal with ash content not exceeding 34% shall be complied with, as applicable.	Not applicable since the coal is sourced from mines located at distance of less than 500 Kms
Xii	MoEF&CC/GOI Notifications on flyash utilization S.O. 763(E) dated 14.09.1999, S.O. 979(E) dated 27.08.2003, S.O. 2804(E) dated 3.11.2009, S.O. 254(E) dated 25.01.2016 and subsequent amendments shall be complied with.	Noted.
Xiii	As proposed, ash pond shall be lined with HDPE liner.	Noted, HDP/LDPE lining will be carried out in the proposed Ash dyke.
Xiv	Third party evaluation/ Environment Audit shall be conducted annually for reviewing the compliance conditions stipulated in the clearances along with the	Being complied,

	baseline data/ studies carried out and the audit report shall be submitted to Ministry's Regional office.	
Xv	Compliance of EC/amendment conditions, Environment (Protection) Act, 1986, Rules and MoEF86CC Notifications issued time to time shall be achieved by an Environment Officer to be nominated by the Project Head of the Company who shall be responsible for implementation and necessary compliance timely.	GM (Env) is responsible for implementation of EC conditions, EPA rules and MoEF notifications. He is directly reporting to Project head.
	Compliance Report of Environmental Clearance for Expansion of 4x250 MW by addition of 2x600 MW (Units-3& 4) Coal Based Thermal Power Plant ,Tamnar issued vide letter No.J.13012/117/2008-IA.II (T) dated 04/11/2011 and amendment vide letter No.J.13012/117/2008-IA.II (T) dated 10/01/2014.	
A	**Conditions**	**Compliance Status**
(i)	The company shall comply with all the conditions stipulated in environmental clearance of even no. dated 18.03.2011 except the specific condition no.i	All the conditions stipulated in environmental clearance of even no. dated 18/03/2011 has been complied.
(ii)	Prior permission/clearance from the Ministry of Coal shall be obtained before undertaking construction activity for the expansion project.	Permission has been obtained from Ministry of Coal vide letter dated 01/11/2011 and construction is in progress.
(iii)	In case source of fuel supply is to be changed at a later stage for the proposed 2x600 MW (Units 3 and 4) now proposed to be run on imported coal from M/s JSPL Mozambique Minerals LDA, the project proponent shall intimate the Ministry well in advance along with necessary requisite documents for its concurrence for allowing the change.	Noted.

Glimpses of Environmental Measures at TPP

Main Gate of JPL, Tamnar



Online Continuous Monitor LED Board at Main Gate of JPL, Tamnar

Online AAQ station

Ash Silos with Bag filters

CHP area & Water sprinkling system at coal yard

Fly ash brick Manufacturing Plant

Plantation after Sericulture area development with Fly ash

Ash Pond

Stacker cum reclaimer

Sewage Treatment Plant

Road sweeping Van

Cover truces

Water spraying before Coal unloading

Tree Transplanter

Green belt with landscape at the Plant

Plantation within Plant with scenic, aesthetic and ecological aspects

14.0 OBSERVATIONS

The comprehensive audit of the Jindal Power Ltd., for assessing the existing environmental performance of the plant, in context to the environmental clearance (EC) conditions imposed by Ministry of Environment, Forests and Climate Change/Government of India (MoEF&CC/GOI), and Consent to Operate conditions stipulated by CECB, revealed that the power plants and Rabo dam area are complying all the conditions. JPL has established a bench mark by installation of Continuous Ambient Air Quality Monitoring (CAAQM) stations and online opacity meter for monitoring the ambient air quality in and around the plant premises and stack emissions, respectively. The observed monthly avg. online AAQ data on for FY 2020-21 at Switch yard location are given in Table-5. The data is well within compare to permissible limit. Jindal Power Ltd. is equipped with state of the art type Environmental Laboratory with adequate monitoring and analysis equipment as per the Chhattisgarh Environmental Conservation Board (CECB) guidelines. Continuous monitoring of different components of environment i.e. air, water, soil, noise etc. is conducted on regular basis to assess the environmental quality and exercise suitable mitigative measures if necessary. Jindal Power plant have shown one of the best examples of sustainable development concepts like reuse and recycling of water by maintaining a zero discharge, water augmentation measures by proper rain water harvesting. Air pollution control devices with benchmark efficiency (Electro-Static Precipitators (BHEL make) with 99.9% efficiency) with online monitoring system have been installed for controlling the emission levels through the stack. The average observed online Opacity meter readings on 23/03/2021 and 24/03/2021 are given in **Table-6**. To avoid the fugitive emissions, JPL has adopted latest state of art type Cross Country Pipe Conveyor for transportation of coal from mine to plant in addition to regular water sprinkling and green belt development. The noise level within the Thermal Power Plant is being maintained within the prescribed limit through installation of acoustic hoods & enclosures at turbines, compressor, motors etc. in various sections of their plant. In addition, the workers engaged in high noise zones i.e. turbine section, blasting and drilling operations, operations of HEMM, etc. are provided with proper earplug/ muffs. In mine, Delays, Relays, NONEL etc. are being used for controlling the noise & vibrations during the blasting operation. Recently JPL has installed 02 nos. of Bag filter at CHP to control fugitive emission. Fly Ash management is done through wet and dry ash collection system and fly ash is utilized in various applications like low land filling, brick, tiles and blocks manufacturing apart. A Fly Ash technology park is also being developed wherein

manufacturing units for fly ash bricks, blocks and tiles are being set up. Not only the protection of environmental quality is being undertaken, the occupational health and safety of the personnel working in the plant and washery is taken care of by providing suitable safety equipments like ear muffs, gloves, helmets, safety masks, belts gumboots etc. to their employees working in critical areas. Housekeeping of Jindal Power Ltd. was found to be up to the mark and appreciable. As a part of CSR, JPL is involved in various activities like providing roads, water tanks, maintenance of school building and temples, provided financial assistance for games, medical, old age pension, cultural, social, health and education, .youth welfare and health. Various campaigns for building environmental consciousness are also carried out on a regular basis by public awareness campaigns, distribution of awareness pamphlets etc. in addition to plantation activities. JPL also observe and celebrate environment events like World Environment Day, Earth Day and Ozone Day through various initiatives. The specific observations of the study are as under:

1. The assessment of ambient air quality through online monitoring stations shows that all the air quality parameters were within the prescribed limits as per NAAQS, 2009. ESPs are working with an efficiency of more than 99.9% to curtail PM_{10} and $PM_{2.5}$ in the ambient air. The concentration range of various air pollutants like PM_{10}, $PM_{2.5}$, SO_2, NO_X & CO in the entire core and buffer zones were found within the prescribed limits. In addition to this, various control measures like green belt development and monitoring, sprinkling of recycled water, construction of WBM roads, covering the coal storage areas, providing the covered conveyers for transportation and handling of coal, etc. have been adopted to control and minimize the other fugitive emissions.

2. M/s Jindal Power plant has established a good bench mark of zero discharge concepts. The entire water demand of the plant is being met from their own Rabo dam built across Kurket River. The water used in the plant is recycled and reused as stated above in the compliance report. No effluent is being discharged outside the plant premises. Treated wastewater from the Neutralization pit, Boiler blow down and cooling tower blow down are reused in ash slurry preparation and decanted ash water from ash dyke after treatment is fully re-circulated and reused for ash slurry preparation. Thus the plant does not cause any significant thrust on surface and ground water resources.

3. M/s JPL has also taken all care to minimize and reduce the causes of water pollution. The industry has installed 3 nos. of sewage treatment plants (500 KLD,150 KLD & 2000 KLD) located near Plant & Colony to take care of the domestic wastewater. The results of treated effluent of STPs at Shaktivihar-1 and ETP are given in **Table-7**. The treated effluent from the plant meets the

effluent discharge standards as per IS 2490 and the same is reused for development of green belt and other plant activities. The water quality of the study area and nearby villages are also regularly monitored which meet with the drinking water quality standards (IS 10500). This indicates that there is least impact of plant on the water quality of existing water resources.

4. Adequate measures are being taken for control of noise levels below 85 dB (A) in the work environment and below 75 dB (A) and 70 dB (A) in plant during day and night time respectively in confirmation to the prescribed noise level norms.

