एनटीपीसी NTPC
एक महारत्न कंपनी

एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)
गाडरवारा/ GADARWARA

Dated: 20/04/2019

NTPC-Gadarwara-HYC-18-19

The Additional Chief Conservator of forest
Ministry of Environment, forest & Climate Change
Regional Office, MoEF (Western Zone),
Kendriya Paryavaran Bhavan,
E-5Arera Colony Link Road No.3,
Ravishankar Nagar, Bhopal (M.P.) - 462 016

Sub: Half yearly Compliance report of NTPC-Gadarwara (2 x 800 MW)
Reference : Environment Clearance J-13012/ 125/ 2009- IA.II (T) dated 22/03/2013

Dear Sir,
Please find enclosed Half Yaerly Compliance (HYC) report of NTPC-Gadarwara (2 x 800 MW) for the period October'2018 to March'2018 19 line with the guidelines as stipulated by MoEF&CC for kind perusal please.

Thanking you,

(D. Shrikhande)
(AGM) Environment Group

GADARWARA SUPER THERMAL POWER PROJECT,
STAGE-I (2X800 MW)

Compliance status of Environmental Clearance Vide Letter No: J-13012/125/2009-IA,II(T) Dt:22/03/13
Period of Compliance Report – (01.10.2018 to 31.03.2019)

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A. Specific Conditions:		
i	The project proponent shall set up the power project as a model plant demonstrating that ecology and development can co-exists in harmony and set examples for others to emulate similar practice.	NTPC Gadarwara is setting up power project as a model plant demonstrating that ecology and development can co-exists in harmony. The details are attached as **Annexure-I**
ii	Sulphur and ash contents in the coal to be use 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 the Ministry for suitable amendments to environmental clearance condition wherever necessary.	The amendment in Environment Clearance (EC) condition for permitting to change of coal source for Gadarwara has been accorded by MOEF&CC vide letter no. **J-13012/125/2009-IA.II(T)** dated 07/02/2019.
iii	Bi-flue stack of 275 m height with flue gas velocity not less than 22 m/s shall be installed and provided with continuous online monitoring equipment's for SOx, NOx and PM2.5 & PM10. Mercury emissions from stack may also be monitored on periodic basis.	A bi-flue stack of 275 meters height has been constructed and minimum flue gas velocity of 22 m/sec will be ensured during operation phase of the project. Continuous stack monitoring facility for online measurement of SO2, NOx, Particulate Matter (PM) and Mercury level has been provided. The photographs of the Stack and Technical Details of stack are enclosed as **Annexure–II.**
iv	No mine void filling or filling up of low lying areas with fly ash shall be undertaken.	No mine void filling shall be done. If required in future at all, due permissions shall be taken from appropriate authority. No low lying area shall be filled, however ash may be used for engineered fills leveling, backfilling or reclaiming of low lying area and also for raising plant plinth levels.
v	COC of 5.0 shall be adopted	Closed cycle cooling system has been designed with COC of 5.0 for optimisation of water requirement
vi	Continuous monitoring of Narmada River water quality in its upstream and downstream of water tapping point shall be undertaken regularly and records maintained.	Continuous monitoring of Narmada River water quality in its upstream and downstream of water tapping point shall be undertaken regularly during operation phase of the project.
vii	The project proponent shall explore possibility for storage of excess monsoon water for use during lean season. The same could be by construction of barrage at appropriate location which could be carried out in close consultation with the WRD, Govt. of Madhya Pradesh.	Gadarwara project has already constructed weir on Narmada River in consultation with WRD, Government of Madhya Pradesh.

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viii	The ash pond design shall be such that no breach takes place even in the worst case of natural calamity. Since the geology of the area indicates sandy loam and loamy soil, the ash pond need to be appropriately lined with appropriate impermeable media.	All the engineering practices have been followed for the construction of Ash Dyke. It has been designed with adequate factor of Safety. The design of ash dyke also takes into consideration the seismic parameters. Regular monitoring and inspection of ash dykes will ensure no risks of failure. To avoid the ground water contamination ash pond is lined with impermeable material i.e. Bentonite blended clay & High Concentrated fly ash slurry. Moreover, the Fly Ash Disposal System for the project envisages the use of High Concentration Slurry Disposal (HCSD) System, which leads to solidification of the layers of ash slurry within 1-2 days. The solidified layers of ash shall be self-supporting and there will be no risk of ash flowing in the surrounding areas. For disposal of bottom ash, a conventional slurry disposal system with ash water recirculation has been envisaged.
ix	Ash pond for Stage-II (400 acres) can be considered only after the first ash pond is dispensed with by filling up of bottom ash and demonstration of 100% fly ash utilization established within four years of commissioning of the plant. The 2nd ash pond for Stage-II (400 acres) requirement should not arise and land earmarked can be converted for green belt and or water storage.	Noted and shall be complied. Noted
x	Long term study shall be carried to assess impact on the ecology of the river Narmada downstream of the present project site at a different location especially at tapping points for drinking water supply and irrigation. The study shall be carried out by an institute of repute like IIT, Roorkee preferably within six months and report submitted to the Ministry. Thereafter the study shall be repeated after commissioning of both units of 2x800 MW and report subsequently submitted to the Ministry.	Study on impact of water intake and of effluent discharge for the project on ecology of River Narmada has been awarded to Centre of Advanced Study in Marine Biology, Annamalai University, Chennai vide LOA dated 17.03.2015. The copy of the final report is enclosed as **Annexure-III.**
xi	The project proponent shall explore setting up of R.O System to treat cooling tower blow down discharge of about 5 cusecs and the R.O system shall be so designed so as to take care of drinking water supply for the nearest few villages.	Possibility shall be explored for setting up of RO System to treat cooling tower blow down discharge of about 5 cusecs to take care of drinking water supply for nearby villages.
xii	The village ponds / surface water bodies located within 5 kms radius of the project site shall be	Under Various community CSR-CD works following initiatives were undertaken:

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	regenerated in the as part of its social welfare activities.	Five ponds in project affected villages (PAVs) have been identified for deepening. Three (03) ponds deepening activity completed another two (02) pond deepening work in progress.
xiii	An amount of Rs 45.60 Crores as one time investment shall be earmarked for activities to be taken up under CSR during construction phase of the Project. A detailed CSR Action Plan be furnished to the Ministry within 3 months. Recurring expenditure for CSR thereafter shall be Rs 9.2Crores per annum till the life of the plant. Social Audit by a reputed University or an Institute shall be carried out annually and details to be submitted to MOEF besides putting it on Company's website.	A requisite fund of Rs 45.60 Crore has been earmarked for Community Development works for Gadarwara project and out of which expenditure of Rs 27.16 crore has been already done regarding Community Development works in the neighboring villages. Detail and Status of CD-CSR work is enclosed as **Annexure-IV.** Thereafter, an amount of Rs. 9.2 Crores per annum will be earmarked as recurring expenditure for R&R/CSR activities till the life of the plant and its expense details will be submitted to the Ministry. In addition the social audit will be carried out as per the stipulations and its report will be submitted to MOEF&CC besides putting it on Company's website.
B. General Conditions		
(i)	Vision document specifying prospective plan for the site shall be formulated and submitted to the Regional Office of the Ministry within six months.	NTPC vide letter dated 08.04.2013 has already submitted the Project Vision Document to the Regional Office (Western Zone) of the Ministry of Environment and Forest & Climate Change (MOEF&CC), Bhopal. Copy of vision document is already submitted to regional MoEF&CC office Bhopal.
(ii)	Scheme for implementation for harnessing solar power within the premises of the plant particularly at available roof tops shall be formulated and status of implementation shall be submitted periodically to the Regional Office of the Ministry.	Installation and Commissioning of 1200 KW of Rooftop Solar PV panels is envisaged. In the 1st phase process of installation of 700 kW Rooftop Solar PV panels have already started.
(iii)	Provision for installation of FGD shall be provided for future use.	Contract has been awarded to ISGEC on 18.08.2018 for installation of FGD.
(iv)	Coal transportation to plant site shall be undertaken by rail and no road transportation shall be permitted.	Construction work of railway line from Bohani near Gadarwara to NTPC plant site is under progress and it will take some time for completion. Therefore presently coal is being transported by road from Gadarwara Railway Station to NTPC Plant site. The required amendment in Environment Clearance (EC) condition for permitting the coal transportation by road for Gadarwara has been accorded by MOEF&CC vide letter no. **J-13012/125/2009-IA.II(T)** dated 07.02.2019.