5. Occupational health and safety are on the top priority list of JPL. Periodical medical examinations and all precautionary measures are being taken care in compliance to health & safety norms. Regular training program related to occupational health & safety is being organized by JPL to their employees from time to time. Occupational health surveillance program is being undertaken periodically & corrective measures are adopted. M/s JPL have been awarded by OHSAS 18001 for the best occupational health and safety measures adopted by JPL.

6. A separate Environment Management Department with well-equipped laboratory has also been set up under the control of a highly qualified & experienced GM, who is reporting the environmental performance status of the plant directly to the Head of the Organization.

Table-5: Online monthly Avg. AAQ data –Switch yard location

Month	PM10	PM2.5	SO2	NOx	CO
	µg/m3	µg/m3	µg/m3	µg/m3	mg/m3
Apr-20	51.4	14.6	13.1	20.2	0.47
May-20	61.0	17.0	11.8	20.3	0.46
Jun-20	45.8	14.8	10.6	21.8	0.44
Jul-20	38.9	13.6	8.5	24.9	0.46
Aug-20	27.9	8.3	7.2	33.5	0.47
Sep-20	56.2	18.7	8.2	23.3	0.46
Oct-20	53.9	16.4	9.0	24.9	0.47
Nov-20	58.0	21.9	13.3	26.7	0.50
Dec-20	66.8	25.4	12.2	27.7	0.51
Jan-21	64.9	25.9	12.6	24.1	0.49
Feb-21	58.1	19.8	13.9	24.0	0.48
Mar-21	63.5	19.3	14.0	24.0	0.53

Table-6: Average PM reading in stack emission of all the units

Date	TPP	U# 1			U# 2			U# 3			U# 4		
		PM	SO2	NOx	PM	SO2	NOx	PM	SO2	NOx	PM	SO2	NOx
		mg / Nm^3	mg / Nm^3	mg / Nm^3	mg / Nm^3	mg / Nm^3	mg / Nm^3	mg / Nm^3	mg / Nm^3	mg / Nm^3	mg / Nm^3	mg / Nm^3	mg / Nm^3
23/03/2021	4X250 MW	33.5	1851	409	U/S	U/S	U/S	34.6	1779	229	31.8	1610	245
	4X600 MW	33.2	608	375	32.6	1505	313	32.6	1271	435	U/S	U/S	U/S
24/03/2021	4X250 MW	30.8	U/S	U/S	U/S	U/S	U/S	36.3	1712	261	34.0	1595	241
	4X600 MW	34.5	753	289	34.4	1336	226	34.4	1217	374	U/S	U/S	U/S

U/D: Under Shut down

Table-7: Results of treated effluent of STPs at Shaktivihar-1 &2

Sl. No.	Parameters	Unit	Result		*Permissible Limit
			STP Treated Effluent (Shakti Vihar-1)	ETP Treated Effluent	
1.	pH	-	7.0	7.1	5.5-9.0
2.	TSS	mg/l	20	22	100
3.	COD	mg/l	35	30	250
4.	BOD (3 days at 27°C)	mg/l	7.5	5.0	30

15.0 COMPLIANCE OF SUGGESTIONS GIVEN IN LAST AUDIT REPORT

Sl. No	SUGGESTIONS	COMPLIANCE
1.	As coal is being sourced from different mines, some mechanism such as determining the provision of radial blender to ensure the proper uniform supply of assured quality of feed coal.	Complied with.
2.	JPL may plan for the reclamation of abandoned ash pond sites in future.	Noted for compliance
3.	Strict compliance of new SO2 and NOx standards while improving the quality of coal as feasible; installation of appropriate FGD units, deployment of low NOx burners etc.	JPL will comply the new emission norms with in time frame given GoI notification dated 31.03.2021. The process of the above work has already been started.
4.	To begin on line monitoring of Hg emissions.	Online Hg monitoring system has already been installed in one unit.
5.	To study the feasibility of using alternate to coal to begin with a few percentage of biomass utilization as India has signed the Paris Deal.	The study for feasibility of using alternate to coal to begin with a few percentage of biomass utilization as India has signed the Paris Deal is under progress.

15.0 CONCLUDING REMARKS

Comprehensive & rapid environmental audit of M/s Jindal Thermal Power Plant (2x250 MW & 4X600 MW) including Rabo Dam and 800 TPH Coal Washery with special reference to conditions stipulated by MoEF& CC/GOI in EC & CECB in Consents to Operate delineates that all the above units and washery complies with the stipulated environmental norms & conditions. Based on the review of best management practices are adopted in the country and world over, additional measures as suggested above, may be adopted for enhancing the environmental quality and performance of the plant for long term benefits.


JINDAL
POWER

Annexure-4

Jindal Power Limited, Tamnar

COC for FY 2022-23

Month	4X250 MW TPP	4X600 MW TPP
Apr-22	9.24	9.85
May-22	7.9	8.61
Jun-22	6.2	7.59
Jul-22	7.03	9.01
Aug-22	7.37	9.47
Sep-22	6.85	8.82
Oct-22	6.49	7.61
Nov-22	6.64	7.01
Dec-22	6.28	7.92
Jan-23	6.34	7.65
Feb-23	6.92	7.15
Mar-23	7.12	7.9
Annual Avg. COC	7.03	8.21

O.P.JINDAL SUPER THERMAL POWER PLANT,TAMNAR

Annexure-11

INVESTMENT ON ENVIRONMENT PROTECTION MEASURES

S.No.	Year	Expenditure in Rs
1	2018-19	428831555
2	2019-20	779527156
3	2020-21	513671926
4	2021-22	700425778
5	2022-23	696701391

Note:- Expenditure incurred in pollution control equipments, monitoring, Environmental studies & audits and procurement of monitoring equipments,etc are common for 4X250 MW TPP, 4X600 MW TPP and Coal Washery.

Annexure -12

FINAL REPORT OF THE CONSULTANCY PROJECT

on

Study of the Effect of Fly Ash Dumping on Ground Water Surrounding the Gare IV/2 & 3 Coal Mines

Consultants

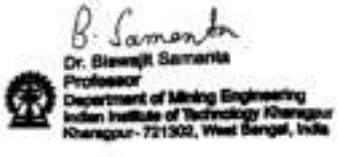
Dr. D Chakravarty, Department of Mining Engineering

Dr. B Samanta , Department of Mining Engineering

Submitted to

Jindal Power Limited, Tamnar

INDIAN INSTITUTE OF TECHNOLOGY
KHARAGPUR 721302
January 2022



PURPOSE OF THE REPORT

This report provides the combined of background of the study, objectives and scope of work. A brief description of the studied environmental parameter is also provided in this report. The geo-environmental parameters of ground water are highlighted. The methodology and sampling procedure for ground water is also provided. The outcome of the study in the form of ground water qualities are reported and the measured values are compared with the regulatory standards. Finally, recommendations of the study have been discussed in this study report.

1. OBJECTIVE OF THE STUDY

Conducting a scientific investigation to assess possible environmental impacts of fly-ash dumping at Gare IV/ 2 &3 mines. The study specifically aims at the following:

- Laboratory analysis of underground water samples collected from the surrounding area of Gare IV/ 2 &3 mines.

2. SCOPE OF WORK

As per the service order issued to IIT Kharagpur in regards with geo-environmental studies, following are the scope of work of the Geo-environmental study of environmental parameters in and around of Gare IV/ 2 &3 mines.

- Ten groundwater samples will be collected around the ash-dumping areas and the following water quality parameters (which form some of the indicated parameters in the regulatory norms of Government of India) will be analyzed for each of the samples. Parameters like pH, Turbidity, Odour, Total Dissolved Solids, Total Hardness (as $CaCO_3$), Alkalinity, Sulphate (SO_4), Chlorides (Cl), Iron(Fe), Manganese (Mn), Copper (Cu), Zinc (Zn), Nickel (Ni), Lead (Pb), Cadmium (Cd), Arsenic (As), Mercury

3. METHODOLOGY

The study team visited the plant site to look into the pertinent ash dumping activities related to the study. After a thorough study of site maps, design methodology of ash dumping, a detailed discussion was made with the plant management to chalk out the program for conducting geo-environmental study. At first, it was decided to select the appropriate sites for collection of ground-water samples. Finally, it was decided to collect ground water samples from borewell at Jharna, Libra, Kosampali & Dongamahua vilages, pieozometer at CHP, Shavitri Nagar Colony and inside plant near WTP, openwell at Jharna village. The details of these have been presented below.