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(v)	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) be put in place.	Once the supply of coal is established on regular basis detailed study on chemical composition of coal used, for particularly heavy metal and radio activity contents, shall be carried out through a reputed institute once the project starts receiving the coal during operation phase. Meanwhile, Consultancy Work for undertaking long term study of radio activity was awarded to 'BARC' for analyzing natural background radiation monitoring at Gadarwara project. The radio activity study awarded to 'BARC' has done all initial sampling and report is under preparation.
(vi)	Utilization 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.	Expression of Interest was published, and efforts are being made for maximum utilization of fly ash from this project. ACC cement Kymore, Prism cement Satna, and MP Birla Corporation Maihar have shown their interest. Meanwhile auction through MSTC Limited has been initiated for the quantity 3000 MT/day. The action plan prepared is enclosed as **Annexure-V**
(vii)	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm3.	High Efficiency Electrostatic Precipitators (ESP) are designed and installed for achieving guaranteed efficiency of 99.99 %. Details of ESP design parameters attached. **Annexure-VI**
(viii)	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.	Dust extraction system at Coal crusher house and adequate no. of dust suppression systems are being provided in coal handling area including coal stock yard area, ash handling points, transfer points and other vulnerable dusty areas for control of fugitive dust Emissions. Dry fog dust suppression system has been provided at coal conveyor transfer Points. Water sprinklers installed at dust prone sites in order to attenuate fugitive dust emission.
(ix)	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.) shall 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.	An ash management scheme shall be implemented consisting of dry ash extraction system (DAES) for dry collection of fly ash with storage facility (silos). Supply of ash to entrepreneurs for utilization and promoting ash utilization to maximum possible extent and safe disposal of unused ash in the ash pond area.

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		The plant shall have two different systems for ash disposal– conventional wet slurry disposal with ash water re-circulation for bottom ash and High Concentration Slurry Disposal (HCSD) for disposal of unused fly ash. Periodic monitoring for mercury & heavy metals in the bottom ash and water emanating from ash pond shall be done during the operation phase of the project. No ash shall be disposed off in low lying area.
(x)	Ash pond shall be lined with HDPE/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. Ash pond water shall be re-circulated and utilized.	To avoid the ground water contamination ash pond is lined with impermeable material i.e. Bentonite blended clay & High Concentrated fly ash slurry. All the engineering practices have been followed for the construction of Ash Dyke. It has been designed with adequate factor of Safety. The design of ash dyke also takes into consideration the seismic parameters. Regular monitoring and inspection of ash dykes will ensure no risks of failure. AWRS system has been also envisaged.
(xi)	Fugitive emissions shall be controlled to prevent impact on such that no agricultural/non-agricultural land. Impact to any land shall be mitigated and suitable compensation provided in consultation with the local Panchayat.	Adequate no. of dust suppression and extraction system shall be provided in coal handling area including coal stock yard area, ash handling points, transfer areas and other vulnerable dusty areas for control of fugitive dust Emissions. Extensive plantation shall be undertaken in all available areas, selectively with Air Pollution Tolerant Index (APTI) plant species.
(xii)	Hydrogeology of the area 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 any deterioration is observed specific mitigation measures shall be undertaken and reports / data of water quality monitored regularly and maintained shall be submitted to the Regional Office of the Ministry.	During operation phase of the project the Hydrogeology of the area shall be reviewed annually from an institute/ organization of repute to assess impact of surface water and ground regime (especially around ash dyke) and reports of water quality monitored shall be submitted to the Regional Office of the Ministry. Hydro-geological study for Gadarwara project has been carried out by National Institute of Hydrology (NIH) Roorkee. A copy of the report has been submitted to the Regional Office of the Ministry.
(xiii)	No ground water shall be extracted for use in operation of the power plant even in lean season.	As per the said stipulation, no ground water will be extracted for use during operation of the power plant.

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(xiv)	No water bodies (including natural drainage system) in the area shall be disturbed due to activities associated with the setting up/operation of the power plant.	No water body including natural drainage system of the area has been disturbed due to activities associated with the setting up of the power plant. Moreover, the said stipulation will also be complied during the operation phase of the project.
(xv)	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 not adversely affected due to the project.	Adequate nos. of piezometers will be installed for regular monitoring of ground water level in and around ash pond area as per stipulation and report will be submitted to Regional Office (Western Zone) of MOEF&CC at Bhopal at regular interval during operation phase of the project.
(xvi)	Monitoring surface water quality in the area 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.	Monitoring of surface water quality shall be carried out regularly as per stipulations and reports shall be submitted to Regional Office of MOEF&CC (Western Zone) at Bhopal. Monitoring for heavy metals in ground water will be also done and it's record will be maintained during operation phase of the project. Copy of latest report enclosed as **Annexure-VII**
(xvii)	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.	Noted.
(xviii)	The treated effluents conforming to the prescribed standards only shall be re- circulated and reused within the plant. Arrangements shall be made that effluents and storm water do not get mixed.	The project shall have an integrated scheme for treatment, re-cycle and re use of effluents. Provision is being kept to recirculate cooling water and ash pond effluent. The cooling tower blow down shall be used fully/partially for ash handling, service water system, coal handling & firefighting etc. Provision is being kept for treatment, recirculation & reuse of entire quantity of coal handling plant effluents & service water effluents. The effluent treatment system comprising of neutralization pit for DM plant regeneration waste, oil separator/skimmers for oily waste, coal slurry settling pond for coal handling plant effluents, lamella clarifier for service water effluents and cooling towers for hot water etc are being provided. The effluents shall be treated adequately conforming to the stipulated regulatory

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		standards. An independent plant effluent drainage system shall be constructed to ensure that plant effluents do not mix with storm water drainage. Zero Liquid discharge Scheme implemented ensures plant effluent do not mix with storm water drainage.
(xix)	Waste water generated from the plant shall be treated before discharge to comply limits prescribed by the SPCB/CPCB.	It is submitted that during normal course of project operation Zero Liquid Discharge (ZLD) system is adopted based on maximum recycle/reuse of waste water for various plant usage thereby reducing and optimizing the quantities of water requirement and effluent generation to the extent feasible. However, NTPC has already revised its water requirement in order to comply with the latest emission notification by MOEF&CC for TPP dated 07.12.2015.
(xx)	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising green belt/plantation.	All domestic sewage emanating from plant and township shall be treated in a sewage treatment plant. The treated sewage conforming to prescribed standards and shall be utilized for plantation & raising greenbelt to the extent possible.
(xxi)	The project proponent shall undertake rain water harvesting measures and shall develop water storage for use in operation of the plant. Rain water harvesting system shall be put in place which shall comprise of rain water collection from the built up and open area in the plant premises. Action plan for implementation shall be submitted to the Regional Office of the Ministry.	Rain water harvesting shall be practiced as per recommendation/stipulations of Central Groundwater Authority/Board. A study was conducted by NIH Roorkee for rain water harvesting at plant area and for township. Proposal for implementation plan has been submitted to CGWB-Bhopal for their approval.
(xxii)	Additional soil for leveling of the proposed site shall be generated within the sited (to the extent possible) so that natural drainage system of the area is protected and improved.	All additional soil leveling of the project site will be done from within the sites only with all necessary precautions will be taken to protect natural drainage system of the area.
(xxiii)	Common property resource falling in the vicinity of the project area shall be identified and if any common property resource (such as grazing land, pond etc.) is falling within the plant area and is developed and handed over to the community.	There is no common property resource falling within the plant area.
(xxiv)	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.	The entire fire system in NTPC Gadarwara plant is catered by - Hydrant pumps- 3 Motor driven + 1 Diesel driven Booster pumps in hydrant line-