4 WATER SAMPLE PARAMETERS

The major contaminants which are responsible for causing water pollution and for which the quality of water is adjudged, as a standard practice, have been provided in Table 1. These water quality parameters include heavy metals contaminants along with pH, TDS, TSS, alkanity. The adverse impacts of these parameters are also provided in the same table. For groundwater, as it is directly used for drinking purpose, the standard (ANNEXURE 1, BIS 10500) as specific to drinking water quality has been used. It can be noted that permissible level of drinking water contamination is more stringent than affluent discharge, since the affluent mixed with other water bodies gets diluted.

Table 1: Water Quality parameter and their adverse impacts

Water Quality Parameter	Adverse consequences
pH	Water with high pH causes corrosion to pipelines and fittings, can lead to health effects if acid water causes leaching of lead and copper
Turbidity	Turbid water may contain microorganisms that cause diseases
Odour	Generally harmless, causes aesthetic effect only
Total Dissolved Solids	Concentration of TDS is an important indicator for usefulness of water. The higher TDS cannot be used for drinking purpose (recommended concentration upto 500 mg/L. Crops yield is substantially reduced in presence of excess concentration of TDS
Total Hardness (as $CaCO_3$ equivalent) (Chemical Analysis)	Consumes more soap while washing, create scaling in pipeline and boiler, causes aesthetic effect in water, excessive consumption could lead to kidney/ bladder stones
TSS	TSS can include a wide variety of material such as silt, decaying plants, animal matter, industrial waste and sewage. High concentration of TSS can cause many problems for stream health and aquatic lives.
BOD	BOD is an important indicator of the organic matter presence in water. Excessive BOD causes reduced amount of dissolved oxygen content in water, which in turn creates problem of aquatic lives.
COD	The effect of COD is same as BOD.
Oil & Grease	Oil and grease may be toxic. The toxicity varies depending on the types of oil and greases. Various hydrocarbons can pose a wide range of health problems, affecting liver, kidney and blood to increasing risk of cancer. Low level of oil pollution can reduce aquatic organisms ability to reproduce and survive.
Alkalinity	Alkalinity measures the acid neutralization potentiality, less alkaline solution has reduced neutralization potentiality to acidity
Sulphate (SO_4)	Drinking water containing excess sulphate concentration causes laxative effect
Chlorides (Cl)	Causes bad taste of water, excessive chloride concentration causes irrigation problem
Iron (Fe)	Elevated Iron levels in water can cause stain in plumbing, laundry and cooking utensils; and can impart objectionable tastes and colours to foods.
Calcium (Ca)	Calcium contributes to the total hardness of water.
Copper (Cu)	Excess amount of copper causes genetic disorder causing neurological, psychiatric, and liver diseases.
Zinc (Zn)	Some fish can accumulate zinc in their bodies. When zinc enters the bodies of these fish, it is able to bio-magnify up the food chain. Zinc also

	be a threat to cattle and plant species when present in excess quantity
Cobalt (Co)	Cobalt dust is flammable and is toxic by inhalation.
Nickel (Ni)	No perceived problems under controlled limits.
Chromium (Cr)	Hexavalent chromium is carcinogenic by inhalation, and are corrosive to tissue.
Manganese (Mn)	Elevated Manganese can cause stain in plumbing / laundry, and cooking utensils.

5. TESTING PROCEDURE

5.1 LABORATORY TESTING

Water samples collected from the field are tested in the laboratory for determining concentration levels of different pollutants. Testing methods vary depending upon the attribute to be measured. The metal concentration present in water has been tested using atomic absorption spectrophotometer. For testing other pollutant concentrations different methods have been used following standard procedure (APHA, 2005). Methods for testing different attributes are presented in Table 2. The different testing procedures by chemical analysis can be found in a number of text books (Masters, 2005). The testing of heavy metals by AAS procedure is briefly presented in next section for convenience of understanding the working principle of this method.

Table 2: Measuring methods for different water pollutants

Sl. No	Parameters	Measurement Method
1	pH	pH meter
2	Turbidity	Turbidity Meter
3	Odour	Physical
4	TSS	Filtration
5	COD	Chemical Analysis
6	BOD (5 days)	BOD Incubator
7	Oil and grease	Chemical Analysis
8	Total Dissolved Solids	Filtration
9	Total Hardness (as $CaCO_3$ equivalent) (Chemical Analysis)	Chemical Analysis
10	Alkalinity	Chemical Analysis
11	Sulphate (as SO_4)	Chemical Analysis
12	Chlorides (as Cl)	Chemical Analysis
13	Copper (as Cu)	AAS
14	Zinc (as Zn)	AAS
15	Lead (as Pb)	AAS
16	Cobalt (as Co)	AAS
17	Iron (as Fe)	AAS
18	Cadmium (as Cd)	AAS
19	Arsenic(as As)	AAS
20	Manganese (Mn)	AAS
21	Chromium (Cr)	AAS
22	Nickel (Ni)	AAS

5.2 TESTING USING AAS

Atomic absorption spectrometry is an analytical method for determination of metallic elements when present in both trace and major concentrations. This study used AAS for determining the heavy metal concentration in water samples as well as fly-ash samples. Figure 3 presents the photograph of an AAS instrument. As with other analytical techniques AAS requires calibration before testing can proceed. The calibration can be done through several steps including interferences check samples, calibration verification, calibration standard, bland control, and linear dynamic range. The idealised calibration curve is stated by Beer's law that the absorbance of an absorbing analyte is proportional to its concentration.

However, due to several reasons, such as unabsorbed radiation, stary light or disproportionate decomposition of molecules at high concentrations, deviation from linearity is usually observed. Figures 1 and 2 present the AAS instrument and a typical idealized and deviation curves of response respectively . It is desirable to work in the linearity response range. The rule of thumb is that a minimum of five standards and a blank should be prepared in order to have sufficient information to fit the standard curve appropriately. If the sample concentration is too high to permit accurate analysis in linearity response range, there are three alternatives that may help bring the absorbance into the optimum working range: (i) sample dilution, (ii) using an alternative wavelength having a lower absorptivity, (iii) reducing the path length by rotating the burner hand. The details operating principles can be found in (Haswell, S.J., 1991. and Reynolds, R.J. et al., 1970).