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		1 Motor driven + 1 Diesel driven Spray pumps - 2 Motor driven + 1 Diesel driven Booster pumps in spray line- 1 Motor driven + 1 Diesel driven Following areas are covered by Hydrant and Spray Systems for fire protection 1) Hydrant system : Through piping network and valves covers entire main plant and offsite area 2) Hydrant Booster pumps : It is provided to supply adequate pressure in hydrant system of Boiler and elevated area like Bunker Transfer points 3) High Velocity Sprinkler system : It has been provided in areas where Oil is being used transformers, Turbine Driven BFPs, Boiler burner floors, Turbine lube oil system, Oil canal, Generator seal oil units. 4) Medium Velocity Sprinkler system: Coal conveyors and Transfer points, LDO Tanks, DG Sets, Cable galleries at various levels at TG Building
(xxv)	Well-designed acoustic enclosures for the DG sets and noise emitting equipment's to achieve the desirable insertion loss viz. 25 dB (A) should be provided.	Well-designed acoustic enclosures meeting the latest statutory norms for DG sets are provided. The Noise Monitoring report is enclosed as **Annexure-VIII.** Further, the compliance of latest norms on noise standard will be ensured.
(xxvi)	Storage facilities for auxiliary liquid fuel such as LDO/HFO/LSHS shall be made in the plant area in consultation with department of Explosives, Nagpur; Sulphur content in the liquid fuel shall 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.	Storage facilities for auxiliary liquid fuel LDO/HFO are designed conforming to the safety standards and where risk is minimal. A detailed Disaster Management Plan & Risk assessment including fire and explosion issues prepared and finalized in consultation with Department of Explosives, Nagpur and regular mock drills are being conducted as per plan in order to address any eventuality in case of an accident. Displayed on Gadarwara intranet.
(xxvii)	First Aid and sanitation arrangements shall be made for the drivers and other contract workers	All arrangements related to first aid, health & safety and sanitation for workers during construction phase of the project have been

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	during construction phase.	kept under the scope of EPC contractor. However, NTPC shall ensure effective compliance of the said stipulations. Various measures implemented during construction phase through contractor are: • Adequate infrastructure facilities, such as sanitation, fuel, restroom, medical facilities, safety, and suitable water supply are being provided at various stages of project construction to the labor colonies housing the work force during construction phase of the project. The sanitary waste from these areas shall be accorded suitable treatment. • Safety equipment such as earplugs and earmuffs, helmets, face shields, safety goggles etc. is being provided to workers engaged in high risk areas. A first aid center & ambulance have been established to provide immediate medical aid to the workers and their Family members. An ambulance service is available at site to transport injured workers to nearby hospitals.
(xxviii)	Noise levels emanating from turbines shall be limited to 85 dB (A) from source. For people working in the high noise area, requisite PPEs 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.	Design specification for the equipment's has been made to comply with the stipulation. Personal protective equipment has been arranged through contractors during construction phase. Periodic examination of workers during operation phase shall be done as stipulated. The workers of generator halls and other high noise area shall be provided with appropriate ear protection devices.
xxix	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 record maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provide immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional office of this Ministry. The data shall also be put on the website of the company.	Regular monitoring of AAQ shall be done during the operation of the plant. The four locations of AAQMS have been finalized in consultation with MPPCB. Four (4) no. of AAQMS equipment's shall be installed at site and the infra-structure requirements for the stations are being established. Data shall be submitted to the Regional Office (Western Zone) of the MOEF&CC at Bhopal. The data shall also be put up on the website of the company during the operation phase of the project.
xxx	Green Belt consisting of 3 tiers of plantations of native species around plant not less than 100m width shall be raised (except in areas not feasible). The density of trees shall not less than	• Green Belt around the Main Plant area except transmission corridor shall be planted.

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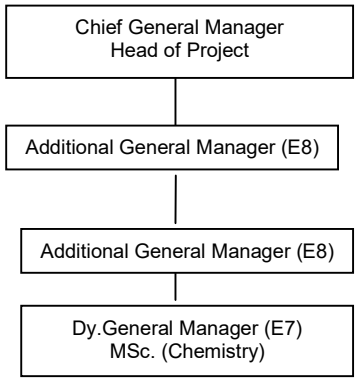
	2500 per ha with survival rate not less than 80%.	• Around 100 acres of land has been envisaged for the green belt development. • Green Belt around the Township area shall be planted. • Extensive afforestation has been undertaken at all available spaces in and around project. • Avenue Plantation along the Road is being done. • The density of trees shall not less than 2500 per ha with all efforts to maintain the survival rate not less than 80%. • Under development of green belt work 40,000 trees have been planted at project in 2018. Details attached in **Annexure- IX**
xxxi	An Environmental Cell comprising of at-least one expert in environmental science / engineering, occupational health and a social scientist, shall be created preferably at the project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall directly report to the head of the organization who would be accountable for implementation of environmental regulations and social impact improvement / mitigation measures.	An Environment Management Group (EMG) has been set up at Gadarwara STPP.  The EMG will be responsible for implementing and monitoring the stipulations/ issues / statutory norms. EMG will have sufficient trained manpower and equipment for environmental monitoring and other environmental related activities to ensure compliance with statutory requirements. It shall interact regularly with the State Pollution Control Board.
xxxii	The project proponent shall also adequately contribute in the development of the neighbouring villages. Special package with implementation schedule for providing potable drinking water supply in the nearby villages and schools shall be undertaken in a time bound manner.	Expenditure of Rs. 27.16 Crore has been spent for Community Development works in the neighboring villages. List of CD works executed in PAVs enclosed as **Annexure-IV.** Separate budget has been earmarked for implementing CSR-CD activities for the project and shall be utilized in accordance with the said stipulations.

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xxxiii	CSR scheme shall be undertaken based on need based assessment in and around the villages within 5 km of the site and in constant consultation with the village Panchayat and the District Administration. As part of CSR employment of local youth after imparting relevant training as may be necessary shall be undertaken as committed.	Various CSR schemes have been implemented and will be continued based on need based survey in and around the villages within 5 km of the site and in consultation with the village Panchayat and the District Administration. **Infrastructure works in Project** **Affected Villages (PAVs):** • CC road constructed in Village Dongargaon. • Road side plantation was done in all PAVs. • CC road construction in Village Chorbarheta. **Drinking water:** • Hand pumps installed in all 7 PAVs. • Payment disbursed for supply of piped water to each household in PAVs. **Sanitation:** • Ghat Pipariya is now open defecation free. • Payment disbursed for toilet construction in each house for Gangai & Umaria villages. • Toilets worth 29 lacs constructed in Village Chorbarheta. **Education:** • Boundary wall of schools under construction in all PAVs. • Additional room made in School at Raipur Highrer Secondary and Gangai High School • Scholarship distributed to meritorious students of Government schools of class V, VIII & X. • School Bag and Note book distributed • Sweater distributed in primary school • Chair and Table distributed to all PAVs (07) school • Desk Top computer distributed to all PAVs (07) school • Ceiling Fans distributed to all PAVs (07) school

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		Health: • 7 medical camps, one family planning and one cataract screening eye camp organized for PAVs. • Upgradation of District hospital was done. • Upgradation of Red Cross hospital was done. • Up gradation of Gadarwara Hospital completed and • Chichli PHC work in progress **Other welfare measures:** • Contribution made towards 2 camps for upliftment of weaker sections and one cultural program. • Rural Sports, Kabadi was organized at Gangai • Sewing Class for women empowerment was conducted in three villages • Computer class for PAVs Girls was organized in NTPC school • Career Counseling for Class 9 to 12 class students carried out in association of XIDAS, Jabalpur • Self defense for Girls training program conducted **Infrastructure works in Vicinities:** • Two CC road constructed in Narsinghpur. • Solar system installed in remotely located Village Badgaon. • Community Centers constructed in various villages, Gadarwara & villages, Gadarwara & Narsinghpur. • Auditorium at Gadarwara completed • Auditorium work at Chichli and Gangai in progress Detail and Status of CD works is attached as **Annexure – IV**

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xxxiv	It shall be ensured that an in-built monitoring mechanism for the CSR 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. The achievements should be put on company's website.	The said stipulation shall be complied during operation phase of the project.
xxxv	Provision shall be made for the housing of construction labor (as applicable) within the site with all necessary infrastructures 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 structure to be removed after the completion of the project.	All construction agencies working at NTPC Gadarwara Project are providing temporary accommodation for their workers near to work site. The engaged contractors are responsible for providing facilities for housing of construction labor (as applicable) within the site with all necessary infrastructures and facilities such as fuel for cooking, mobile toilets, safe drinking water, medical health care etc.
xxxvi	The project proponent shall advertise in at least two local news papers 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 seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in.	The information of Environmental Clearance was published in Two newspapers widely circulated in the region; 1. Dainik Bhaskar on 27.03.2013 (Hindi) 2. Nayi Duniya on 23.03.2013 (Hindi)
xxxvii	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila parishad/ 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.	The copy Environmental Clearance has been submitted to the following concerned offices. (1) Collector, Narsinghpur. (2) General Manager, District Trade & Industries Centre, Narsinghpur. (3) CEO, Zila Panchayat (4) Secretary, Gram Panchayat Gangai. (5) Secretary, Gram Panchayat Kudari. (6) Secretary, Gram Panchayat Chor Barheta. The Environmental Clearance has also been uploaded on the NTPC website.
xxxviii	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 (PM2.5&PM10), SO2, NOx (ambient	The latest HYC report of EC conditions is regularly being submitted to the Regional Office (Western Zone) of MOEF&CC at Bhopal and at the same time it is also uploaded on the NTPC website which is periodically being replaced with updated HYC report. Online continuous Stack Emission Monitoring System (CSEMS) for the parameters like

SL.NO.	MOEF&CC STIPULATION	STATUS AS ON 31.03.2019
	levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain	particulate matter (PM) NO_X, SO_2, Mercury are commissioned. The Data shall be uploaded to the online emission to MPPCB and CPCB server during operation phase of the project.
xxxix	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 environment statement for each financial year ending 31st March in Form-V shall be submitted once the plant becomes operational to Madhya Pradesh Pollution Control Board (MPPCB).
xl	The project proponent shall submit six monthly reports on the status of the implementations 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 their website and update the same periodically and simultaneously send the same by email to Regional office, Ministry of Environment and Forests.	Latest Six monthly reports on the status of the implementations of the stipulated environmental safeguards is regularly being submitted to the MOEF&CC/MPPCB/Regional Office (Western Zone, Bhopal) and at the same time and it is also uploaded on the NTPC website which is periodically being replaced with updated HYC report.
xli	Regional office of the Environment & Forests shall 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 shall 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 NOx (from stack & ambient air) shall be displayed at the main gate of the power plant.	A complete set of documents including Environmental Impact Assessment (EIA) Report and Environment Management Plan (EMP) along with the additional information / clarifications were forwarded on 10.03.2014 to the Regional Office (Western Region) of MOEF&CC at Bhopal.
(xlii)	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 purpose and year-wise expenditure should be reported to the ministry.	The requisite funds for environmental mitigation measures have been included in the project cost. Financial provision stipulated towards environmental mitigate measures shall not be diverted for other purposes.
(xliii)	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the	Shall be complied.

SL.NO.	MOEF&CC STIPULATION	STATUS AS ON 31.03.2019
	project by the concerned authorities and the dates of start of land development work and commissioning of plant.	
(xliv)	Full cooperation shall be extended to the Scientists/officers from the Ministry / Regional Office of the Ministry/ CPCB /SPCB who would be monitoring the compliance of environmental status.	Full cooperation shall be extended to the Scientists / officers from the Ministry / Regional Office of the Ministry at Bhopal (Western Region) / the CPCB / the MPPCB during monitoring of the project.
(xlv)	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 of modify the existing ones, if necessary.	Noted.
(xlvi)	The environmental clearance accorded shall be valid for a period of 5 years to start operations by the power plant	Noted.
(xlvii)	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.
(xlviii)	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.

A. <u>Specific Conditions:</u>
RO, MoEF&CC Stipulations:

I. The project proponent shall set up the power project as a model plant demonstrating that ecology and development can co-exists in harmony and set examples for others to emulate similar practice.

⇒ **NTPC Reply:**

In the present era of rapid urbanization, industrialization and modernization, the power industry has emerged as a masterworks that enable production of electrical energy which appeared as one of the basic & prime needs of life after water and food and also played a pivotal role in overall development. However, it is also known fact that the as every anthropogenic activity is associated with some externalities and therefore power generation through burning of fossil fuel is also having some consequences on environment which can be minimized/attenuated only through proper environmental management systems supported by state of art technologies so that balance between ecology and development can co-exists.

NTPC well accepts the facts of these externalities and likely impacts of power projects on environment. However, being a committed and socially responsible corporate citizen since its inception, sustainable power generation has always been the prime objectives of NTPC Limited since its inception. The proposed Gadarwara STPP, Stage-I (2x800 MW) has been planned as an example of the effort of NTPC towards achieving this objective for generating and providing reliable power at competitive prices in a sustainable manner by optimizing the use of multiple energy resource with innovative eco-friendly technologies thereby contributing to the economic development of the nation, social upliftment of the society and promoting a healthy environment.

In pursuance of above, NTPC Gadarwara Project is committed install the adequate mitigative measures for controlling the air emission/pollution from the project and maintain the ambient air quality in the surrounding area within latest NAAQ limit and also to comply with the latest emission standards for Thermal power plant dated 07.12.2015. Some mitigative measures proposed to be adopted for ensuring minimal degradation of the environment due to the operation of the proposed power project are as follows;