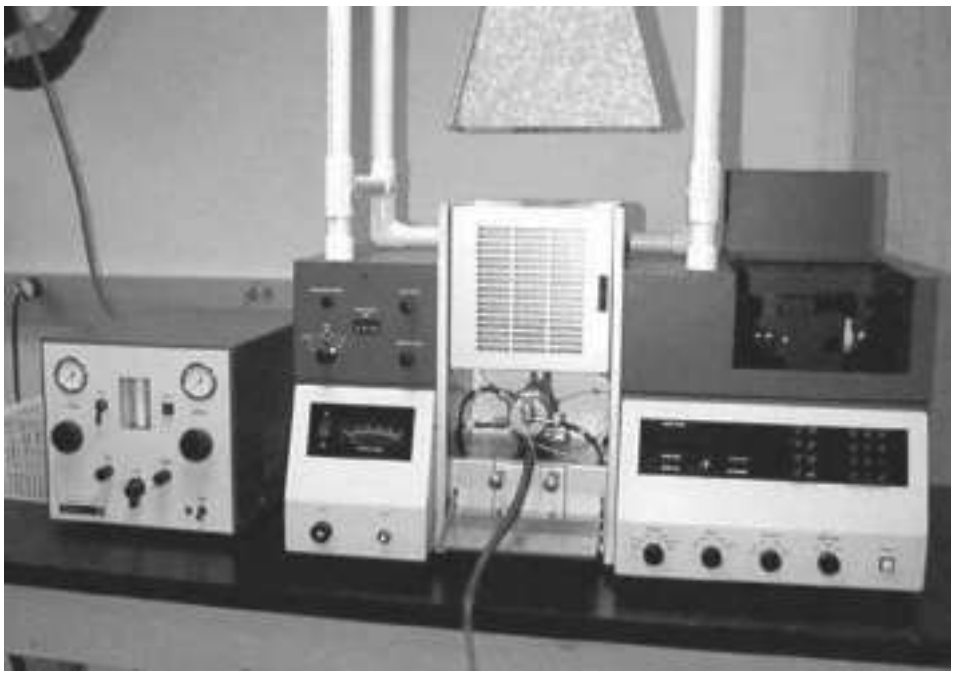


Figure 1: The photograph of the AAS instrument

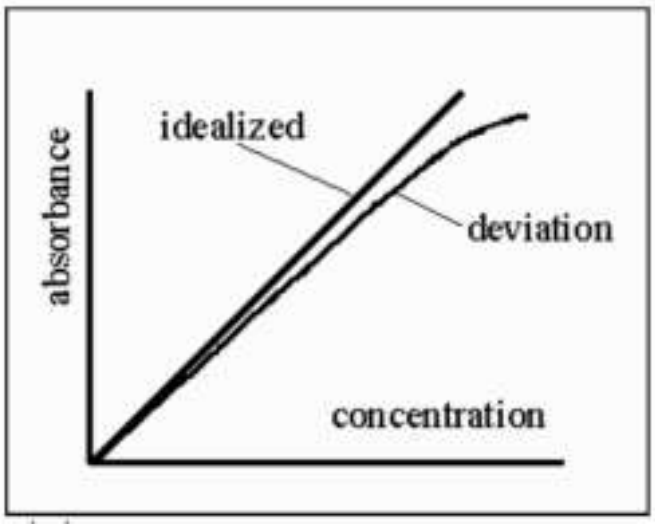


Figure 2: An idealized / deviation response curve

The water samples collected from the site have been analyzed for determination of heavy-metal concentrations. Initially, the calibration curves for each of the elements are prepared using standards. For few of the elements, when the concentration values have not matched in the linear response range, the samples have been diluted appropriately to get the precise measurements. For this purpose, different dilutions in range of 1:10, 1:50, and 1:100 have been tried. It is also important to note that while conducting heavy metal concentration testing using AAS five observations are taken to minimize the experimental error pertaining to AAS method. The results of heavy metal concentrations, hence, reflect the average of these five observations. However, no effort has been put for repeatability of the experiments which are done through chemical analysis in order to minimize the experimental efforts.

6. RESULT

The analysis results for the collected samples are provides in the Tables

ANALYSIS RESULTS

Table 3

Sample Location : PIEZOMETER, CHP OFFICE

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : 10.09.2021

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.50	6.5 – 8.5
2	Turbidity	NTU	4.2	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	430	2000
5	Total Hardness (as $CaCO_3$)	mg/l	230	600
6	Alkalinity	mg/l	225	600
7	Sulphate (SO_4)	mg/l	65.2	400
8	Chlorides (Cl)	mg/l	47.5	1000
9	Iron (Fe)	mg/l	0.10	0.3
10	Manganese (Mn)	mg/l	0.15	0.3
11	Copper (Cu)	mg/l	0.20	1.5
12	Zinc (Zn)	mg/l	1.5	15
13	Nickel (Ni)	mg/l	0.01	0.02
14	Lead (Pb)	mg/l	0.001	0.01
15	Cadmium (Cd)	mg/l	ND	0.003

16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 4

Sample Location : JHARNA VILLAGE OPEN WELL

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : 10.09.2021

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.4	6.5 – 8.5
2	Turbidity	NTU	3.5	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	750	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	440	600
6	Alkalinity	mg/l	200	600
7	Sulphate (SO_4)	mg/l	70.0	400
8	Chlorides (Cl)	mg/l	41.0	1000
9	Iron (Fe)	mg/l	0.20	0.3
10	Manganese (Mn)	mg/l	0.05	0.3
11	Copper (Cu)	mg/l	ND	1.5
12	Zinc (Zn)	mg/l	0.020	15
13	Nickel (Ni)	mg/l	0.006	0.02
14	Lead (Pb)	mg/l	0.002	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 5

Sample Location : **LIBRA VILLAGE**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.09.2021**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.1	6.5 – 8.5
2	Turbidity	NTU	3.80	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	402	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	160	600
6	Alkalinity	mg/l	122	600
7	Sulphate (SO_4)	mg/l	12.0	400
8	Chlorides (Cl)	mg/l	27.0	1000
9	Iron (Fe)	mg/l	0.10	0.3
10	Manganese (Mn)	mg/l	0.021	0.3
11	Copper (Cu)	mg/l	0.201	1.5
12	Zinc (Zn)	mg/l	0.050	15
13	Nickel (Ni)	mg/l	0.010	0.02
14	Lead (Pb)	mg/l	0.004	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 6

Sample Location : **KOSAMPALI VILLAGE**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.09.2021**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.3	6.5 – 8.5
2	Turbidity	NTU	4.0	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	450	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	310	600
6	Alkalinity	mg/l	90	600
7	Sulphate (SO_4)	mg/l	50	400
8	Chlorides (Cl)	mg/l	10.0	1000
9	Iron (Fe)	mg/l	0.15	0.3
10	Manganese (Mn)	mg/l	0.010	0.3
11	Copper (Cu)	mg/l	0.12	1.5
12	Zinc (Zn)	mg/l	0.10	15
13	Nickel (Ni)	mg/l	0.010	0.02
14	Lead (Pb)	mg/l	0.002	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 7

Sample Location : **DONGAMAHUA VILLAGE**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.09.2021**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.3	6.5 – 8.5
2	Turbidity	NTU	4.0	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	580	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	310	600
6	Alkalinity	mg/l	130	600
7	Sulphate (SO_4)	mg/l	41.8	400
8	Chlorides (Cl)	mg/l	70.5	1000
9	Iron (Fe)	mg/l	0.06	0.3
10	Manganese (Mn)	mg/l	0.006	0.3
11	Copper (Cu)	mg/l	0.06	1.5
12	Zinc (Zn)	mg/l	0.012	15
13	Nickel (Ni)	mg/l	0.004	0.02
14	Lead (Pb)	mg/l	0.001	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 8

Sample Location : **PIEZOMETER INSIDE PLANT WTP**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.09.2021**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.40	6.5 – 8.5
2	Turbidity	NTU	3.1	5
3	Odour	-	UO	Agreeable
4	Total Dissolved Solids	mg/l	550	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	340	600
6	Alkalinity	mg/l	290	600
7	Sulphate (SO_4)	mg/l	60	400
8	Chlorides (Cl)	mg/l	55	1000
9	Iron (Fe)	mg/l	0.03	0.3
10	Manganese (Mn)	mg/l	0.007	0.3
11	Copper (Cu)	mg/l	0.02	1.5
12	Zinc (Zn)	mg/l	0.010	15
13	Nickel (Ni)	mg/l	0.011	0.02
14	Lead (Pb)	mg/l	0.003	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 9

Sample Location : **PIEZOMETER INSIDE SAVITRINAGAR COLONY**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.09.2021**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.30	6.5 – 8.5
2	Turbidity	NTU	3.80	5
3	Odour	-	UO	Agreeable
4	Total Dissolved Solids	mg/l	610	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	440	600
6	Alkalinity	mg/l	310	600
7	Sulphate (SO_4)	mg/l	70	400
8	Chlorides (Cl)	mg/l	90	1000
9	Iron (Fe)	mg/l	0.02	0.3
10	Manganese (Mn)	mg/l	0.014	0.3
11	Copper (Cu)	mg/l	0.020	1.5
12	Zinc (Zn)	mg/l	0.040	15
13	Nickel (Ni)	mg/l	0.014	0.02
14	Lead (Pb)	mg/l	0.002	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 10