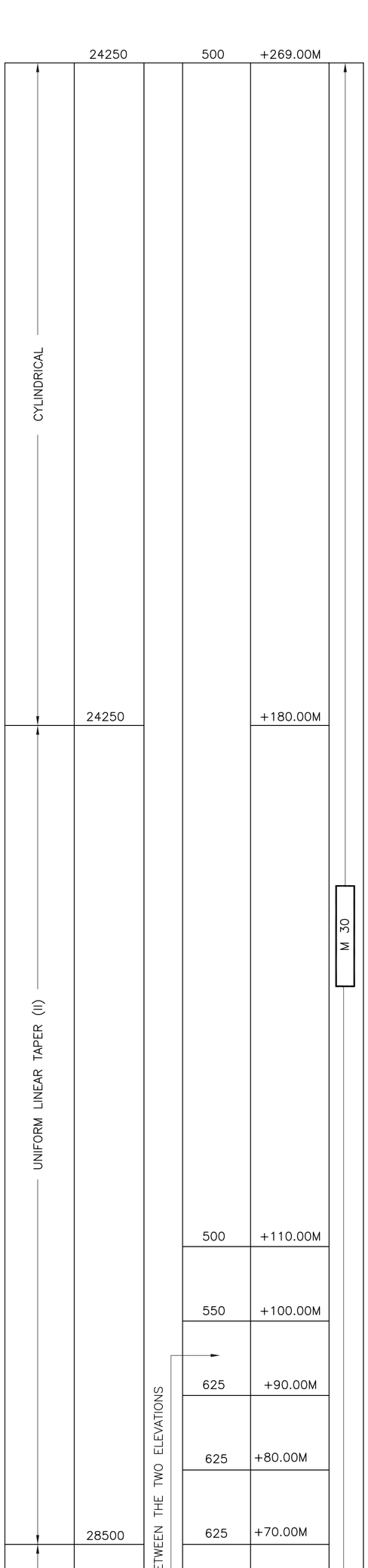
- ✓ The proposed project is designed with super-critical technology having higher efficiency compared to the conventional sub- critical technology based units. Adoption of higher cycle parameters will improve power plant efficiency and thereby reduce coal consumption per unit of electricity generation with consequent reduction in CO_2 emissions. The super critical technology is relatively new to the Indian Power sector; where till recently, plants were operating on sub-critical parameters. These super critical units have a cycle efficiency of around 4-5% more than conventional sub-critical technology and

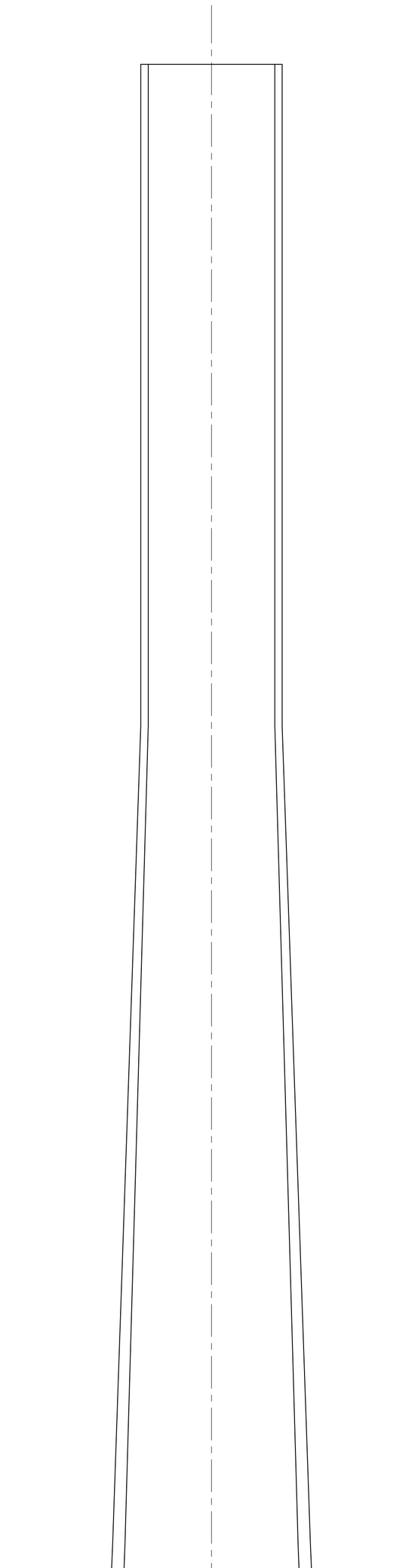
consume 5% less fuel for the same amount of energy generated. This results in consequent reduction in CO_2 foot print.

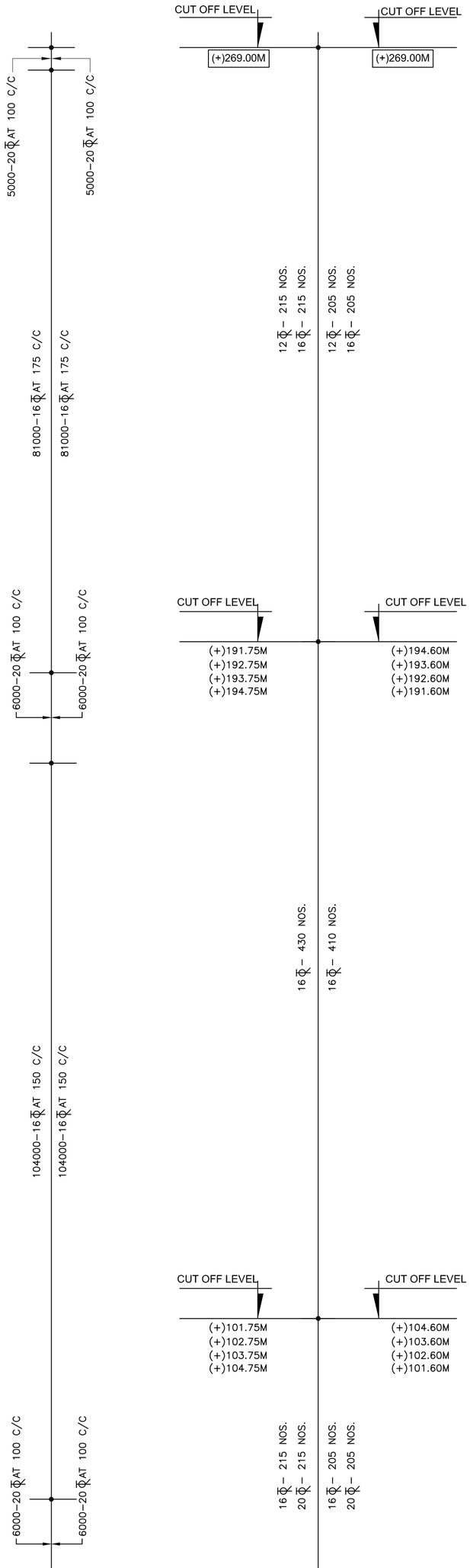
- ✓ Installation of high efficiency electrostatic precipitators (ESPs) to limit the particulate emission to 30 mg/Nm^3.
- ✓ Twin flue stack of 275 m height for wider dispersal of remaining particulates and gaseous pollutants resulting in lower ground level concentrations.
- ✓ Installation of Flue Gas De-sulphurization (FGD) system for removal of excess sulphur dioxide (SO_2).
- ✓ Suitable technology for controlled emission of NO_x.
- ✓ The project will be designed with zero Liquid Discharge (ZLD) concept in order to reduce the quantity of effluents generated from the plant
- ✓ About 150 acres of land has been envisaged for the development of thick green belt (within all available spaces of the project area & township which will attenuate the impact of air pollution and also play a vital role in offsetting the carbon footprint.
- ✓ The ash disposal scheme for fly ash envisages collection of fly ash by DAES (dry ash extraction system) to the storage silos and residual fly ash transported through HCSD (High Concentration Slurry Disposal system), which uses thick – viscous – high concentration slurry of ash for disposal which gets solidified within 1-2 days, thereby minimizing the possibility of fugitive emission. Under the above disposal system there is no risk of Ash flying in the wind due to its being cemented
- ✓ Dust suppression and extraction system shall be installed at coal handling plant area and ash handling plant to control fugitive dust emission.
- ✓ Water spraying shall be done at all dust generation areas viz., the coal and ash handling areas.
- ✓ Regular monitoring of ambient air quality parameters through three nos. fixed Continuous Automatic Ambient Air Quality Monitoring Stations (AAQMS) as well as portable Ambient Air Quality Monitoring equipment.
- ✓ Continuous emission monitoring system in stack for all the flues.

Hence, it can be concluded that implementation of above practices/technology at proposed Gadarwara project will enhance the power Generation Efficiency in eco-friendly manner.

DRG. NO. 9572-315-POC-C-0554 REV. NO. 0







HORIZONTAL REINFORCEMENT

VERTICAL REINFORCEMENT

FOR DOWELS FROM FOUNDATION
REFER DRG. NO. 9572-315-POC-C-0552

SHELL REINFORCING ARRANGEMENT

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES.
2. EL (±) 0.00M CORRESPONDS TO RL (+)358.50M.
3. CONCRETE FOR CHIMNEY SHELL, SHALL BE OF GRADE M−30 CONFORMING TO IS:456 WITH MAXIMUM SIZE OF GRADED COARSE AGGREGATE NOT EXCEEDING 20 MM.
4. ALL REINFORCEMENT STEEL SHALL BE THERMO MECHANICALLY TREATED (TMT) HIGH YIELD STRENGTH BARS WITH MINIMUM PERCENTAGE ELONGATION 14.5% CONFORMING TO IS:1786.
5. LAP LENGTH IN REINFORCEMENT BARS (REBARS) SHALL NOT BE LESS THAN 42 TIMES THE DIAMETER OF BAR.
6. HORIZONTAL REBARS SHALL BE IN MANAGEABLE LENGTHS AND THE LAPS IN ANY BAR SHALL BE STAGGERED FROM THE LAPS OF BARS BELOW AND ABOVE IT.
7. THE REBAR CUT OFF LEVELS HAVE BEEN INDICATED TO SHOW THE LAP STAGGER IN THE VERTICAL REBARS. MINOR ADJUSTMENTS IN THESE LEVELS MAY BE MADE TO SUIT THE REBAR LENGTHS AVAILABLE AT SITE. MINOR LEVEL DIFFERENCES AMONGST THE BARS OF ANY STAGGER GROUP IS ALSO ACCEPTABLE.
8. MAIN REBARS SHALL BE SUITABLY CURTAILED AROUND SHELL OPENINGS AND RECESSES.
9. ALL MATERIAL, QUALITY, TESTING, STORAGE, FORM WORK, CONCRETE MIX DESIGN, REINFORCEMENT DETAILING, CONCRETE MIXING, PLACEMENT OF REINFORCEMENT AND CONCRETE, WORK−MANSHIP, SAFETY, ETC. SHALL CONFORM TO IS:456 AND THE TECHNICAL SPECIFICATIONS.

CONSTRUCTION REFERENCE DRAWINGS:-

1. REFER DRG. No. 9572−315−POC−C−0552 FOR DOWELS FROM FOUNDATION.
2. REFER DRG. No. 9572−315−POC−C−0555 THROUGH 0563 FOR EXTRA REINFORCEMENT AROUND OPENINGS AND RECESSES IN THE CHIMNEY SHELL.
3. REFER DRG. No. 9572−315−POC−C−0564 FOR DETAILS OF EXTERNAL PLATFORMS.
4. REFER DRG. No. 9572−315−POC−C−0565 FOR DETAILS OF EMBEDMENT SLEEVE NUT ASSEMBLY FOR INTERNAL GALLERY AT EL(+)43.50M.
5. REFER DRG. No. 9572−315−POC−C−0583 & 0584 FOR LAYOUT & DETAILS OF STAIRCASE EMBEDMENTS.
6. REFER DRG. No. 9572−315−POC−C−0589 FOR LAYOUT & DETAILS OF STRAKES/STRAKE EMBEDMENTS.

SPECIAL NOTE:−
STRAKE EMBEDMENTS AND STRAKES SHALL BE INSTALLED SIMULTANEOUSLY WITH THE CASTING OF THE CHIMNEY SHELL. ADEQUATE SUSPENSION ARRANGEMENTS SHALL BE MADE FROM THE SLIPFORM STRUCTURES TO INSTALL THE STRAKES AS THE CASTING PROGRESSES. FOR LAYOUT & DETAILS OF STRAKES & STRAKE EMBEDMENTS, REFER DRG. NO. 9572−315−POC−C−0589

एन टी पी सी NTPC
RELEASED FOR CONSTRUCTION
16.04.2014 DATE
Sd/−(AAT) SIGNATURE

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M (L)	E	C	C&I	ARCH.	APPD	DATE
0	RELEASED FOR CONSTRUCTION	DEEP	AAT	SB	--	--	SU	--	--	SU	16.04.14
					CLEARED BY						

एन टी पी सी लिमिटेड
NTPC Limited
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: GADARWARA SUPER THERMAL POWER PROJECT
STAGE-I (2x800 MW)

TITLE: MAIN PLANT AND OFFSITE CIVIL WORKS PACKAGE
CHIMNEY-SHELL PROFILE AND DETAILS OF MAIN REINFORCEMENT

SIZE	SCALE	DRG. NO.	REV. NO.
A1	N.T.S.	9572-315-POC-C-0554	0

CAD FILE NAME : 9572−315−POC−C−0554

STUDY ON IMPACT OF WATER INTAKE FOR GADARWARA STPP ON ECOLOGY OF NARMADA RIVER (MADHYA PRADESH)

Submitted to:

NTPC Ltd.

Engineering Office Complex
Sector-24
Noida (Uttar Pradesh)
PIN- 201301

ANNAMALAI UNIVERSITY

CENTRE OF ADVANCE STUDY (CAS) IN MARINE BIOLOGY

PARANGIPETTAI- 608502 (TAMIL NADU)

August, 2017.

STUDY ON IMPACT OF WATER INTAKE FOR GADARWARA STPP ON ECOLOGY OF NARMADA RIVER (MADHYA PRADESH)

Submitted to:

NTPC Ltd.

Engineering Office Complex
Sector-24
Noida (Uttar Pradesh)
PIN- 201301

ANNAMALAI UNIVERSITY

CENTRE OF ADVANCE STUDY (CAS) IN MARINE BIOLOGY

PARANGIPETTAI- 608502 (TAMIL NADU)

EXECUTIVE SUMMARY

The present ecological survey was carried out to ascertain the feasibility of setting up of a power plant (1980 MW coal based plant namely Gadarwara Super Thermal Power Plant (STPP) based on supercritical technology) in Gadarwara, Madhya Pradesh. The power plant has planned to draw fresh water for condenser cooling from Narmada River. The sampling station were fixed taking into account the intake and outlet point of power plant besides the proximity of water in the above said two regions and also control point, which would be a referral point where the impact can be assessed. Out of 5 stations, four stations (A2, A3, A4 & A5) fall in Narmada River and one station (A1) at confluence point Sita River and Shakkkar River. In the proposed project area, the baseline information's was generated as per the norms stipulated by the by the Ministry of Environment and Forest and Climate Change (MOEF&CC), Govt. of India. To accomplish this task, a research team consisting of five Assistant Professors with their chosen field of interest and four Research Scholars from Centre of Advanced Study (CAS) in Marine Biology of Annamalai University carried two surveys during October, 2015 (post monsoon) and May, 2016 (pre monsoon). During survey water samples from 5 different stations were collected across two different depths (surface and subsurface), sediment and biological samples were also collected from all the stations.

The present ecological survey, which lasted for two surveys revealed the following facts: The physico-chemical parameters, did not exhibit wide variations. However, TSS and Turbidity showed an elevated range due to the dynamic nature of the environment. The surface water temperature varied from 24^0 to 29^0 C, which might due to the typical seasonal, geographical location and sampling time. The distribution of pH in surface waters remained alkaline invariably in all stations. Likewise, the observations made on the prime physical factors such as the turbidly also registered maximum with 30.6 NTU in station A4. This abnormality in this parameter is might be due to

constant dynamism in the water flow with turnover of nutrients from bottom to surface layer.