Sample Location : **SHAKTI VEHAR – II PIEZOMETER**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.09.2021**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.50	6.5 – 8.5
2	Turbidity	NTU	4.8	5
3	Odour	-	UO	Agreeable
4	Total Dissolved Solids	mg/l	590	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	430	600
6	Alkalinity	mg/l	25	600
7	Sulphate (SO_4)	mg/l	60	400
8	Chlorides (Cl)	mg/l	70	1000
9	Iron (Fe)	mg/l	0.02	0.3
10	Manganese (Mn)	mg/l	0.018	0.3
11	Copper (Cu)	mg/l	0.016	1.5
12	Zinc (Zn)	mg/l	0.06	15
13	Nickel (Ni)	mg/l	0.008	0.02
14	Lead (Pb)	mg/l	0.002	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 11

Sample Location : **JPL II GATE– III PIEZOMETER**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.09.2021**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.10	6.5 – 8.5
2	Turbidity	NTU	2.80	5
3	Odour	-	UO	Agreeable
4	Total Dissolved Solids	mg/l	540	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	420	600
6	Alkalinity	mg/l	390	600
7	Sulphate (SO_4)	mg/l	80	400
8	Chlorides (Cl)	mg/l	80	1000
9	Iron (Fe)	mg/l	0.020	0.3
10	Manganese (Mn)	mg/l	0.004	0.3
11	Copper (Cu)	mg/l	0.09	1.5
12	Zinc (Zn)	mg/l	0.09	15
13	Nickel (Ni)	mg/l	0.002	0.02
14	Lead (Pb)	mg/l	0.005	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

*Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 12

Sample Particulars : ASSESSMENT OF SURFACE WATER QUALITY PARAMETERS

Date of Sampling : **10.09.2021**

S. No	Parameters	Unit	Bendra Nallah Upstream	Bendra Nallah Down stream	Kelo River Upstream	Kelo River Downstream	Effluent discharge limit for inland surface water as per G.S.R.422
1	pH	pH Unit	7.4	7.6	7.6	7.7	5.5-9.0
2	TSS	mg/l	38	42	45	43	100
3	COD	mg/l	68	69	56	60	250
4	BOD (5 days)	mg/l	13.5	14.0	15.0	14.5	30
5	Oil and grease	mg/l	0.6	0.7	0.3	0.4	10
6	Copper (Cu)	mg/l	0.006	0.004	0.008	0.006	3.0
7	Zinc (Zn)	mg/l	0.056	0.004	0.008	0.011	5.0
8	Lead (Pb)	mg/l	0.004	0.006	0.034	0.043	0.1
9	Iron (Fe)	mg/l	0.018	0.025	0.021	0.019	3.0
10	Cadmium (Cd)	mg/l	0.0031	0.003	0.005	0.006	2.0
11	Arsenic (As)	mg/l	ND	ND	ND	ND	0.2
12	Manganese (Mn)	mg/l	0.06	0.007	0.005	0.006	2.0
13	Mercury	mg/l	ND	ND	ND	ND	0.01
14	Nickel (Ni)	mg/l	0.11	0.03	0.025	0.08	3.0

*Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table: 13

Sample Particulars : ANALYSIS RESULTS OF SOIL SAMPLES

Date of Sampling : 10.09.2021

S. No	Parameters	Unit	Kosumpalli Village	Libra Village	Dongamahua Village	Mining OB
1.	pH	-	7.10	7.70	7.30	7.30
2.	Zinc (Zn)	ppm	2.60	2.42	2.50	2.70
3.	Copper (Cu)	ppm	1.70	1.68	1.47	1.70
4.	Lead (Pb)	ppm	0.40	0.55	0.34	0.58
5.	Cadmium (Cd)	ppm	0.15	0.13	0.12	0.20
6.	Selenium (Se)	ppm	0.022	0.016	0.018	0.014
7.	Nickel (Ni)	ppm	0.23	0.25	0.46	0.38
8.	Chromium (Cr)	ppm	0.35	1.01	1.30	1.43
9.	Arsenic (As)	ppm	0.03	0.06	0.03	0.05
10.	Mercury (Hg)	ppm	0.003	0.005	0.007	0.008

*Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicate

Table: 14

Sample Particulars : ANALYSIS RESULTS OF FLY ASH SAMPLES

Date of Sampling : 10.09.2021

Sl. No.	Parameters	Unit	Mine Dump	4 x 600 MW	4 x 250 MW
1.	Silica (SiO_2)	% by mass	62.4	60.8	61.4
2.	Chloride (Cl)	% by mass	4.20	4.80	4.60
3.	Zinc (Zn)	ppm	59.5	54.9	53.8
4.	Copper (Cu)	ppm	66.4	68.8	65.0
5.	Manganese (Mn)	ppm	172.0	174.2	174.0
6.	Cobalt (Co)	ppm	43.0	41.1	47.8
7.	Lead (Pb)	ppm	8.6	9.2	9.5
8.	Cadmium (Cd)	ppm	0.03	0.01	0.04
9.	Selenium (Se)	ppm	0.01	0.01	0.01
10.	Nickel (Ni)	ppm	36.8	33.3	31.2
11.	Arsenic (As)	ppm	0.01	0.03	0.04
12.	Mercury (Hg)	ppm	0.03	0.02	0.03
13.	Chromium (Cr)	ppm	0.21	0.22	0.24

*Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table: 15

Sample Particulars : ANALYSIS RESULTS OF AAQM PARAMETER

Sample Particulars: Ambient Air Quality Monitoring
Parameter Date of Sampling: 10.09.2021 & **11.09.2021**

Sl. No.	Parameters	Unit	Near CHP office	Near CHP office Canteen	Near Kosampalli Gate	Near Mine switch yard
1.	PM 10	$\mu g/m^3$	70.2	73.5	71.2	80.0
2.	PM 2.5	$\mu g/m^3$	32.4	38.0	37.4	42.1
3.	SO_2	$\mu g/m^3$	15.9	16.0	15.6	15.7
4.	NOx	$\mu g/m^3$	23.1	23.0	24.5	24.8
5.	CO	mg/m^3	0.43	0.41	0.45	0.45

- First two samples are collected on 10th and last two samples collected on 11st September 2021.

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ANALYSIS RESULTS for Second Six Months

Table 16

Sample Location : **PIEZOMETER, CHP OFFICE**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.03.2022**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.30	6.5 – 8.5
2	Turbidity	NTU	4.5	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	540	2000
5	Total Hardness (as $CaCO_3$)	mg/l	350	600
6	Alkalinity	mg/l	210	600
7	Sulphate (SO_4)	mg/l	70.0	400
8	Chlorides (Cl)	mg/l	48.2	1000
9	Iron (Fe)	mg/l	0.06	0.3
10	Manganese (Mn)	mg/l	0.07	0.3
11	Copper (Cu)	mg/l	0.11	1.5
12	Zinc (Zn)	mg/l	1.05	15
13	Nickel (Ni)	mg/l	0.02	0.02
14	Lead (Pb)	mg/l	0.001	0.01
15	Cadmium (Cd)	mg/l	0.003	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 17

Sample Location : **JHARNA VILLAGE OPEN WELL**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.03.2022**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.3	6.5 – 8.5
2	Turbidity	NTU	3.8	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	750	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	440	600
6	Alkalinity	mg/l	190	600
7	Sulphate (SO_4)	mg/l	85.0	400
8	Chlorides (Cl)	mg/l	45.0	1000
9	Iron (Fe)	mg/l	0.12	0.3
10	Manganese (Mn)	mg/l	0.11	0.3
11	Copper (Cu)	mg/l	0.003	1.5
12	Zinc (Zn)	mg/l	0.09	15
13	Nickel (Ni)	mg/l	0.03	0.02
14	Lead (Pb)	mg/l	0.001	0.01
15	Cadmium (Cd)	mg/l	0.003	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 18

Sample Location : **LIBRA VILLAGE**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.03.2022**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.4	6.5 – 8.5
2	Turbidity	NTU	4.20	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	390	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	165	600
6	Alkalinity	mg/l	120	600
7	Sulphate (SO_4)	mg/l	13.0	400
8	Chlorides (Cl)	mg/l	35.0	1000
9	Iron (Fe)	mg/l	0.12	0.3
10	Manganese (Mn)	mg/l	0.079	0.3
11	Copper (Cu)	mg/l	0.08	1.5
12	Zinc (Zn)	mg/l	0.02	15
13	Nickel (Ni)	mg/l	0.03	0.02
14	Lead (Pb)	mg/l	0.002	0.01
15	Cadmium (Cd)	mg/l	0.003	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 19