Further, the ecologically sensitive chemical parameters such as Dissolved Oxygen and water nutrients were also at the optimal concentration, which very well corresponding to the seasonal variation. The oxygen level in the water varied between 4.4 (A3) and 5.6 mg/l (A5). As observed in other parameters the water nutrients such as ammonia, nitrite, nitrate, inorganic phosphate and silicate were also found to be permissible range. Similarly, soil textural composition indicated that the sand and silt were higher in most of the stations which might be due to sediment transportation. Similarly, the metal concentrations recorded in the present study are comparatively less than the levels reported in rivers waters elsewhere.

Regarding plankton diversity, only a total 44 species phytoplankton belonging to three groups Chlorophyceae, fourteen to Bacillariophyc eae and ten to Cyanophyceae and 27 species of zooplankton belongings to the rotifers had 10 species, followed by Cledoceran with 07 species, and Copepod with 5 species and protozoan with 05 species in all the stations collected.

The potential environmental impacts due to project activities expected to be temporary and reversible. The proposed mitigation measures for the impacting activities are sufficient. All negative impacts during and post construction, including those deemed "significant" can be properly mitigated and no comprehensive or irreversible adverse impacts have been identified.

NTPC LIMITED
GADARWARA SUPER THERMAL POWER PROJECT
EXPENSES INCURED AS ON 30.03.2019

B	COMMUNITY DEVELOPMENT		Actual Approve (Rs.in Cr)	Broad Description	Activities	RAP (in Lacs)	Approved (in Lacs)	Disbursed (in Lacs)	Balance (in Lacs)	Blance RAP	Remarks
B.1	**CD works in PAVs**			PAVs-Project Affected Villages							
B.1	B.1.1	Infrastructure works **	10.8075	Construction of cement concrete (CC) roads & drainage, community halls, Panchayat bhawan, weekly market places (02), passenger shelter, welcome gates, playgrounds, river bank ghat, public orchard, tree plantation, solar lights, etc	CC ROADS	1,080.75	963.34	887.84	75.50	117.41	cc roads in all Pav's
	B.1.2	Drinking water	3.033	Overhead tanks & pipelines, hand-pumps, deepening of pond.	Hand pumps	303.30	154.27	152.98	1.29	149.03	Hand pumps in all PAv's
	B.1.3	Sanitation	2.9435	Individual toilets in all households, common urinal, public garbage dumping place.	Toilets	294.35	214.14	214.14	- 0.00	80.21	Rs. 32.08 (45.90) reapportion for toilets in all Pav's
	B.1.4	Education	3.67	Construction of Anganwadi, additional rooms in schools, kitchen sheds, study material, computers, books, sports item, etc	Merit scholarship to students	367.00	334.83	103.82	231.01	32.17	Merit scholarship to students in all PAv's
	B.1.5	Health	0.882	Providing Ambulance, medical camps, additional room in Govt dispensary	medical camps,	88.02	12.99	5.89	7.09	75.03	medical camps, in all Pav's
	B.1.6	Other Welfare measures	2.55	Providing water tanker, utensils, support to Indira Awas Scheme of Govt. for BPL's, Rural Sports, PAPs ID card, Cooperative societies formation, Empowerment etc	Water tanker	255.00	46.51	26.17	20.34	208.49	water tanker in all Pav's
	SUM B.1		TOTAL	B1.1 +B1.2+ B1.3+ B1.4+B1.5 +B1.6		**2,388.42**	**1,726.07**	**1,390.84**	**259.73**	**662.35**	

B	COMMUNITY DEVELOPMENT (CD)		Actual Approve (Rs.in Cr)	Broad Description	Activities	RAP (in Lakhs)	Utilise (Amount in lacs)	Actual Expenditure in Lakhs	Balance	Blance RAP	Remarks
B.2	**CD works in project vicinity**			CD in vicinity villages/Tehsil town/District						-	
	B.2.1	Infrastructure works*	12.0434	Construction of CC roads & drainage, community halls, public orchard, facilities at railway station , solar lights, Indoor stadium with **Auditorium^** & swimming pool at Narsinghpur, Outdoor stadium with **Auditorium** at Gadarwara, etc	Gadarwara	1,572.62	960.56	779.30	181.27	612.06	Town Hall,CC road and Pavers fixing
			1.0508	Amount can be utilized for **Auditoriums^/** activities to be taken up in future as per consensus in VDAC/ directed by GoI/ GoMP.	Auditorium					-	Narsingpur, Gadarwara
			2.632	Cement Concrete road	Construction of 7 Km (Village Khadai-Sawari in tribal area, south of project site) (Special CD					-	
		Sanitation	2.60	Construction of Public toilets in various villages in Narsinghpur			260.00	260.00	-	-	Narsingpur, Gadarwara
	B.2.2	Drinking water	0.25	Drinking WaterWater	Hand-pumps	25.00	8.40	8.40	0.00	16.60	Hand Pumps Raipur, Chandankheda, Heerapur
	B.2.3	Education	2.675	Construction of Anganwadi, additional rooms in schools, sheds, study material, computers, books, sports item, etc	School activities	267.50	210.57	195.09	15.48	56.93	
	B.2.4	Health	3.0625	Ambulance, health center up-gradation, medical camps, awareness camps, etc.	Health Facilities	306.25	87.06	83.03	4.03	219.19	Narsingpur, Gadarwara
			TOTAL	**B2.1 +B2.2+ B2.3+ B2.4**		**2,171.37**	**1,526.59**	**1,325.82**	**200.77**	**644.78**	
						4,559.79	**3,252.67**	**2,716.66**	**460.51**	**1,307.12**	

NTPC-Gadarwara fly ash utilization / disposal action plan -2019-20

S.No.	Action proposed for Fly ash utilization / disposal	Via (means)	Expected Quantity 2019-20	Readiness
1	**Formation of Impervious layer**	Pipe line	@ 3000 MT/day(Approx)	Sep'2019
2	**Brick Manufacturing and others**	Through bulker / closed containers.	@ 600 MT/Day (Approx)	Immediately Free issue to brick manufacturers / RMC / LWA
3	**Auction through MSTC**	Through bulker / closed containers.	3000 MT / Day (Approx)	Proposal initiated for auction of fly ash through M/s MSTC Limited
4	**Low lying area filling (Pond ash)**	NTPC own land		Ravines filling, for developing the area in and around plant premises.
		Private land		Up to 50 km of power plant
		Govt. Land		In consultation with revenue officer (SDM)/ Mining officer.
5	**Setting up of ash Brick unit**	Fly ash brick manufacturing shall be started inside the plant premises preferably to PAPs		
6	**Development of Road embankment (Pond ash)**	NHAI, PMGSY, MP Rural Road Development Corporation exploring the possibilities.		

Annex. V

NTPC Gadarwara

Sl No	ESP Design Parameters	Unit	ESP Guarantee Point	ESP Design Point
1.	Gas Flow	m3/s	1354	1465
2.	Gas Temperature	Deg C	127	145
3.	Inlet Dust Concentration	gm/Nm3	60.64	73.07
4.	No of fields out of operation	--	Nil	One
5.	Required outlet concentration	mg/Nm3	18	51
6.	ESP Collection Efficiency	%	99.97	99.93

Mahabal Enviro Engineers Pvt. Ltd.