Sample Location : **KOSAMPALI VILLAGE**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.03.2022**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.3	6.5 – 8.5
2	Turbidity	NTU	4.2	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	467	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	310	600
6	Alkalinity	mg/l	90	600
7	Sulphate (SO_4)	mg/l	48	400
8	Chlorides (Cl)	mg/l	14.0	1000
9	Iron (Fe)	mg/l	0.11	0.3
10	Manganese (Mn)	mg/l	0.034	0.3
11	Copper (Cu)	mg/l	0.011	1.5
12	Zinc (Zn)	mg/l	0.07	15
13	Nickel (Ni)	mg/l	0.017	0.02
14	Lead (Pb)	mg/l	0.003	0.01
15	Cadmium (Cd)	mg/l	0.003	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 20

Sample Location : DONGAMAHUA VILLAGE

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : 10.03.2022

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.2	6.5 – 8.5
2	Turbidity	NTU	4.6	5
3	Odour	-	Agreeable	Agreeable
4	Total Dissolved Solids	mg/l	580	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	310	600
6	Alkalinity	mg/l	150	600
7	Sulphate (SO_4)	mg/l	41.0	400
8	Chlorides (Cl)	mg/l	72.0	1000
9	Iron (Fe)	mg/l	0.02	0.3
10	Manganese (Mn)	mg/l	0.006	0.3
11	Copper (Cu)	mg/l	0.005	1.5
12	Zinc (Zn)	mg/l	0.02	15
13	Nickel (Ni)	mg/l	0.015	0.02
14	Lead (Pb)	mg/l	0.001	0.01
15	Cadmium (Cd)	mg/l	0.003	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 21

Sample Location : **PIEZOMETER INSIDE PLANT WTP**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.03.2022**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.30	6.5 – 8.5
2	Turbidity	NTU	4.0	5
3	Odour	-	UO	Agreeable
4	Total Dissolved Solids	mg/l	570	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	360	600
6	Alkalinity	mg/l	310	600
7	Sulphate (SO_4)	mg/l	50	400
8	Chlorides (Cl)	mg/l	51	1000
9	Iron (Fe)	mg/l	0.012	0.3
10	Manganese (Mn)	mg/l	0.011	0.3
11	Copper (Cu)	mg/l	0.01	1.5
12	Zinc (Zn)	mg/l	0.029	15
13	Nickel (Ni)	mg/l	0.018	0.02
14	Lead (Pb)	mg/l	0.001	0.01
15	Cadmium (Cd)	mg/l	0.003	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 22

Sample Location : **PIEZOMETER INSIDE SAVITRINAGAR COLONY**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.03.2022**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.20	6.5 – 8.5
2	Turbidity	NTU	3.9	5
3	Odour	-	UO	Agreeable
4	Total Dissolved Solids	mg/l	640	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	440	600
6	Alkalinity	mg/l	310	600
7	Sulphate (SO_4)	mg/l	70	400
8	Chlorides (Cl)	mg/l	85	1000
9	Iron (Fe)	mg/l	0.028	0.3
10	Manganese (Mn)	mg/l	0.012	0.3
11	Copper (Cu)	mg/l	0.011	1.5
12	Zinc (Zn)	mg/l	0.031	15
13	Nickel (Ni)	mg/l	0.018	0.02
14	Lead (Pb)	mg/l	0.001	0.01
15	Cadmium (Cd)	mg/l	0.003	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 23

Sample Location : **SHAKTI VEHAR – II PIEZOMETER**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.03.2022**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.10	6.5 – 8.5
2	Turbidity	NTU	1.2	5
3	Odour	-	UO	Agreeable
4	Total Dissolved Solids	mg/l	490	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	210	600
6	Alkalinity	mg/l	35	600
7	Sulphate (SO_4)	mg/l	60	400
8	Chlorides (Cl)	mg/l	62	1000
9	Iron (Fe)	mg/l	0.04	0.3
10	Manganese (Mn)	mg/l	0.201	0.3
11	Copper (Cu)	mg/l	0.011	1.5
12	Zinc (Zn)	mg/l	0.012	15
13	Nickel (Ni)	mg/l	0.009	0.02
14	Lead (Pb)	mg/l	0.002	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

* Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 24

Sample Location : **JPL II GATE– III PIEZOMETER**

Sample Particulars : ASSESSMENT OF GROUND WATER QUALITY PARAMETERS

Date of Sampling : **10.03.2022**

Sl. No	Parameters	Unit	Result	Permissible limit for drinking as per IS: 10500
1	pH	pH Unit	7.10	6.5 – 8.5
2	Turbidity	NTU	1.50	5
3	Odour	-	UO	Agreeable
4	Total Dissolved Solids	mg/l	400	2000
5	Total Hardness (as $CaCO_3$ equiv.)	mg/l	410	600
6	Alkalinity	mg/l	320	600
7	Sulphate (SO_4)	mg/l	80	400
8	Chlorides (Cl)	mg/l	76	1000
9	Iron (Fe)	mg/l	0.014	0.3
10	Manganese (Mn)	mg/l	0.012	0.3
11	Copper (Cu)	mg/l	0.08	1.5
12	Zinc (Zn)	mg/l	0.036	15
13	Nickel (Ni)	mg/l	0.011	0.02
14	Lead (Pb)	mg/l	0.004	0.01
15	Cadmium (Cd)	mg/l	ND	0.003
16	Arsenic (As)	mg/l	ND	0.05
17	Mercury	mg/l	ND	0.001

*Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table 25

Sample Particulars : ASSESSMENT OF SURFACE WATER QUALITY PARAMETERS

Date of Sampling : 10.03.2022

S. No	Parameters	Unit	Bendra Nallah Upstream	Bendra Nallah Down stream	Mine Sump	Kelo River Upstream	Kelo River Downstream	Effluent discharge limit for inland surface water as per G.S.R.422
1	pH	pH Unit	7.4	7.6	7.1	7.5	7.6	**5.5-9.0**
2	TSS	mg/l	42	45	60	47	45	**100**
3	COD	mg/l	70	65	67	60	58	**250**
4	BOD (5 days)	mg/l	12.2	13.1	13.5	12.5	13.5	**30**
5	Oil and grease	mg/l	0.6	0.5	0.7	0.5	0.4	**10**
6	Copper (Cu)	mg/l	0.006	0.004	0.12	0.007	0.008	**3.0**
7	Zinc (Zn)	mg/l	0.04	0.02	0.03	0.04	0.03	**5.0**
8	Lead (Pb)	mg/l	0.004	0.006	0.007	0.09	0.03	**0.1**
9	Iron (Fe)	mg/l	0.700	0.65	0.12	1.30	1.90	**3.0**
10	Cadmium (Cd)	mg/l	0.003	0.006	0.010	0.003	0.005	**2.0**
11	Arsenic (As)	mg/l	0.03	0.011	0.012	0.011	0.018	**0.2**
12	Manganese (Mn)	mg/l	0.05	0.019	0.54	0.023	0.019	**2.0**
13	Mercury	mg/l	ND	ND	0.003	ND	ND	**0.01**
14	Nickel (Ni)	mg/l	0.145	0.032	0.03	0.050	0.020	**3.0**

*Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table: 26

Sample Particulars : ANALYSIS RESULTS OF SOIL SAMPLES

Date of Sampling : 10.03.2022

S. No	Parameters	Unit	Kosumpalli Village	Libra Village	Dongamahua Village	Mining OB
1.	pH	-	7.20	7.50	7.40	7.50
2.	Zinc (Zn)	ppm	2.80	2.32	2.40	3.70
3.	Copper (Cu)	ppm	1.90	1.80	1.60	1.80
4.	Lead (Pb)	ppm	0.30	0.50	0.39	0.68
5.	Cadmium (Cd)	ppm	0.16	0.14	0.18	0.21
6.	Selenium (Se)	ppm	0.025	0.019	0.016	0.013
7.	Nickel (Ni)	ppm	0.20	0.24	0.48	0.39
8.	Chromium (Cr)	ppm	0.50	1.20	1.10	1.30
9.	Arsenic (As)	ppm	0.04	0.05	0.04	0.06
10.	Mercury (Hg)	ppm	0.004	0.004	0.006	0.007

*Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicate

Table: 27

Sample Particulars : ANALYSIS RESULTS OF FLY ASH SAMPLES

Date of Sampling : 10.03.2022

Sl. No.	Parameters	Unit	Mine Dump	4 x 600 MW	4 x 250 MW
1.	Silica (SiO_2)	% by mass	62.4	64.8	63.8
2.	Chloride (Cl)	% by mass	5.60	5.80	5.60
3.	Zinc (Zn)	ppm	60.5	62.8	60.7
4.	Copper (Cu)	ppm	63.4	69.8	68.0
5.	Manganese (Mn)	ppm	180.0	170.2	178.0
6.	Cobalt (Co)	ppm	47.0	45.2	49.7
7.	Lead (Pb)	ppm	7.9	9.5	10.0
8.	Cadmium (Cd)	ppm	0.02	0.03	0.02
9.	Selenium (Se)	ppm	0.01	0.01	0.01
10.	Nickel (Ni)	ppm	38.8	35.3	36.2
11.	Arsenic (As)	ppm	0.01	0.03	0.02
12.	Mercury (Hg)	ppm	0.02	0.02	0.01
13.	Chromium (Cr)	ppm	0.26	0.28	0.27

*Heavy Metal concentration has been determined by Atomic Absorption Spectrometry (AAS) using 5 numbers of replicates of the samples and the value reported above is the average of 5 such replicates.

Table: 28

Sample Particulars : ANALYSIS RESULTS OF AAQM PARAMETER

Sample Particulars: Ambient Air Quality Monitoring
Parameter Date of Sampling: 09.03.2022 & 10.03.2022

Sl. No.	Parameters	Unit	Near CHP office	Near CHP office Canteen	Near Kosampalli Gate	Near Mine switch yard
1.	PM 10	$\mu g/m^3$	75.2	78.0	76.3	76.5
2.	PM 2.5	$\mu g/m^3$	32.1	35.4	34.4	42.2
3.	SO_2	$\mu g/m^3$	15.6	16.7	14.2	17.8
4.	NOx	$\mu g/m^3$	24.0	23.0	21.5	22.8
5.	CO	mg/m^3	0.45	0.40	0.46	0.42

- First two samples are collected on 09th and last two samples collected on 10th March 2022.

7.0 **GEO-ENVIRONMENTAL IMPACT ON FLORA & FAUNA**

A global perspective of mining activities suggests that mining of coal and minerals and other fossil fuels can cause air, water, noise, and soil pollutions which can in turn adversely affect ecosystems of surrounding area including lives of the flora and fauna, and other aquatic lives prevailing thereof. The adverse impacts of mining on flora and fauna are case specific and very challenging to assess.

The possible harmful effect of fly-ash dumpling would be, potentiality the formation of air borne particulate matters. The air-borne respiratory particles may pose threat to workers health. The heavy metal may be migrated to water due to fly-ash leaching from dumping areas. These may potentiality cause adverse effect on flora and fauna. In this case specific mine, the analysis of air samples, water samples, and fly-ash samples indicate that environment pollution is not in an alarming degree to pose substantial threat on flora and fauna, based on the following observations.

a) The average ambient air quality parameter values, i.e., SO2, NOx, CO, observed in the mining are, are below the critical values of NAAQS. Even though, fly-ash dust gets air-borne, during the observation period the concentrations of PM2.5 and PM-10 are observed to be below the permissible limits.

b) The concentrations of different pollutants as observed in the surface water and ground water samples did not exceed the maximum permissible limits and most of the cases fall below the specified limits with respect to heavy metal concentrations as well as other water quality attributes / pollutants.

Therefore, the fly-ash mixed dumping may not be a serious concern from environmental point of view and may not cause significant impact on the flora, fauna and other aquatic lives in and around the mining area studied. However, period monitoring is required on these parameters from time to time.

8. CONCLUSIONS AND RECOMMENDATION

The test report of the groundwater, surface water, soil, fly-ash and air samples reflect that the environmental parameters are within the threshold limits of safe working as per the regulatory guidelines. There is no trend of either increasing or decreasing nature of the environmental parameters as observed based on these studies, although there are certain fluctuations of these parameters. Therefore, adverse impact of fly-ash mixed dumping is not quite apparent from these studies.

However, the periodic study should be continued for proper monitoring of the environmental parameters.

9. Acknowledgements

The study team is grateful to the sponsoring authorities for funding the present study. The study team also acknowledges the authorities of IIT Kharagpur for allowing the investigators to carry out the present study. They also wish to thank all the officials involved from JPL for all their help during the study.

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ANNEXURE - A1 DRINKING WATER SPECIFICATION: IS: 10500

TOLERANCE LIMITS

S.No	Parameter	IS: 10500 Requirem ent (Desirable limit)	Undesirable effect outside the desirable limit	IS: 10500 Permissible limit in the absence of alternate source
Essential Characteristics				
1.	pH	6.5 – 8.5	Beyond this range the water will effect the mucous membrane and / or water supply system	No relaxation
2.	Colour (Hazen Units), Maximum	5	Above 5, consumer acceptance decreases	25
3.	Odour	Unobjectio nable	--	--
4.	Taste	Agreeable	--	--
5.	Turbidity, NTU, Max	5	Above 5, consumer acceptance decreases	10
Following Results are expressed in mg/1 :				
6.	Total hardness as $CaCO_3$, Max	300	Encrustation in water supply structure and adverse effects on domestic use	600
7.	Iron as Fe, Max	0.30	Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures, and promotes iron bacteria.	1.0
8.	Chlorides as Cl, Max	250	Beyond this limit tast, corrosion and palatability are effected	1000
9.	Residual, Free Chlorine, Min	0.20	--	--
Desirable Characteristics				
10.	Dissolved solids, Max	500	Beyond this palatability decreases and may cause gastro intentional irritation	2000
11.	Calcium as Ca,	75	Encrustation in water supply structure and adverse effects	200

	Max		on domestic use	
12.	Magnesium as Mg, Max	30	--	100
13.	Copper as Cu, Max	0.05	Astringent taste, discoloration and corrosion of pipes, fitting and utensils will be caused beyond this	1.5
14.	Manganese as Mn, Max	0.1	Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures	0.3
15.	Sulphate as SO_4 Max	200	Beyond this causes gastro intentional irritation when magnesium or sodium are present	400
16.	Nitrates as NO_3	45	Beyond this methanemoglobinemia takes place	100
17.	Fluoride, Max	1.0	Fluoride may be kept as low as possible. High fluoride may cause fluorosis	1.5
18.	Phenolic compounds as C_6H_5OH, Max	0.001	Beyond this, it may cause objectionable taste and odour	0.002
19.	Mercury as Hg, Max	0.001	Beyond this, the water becomes toxic	No relaxation
20.	Cadmium as Cd, Max	0.01	Beyond this, the water becomes toxic	No relaxation
21.	Selenium as Se, Max	0.01	Beyond this, the water becomes toxic	No relaxation
22.	Arsenic as As, Max	0.05	Beyond this, the water becomes toxic	No relaxation
23.	Cyanide as CN, Max	0.05	Beyond this, the water becomes toxic	No relaxation
24.	Lead as Pb, Max	0.05	Beyond this, the water becomes toxic	No relaxation
25.	Zinc as Zn, Max	5	Beyond this limit it can cause astringent taste and an opalescence in water	15
26.	Anionic detergents as MBAS, Max	0.2	Beyond this limit it can cause a light froth in water	1.0
27.	Chromium as Cr^{6+}, Max	0.05	May be carcinogenic above this limit	No relaxation
28.	Ploynuclear aromatic hydrocarbons as	--	May be carcinogenic	--

	PAH, Max			
29.	Mineral Oil, Max	0.01	Beyond this limit undesirable	
			taste and odour after chlorination take place	0.03
30.	Pesticides, Max	Absent	Toxic	0.001
31.	Radioactive materials a) α emitters Bq/1, Max b) β emitters Pci/1, Max	-- --	-- --	0.1 1
32.	Alkalinity, Max	200	Beyond this limit taste becomes unpleasant	600
33.	Aluminum as Al, Max	0.03	Cumulative effect is reported to cause dementia	0.2
34.	Boron, Max	1	--	5

JINDAL POWER

JPL/EMD/F-12/2023/15

24/04/2023

The Member Secretary,
Central Pollution Control Board,
Parivesh Bhawan, CBD-cum-Office Complex
East Arjun Nagar
Delhi-110 032

Sub:- Annual Implementation Report (Ash Compliance Report) for FY 2022-23 as per Fly Ash Notification, 31st December 2021.

Dear Sir,

Please find enclosed herewith duly filled format for Annual Implementation Report (ash compliance report) of 4X250 MW TPP of Jindal Power Limited, Tamnar, Raigarh for the financial year 2022-23 as per Fly Ash Notification, 31st December 2021.

This is for your information and record please.

Thanking You.

Yours faithfully
For Jindal Power Limited

Gajendra Rawat
Head-O&M

Encl.: As above.

Cc:

Ministry of Environment, Forests & Climate Change Integrated Regional office (IRO), Aranya Bhawan, North Block, Sector-19, Naya Raipur, Atal Nagar, Chhattisgarh-492002	The Zonal Officer Central Pollution Control Board 4th Floor, Sahkar Bhawan North T. T. Nagar, Bhopal-462003
The Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhavan, North Block Sec.19 Atal Nagar, Raipur (CG) -490099	Central Electricity Authority CD Division, CEA, New Delhi.
The Regional Officer, Chhattisgarh Environment Conservation Board, T.V. Tower Road, Raigarh	For your kind information and record.

Jindal Power Limited
CIN No. : UD4010CT1995PLC008985
Corporate Office Jindal Centre, 12 Bhikaiji Cama Place, New Delhi 110 066
T +91 11 4146 2000 F +91 11 2616 1271 E info@jindalpower.com W www.jindalpower.com
Registered Office Tamnar 496 107, District Raigarh, Chhattisgarh

Sl. No.	Details (FY 22-23)	
1	Name of Power Plant	M/s O.P.Jindal Super Thermal Power Plant
2	Name of the company	Jindal Power Limited, Tamnar
3	District	Raigarh
4	State	Chhattisgarh
5	Postal address for communication:	Village & Post- Tamnar, District-Raigarh (C.G) Pin Code-496107
6	E-mail:	jpl.emd@jindalpower.com
7	Power Plant installed capacity (MW):	1000 MW (4x250 MW)
8	Plant Load Factor (PLF): %	68.39
9	No. of units generated (MWh):	5990953
10	Total area under power plant (ha): (including area under ash ponds)	Power Plant-360 Ha (for 4X250 MW & 4X600 MW TPPs)
		Ash pond- 198 Ha
11	Quantity of coal consumption during reporting period (Metric Tons per Annum):	4840660
12	Average ash content in percentage (per cent):	44.69
13	Quantity of current ash generation during reporting period (Metric Tons per Annum):	2163291
	Fly ash (Metric Tons per Annum):	1730633
	Bottom ash (Metric Tons per Annum):	432658
14	Capacity of dry fly ash storage silo(s) (Metric Tons) :	3200 MT(2X1600 MT)
15	Details of utilisation of current ash generated during reporting period	
	(a) Total quantity of current ash utilised (MTPA) during reporting period:	2140174
	(b) Quantity of fly ash utilised (MTPA):	2140174
	(i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels)	1179
	(ii) Cement manufacturing:	0
	(iii) Ready mix concrete:	0
	(iv) Ash and Geo-polymer based construction material:	0
	(v) Manufacturing of sintered or cold bonded ash aggregate:	0
	(vi) Construction of roads, road and fly over embankment:	0
	(vii) Construction of dams:	0
	(viii) Filling up of low lying area:	203144
	(ix) Filling of mine voids:	1935851
	(x) Use in overburden dumps:	0
	(xi) Agriculture:	0
	(xii) Construction of shoreline protection structures in coastal districts;	0
	(xiii) Export of ash to other countries:	0
	(xiv) Others (please specify):	0
	(c) Quantity of bottom ash utilised (MTPA):	0
	(i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	0
	(ii) Cement manufacturing:	0
	(iii) Ready mix concrete:	0
	(iv) Ash and Geo-polymer based construction material:	0
	(v) Manufacturing of sintered or cold bonded ash aggregate:	0
	(vi) Construction of roads, road and flyover embankment:	0
	(vii) Construction of dams:	0
	(viii) Filling up of low lying area:	0
	(ix) Filling of mine voids:	0
	(x) Use in overburden dumps:	0
	(xi) Agriculture:	0
	(xii) Construction of shoreline protection structures in coastal districts:	0
	(xiii) Export of ash to other countries:	0
	(xiv) Others (please specify):	0

	Total quantity of current ash unutilised (MTPA) during reporting period:	23117
16	Percentage utilisation of current ash generated during reporting period (per cent):	98.93
17	Details of disposal of ash in ash ponds	
	(a) Total quantity of ash disposed in ash pond(s) (Metric Tons)as on 31st March (excluding reporting period):	10422980
	(b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons):	23117
	(c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m3):	
	(d) Total number of ash ponds:	1
	(i) Active:	1
	(ii) Exhausted (yet to be reclaimed):	0
	(iii) Reclaimed:	0
	(e) total area under ash ponds (ha):	198
18	Individual ash pond details Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one)	N.A.
	(a) Status: Under construction or Active or Exhausted or Reclaimed	Active
	(b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY):	Dec, 2007
	(c) Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds)	NA
	(c) area (hectares):	198
	(d) dyke height (m):	18 m
	(d) volume (m3):	33145783
	(e) quantity of ash disposed as on 31st March (Metric Tons):	10446097
	(f) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons):	4550337.01 M^3 (13.72%), 4095303.31 MT
	(g) expected life of ash pond (number of years and months):	01 Year and 1.5 months
	(e) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates)	**SN Latitude Longitude** **1 22.12279 83.44879** **2 22.13349 83.45347** **3 22.12592 83.46450** **4 22.11995 83.46389**
	(f) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining	Clay, LDPE and PCC lining
	g) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD)	LCSD
	(h) Ratio of ash: water in slurry mix (1:___):	01:03
	(i) Ash water recycling system (AWRS) installed and functioning: Yes or No	Yes
	(j) Quantity of wastewater from ash pond discharged into land or water body (m3):	No
	(k) Last date when the dyke stability study was conducted and name of the organisation who conducted the study:	28.04.2021, L&T-S&L
	(l) Last date when the audit was conducted and name of the organisation who conducted the audit:	27.4.2022, IIT Kharagpr
	Quantity of legacy ash utilised (MTPA):	Not applicable (Ash pond / dyke of JPL, Tamnar is operational. Hence as
	i. Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	
	ii. Cement manufacturing:	
	iii. Ready mix concrete:	
	iv. Ash and Geo-polymer based construction material:	
	v. Manufacturing of sintered or cold bonded ash aggregate:	
	vi. Construction of roads, road and flyover embankment:	

19	vii. Construction of dams:	per notification amendment has issued by MoEF&CC dated 31.12.2022 ash of ash dyke will not be considered as legacy ash).
	viii. Filling up of low lying area:	
	ix. Filling of mine voids:	
	x. Use in overburden dumps:	
	xi. Agriculture:	
	xii. Construction of shoreline protection structures in coastal districts;	
	xiii. Export of ash to other countries:	
	xiv. Others (please specify):	

20 Summary:

Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)
Current ash during reporting period	2163291	2140174 98.93	23117
Legacy ash	(Ash pond / dyke of JPL, Tamnar is operational. Hence as per notification amendment has issued by MoEF&CC dated 31.12.2022 ash of ash dyke will not be considered as legacy ash).		
Total	2163291	2140174	23117

21	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcccoalash@gov.in	
22	Signature of Authorised Signatory