Engineers, Consultants, Environmental Monitoring Laboratory & Contractors
Plot Nos. 13,14,17,18, Grampanchayat Bokhara, 8 km from Nagpur City,
Opp. Patel Petrol Pump, Chhindwara Road, Koradi, Dist.Nagapur-441111
Phone : 91-712-2612162 **T/Fax:** 91-712-2612212 **Email:** nagpur@mahabal.com

Water Sample Analysis Report

Report No.: ME-NG6902-181222-SA-NTPC-NARSINGHPUR			**Date:** 22.12.2018
Name and Address of Customer	**NTPC LIMITED GADARWARA STPP** Tehsil- Gadarwara, Village-Dongargaon, P.O. Gangai, Dist.- Narsinghpur, Madhya Pradesh – 487770, India.		**Order Reference:** PO.No.5500028099-057-1049 Dtd.03.11.2017 (version: 0)
Sample Description/Type	Surface Water	**Sample Collected by**	Laboratory
Sampling Location	Narmada Rivar (Kakara Ghat)	**Sample Quantity/Packing**	5 L X 1 No. PVC Can 100 mL X 1 No. PVC Can 500mLX1No.Sterile Glass Bottle
Date of Sampling	13.12.2018	**Date of Receipt of Sample**	15.12.2018
Sampling Procedure	IS:3025(Part I): 1987 RA2003, APHA 23rd Ed. 2017, 1060-B, 1-40; 9060 A,9-36		
Date of Start of Analysis	15.12.2018	**Date of Completion of Analysis**	22.12.2018

Sr. No.	Parameter	Unit	Result	Method Reference
1.	Temperature	°C	28	APHA 23rd Ed. 2017, 2550-B, 2-74
2.	pH	-	7.8	APHA 23rd Ed. 2017, 4500-H^+-B, 4-95
3.	Electrical Conductivity	µS/cm	258	APHA 23rd Ed. 2017, 2510- B, 2-58
4.	Total Dissolved Solids	mg/L	140	IS 3025 (Part 16):1984 Reaffirmed 2006, Ed.2.1(1999-12)
5.	Total Suspended Solids	mg/L	<5	APHA 23rd Ed. 2017, 2540-D, 2-70
6.	Ca-Hardness (as $CaCO_3$)	mg/L	64	APHA 23rd Ed. 2017, 3500-Ca-B, 3-69
7.	Mg-Hardness (as $CaCO_3$)	mg/L	54	APHA 23rd Ed. 2017, 3500-Mg- B, 3-86
8.	Biochemical Oxygen Demand (3 days 27rdC)	mg/L	4.0	IS 3025 (Part 44): 1993, Reaffirmed 2009
9.	Chemical Oxygen Demand	mg/L	15	APHA 23rd Ed. 2017, 5220-B, 5-18
10.	Fluoride (as F)	mg/L	0.567	APHA 23rd Ed. 2017, 4500-F, D, 4-90
11.	Boron (as B)	mg/L	<0.1	APHA 23rd Ed. 2017, 4500-B B, 4-27
12.	Iron (as Fe)	mg/L	0.170	APHA 23rd Ed. 2017, 3111-B, 3-20

ULR- TC748718000004371F

Plot No. F-7, Road No. 21, MIDC Wagle Estate, Thane West - 400604, Maharashtra
(600 m from Hotel Rukhmini Palace Turn Opp Toyota Show Room. Next to Ashida Electrical - near J B Sawant Bus Stop)
Phone: 2582 0658/ 3139/ 1663/ 3154 Fax: 91-22-25823543 thane@mahabal.com

Sr. No.	Parameter	Unit	Result	Method Reference
13.	Cadmium (as Cd)	mg/L	N.D.	APHA 23rd Ed. 2017, 3111-B, 3-20
14.	Chromium Hexa (as Cr^{6+})	mg/L	N.D.	APHA 23rd Ed. 2017, 3500- Cr-B, 3-71
15.	Chromium Total (as Cr)	mg/L	<0.1	APHA 23rd Ed. 2017, 3111-B, 3-20
16.	Copper (as Cu)	mg/L	<0.04	APHA 23rd Ed. 2017, 3111-B, 3-20
17.	Lead (as Pb)	mg/L	N.D.	APHA 23rd Ed. 2017, 3111-B, 3-20
18.	Zinc (as Zn)	mg/L	0.059	APHA 23rd Ed. 2017, 3111-B, 3-20
19.	Arsenic (as As)	mg/L	N.D.	APHA 23rd Ed. 2017, 3114-C, 3-40
20.	Mercury (as Hg)	mg/L	N.D.	APHA 23rd Ed. 2017, 3112-B, 3-25
Microbiological Analysis				
21.	Total Colliforms	MPN/ 100mL	11	APHA 23rd Ed. 2017, 9221-B & C, 9-69, 9-72
22.	E-Coli	MPN/ 100mL	<1.8	APHA 23rd Ed. 2017, 9221-B, C & G, 9-69, 9-72 & 9-80

Remark: N.D.: Not Detected.
Values with '<' symbol indicate results below method detection limit

----------END----------

FOR MAHABAL ENVIRO ENGINEERS PVT. LTD.

Harish Mendhi
TECHNICAL MANAGER
(Chemical Testing)

Pranali Kurve
TECHNICAL MANAGER
(Biological Testing)

Note:
1. The result listed refers only to the tested sample(s) and applicable parameter(s).
2. This report is not to be reproduced except in full, without written approval of the laboratory.

ULR- TC748718000004371F

Plot No. F-7, Road No. 21, MIDC Wagle Estate, Thane West - 400604, Maharashtra
(600 m from Hotel Rukhmini Palace Turn Opp Toyota Show Room. Next to Ashida Electrical - near J B Sawant Bus Stop)
Phone: 2582 0658/ 3139/ 1663/ 3154 Fax: 91-22-25823543 thane@mahabal.com

Annex. VIII

Mahabal Enviro Engineers Pvt. Ltd.

Engineers, Consultants, Environmental Monitoring Laboratory & Contractors
Plot Nos. 13,14,17,18, Grampanchayat Bokhara, 8 km from Nagpur City,
Opp. Patel Petrol Pump, Chhindwara Road, Koradi, Dist.Nagpur-441111
Phone : 91-712-2612162 **T/Fax:** 91-712-2612212 **Email:** nagpur@mahabal.com

Noise Level Monitoring Report

Report No.: ME-NG8341-190101-SA-NTPC-NARSINGHPUR		**Date:**01.01.2019
Name and Address of Customer	**NTPC LIMITED GADARWARA STPP** Tehsil- Gadarwara, Village- Dongargaon, P.O. Gangai, Dist.- Narsinghpur, Madhya Pradesh – 487770, India.	**Order Reference:** PO.No.5500028099-057-1049 Dtd.03.11.2017 (version: 0)
Sample Description/Type	Noise Level Monitoring	
Date of Sampling	28.12.2018	
Sampling Procedure	IS 9876:1981 & manufacturer Manual	

Location	Time (h)	Unit	Result	Limit (For Industrial Zone)	
				Day Time	Night Time
Material Gate	10:40	dB(A)	60.1	75	70
CHP Area	13:40	dB(A)	42.4		
CCR Unit No.1	12:25	dB(A)	48.2		
Vikas Bhavan	12:30	dB(A)	47.1		

----------END----------

FOR MAHABAL ENVIRO ENGINEERS PVT. LTD.

Harish Mendhi
TECHNICAL MANAGER

Mahabal Enviro Engineers Pvt. Ltd.

Note:
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2. This report is not to be reproduced except in full, without written approval of the laboratory.

ULR-TC748718000005810F

Mahabal Enviro Engineers Pvt. Ltd.

Engineers, Consultants, Environmental Monitoring Laboratory & Contractors
Plot Nos. 13,14,17,18, Grampanchayat Bokhara, 8 km from Nagpur City,
Opp. Patel Petrol Pump, Chhindwara Road, Koradi, Dist.Nagpur-441111
Phone : 91-712-2612162 **T/Fax:** 91-712-2612212 **Email:** nagpur@mahabal.com

Noise Level Monitoring Report

Report No.: ME-NG8342-190101-SA-NTPC-NARSINGHPUR		**Date:**01.01.2019
Name and Address of Customer	**NTPC LIMITED GADARWARA STPP** Tehsil- Gadarwara, Village- Dongargaon, P.O. Gangai, Dist.- Narsinghpur, Madhya Pradesh – 487770, India.	**Order Reference:** PO.No.5500028099-057-1049 Dtd.03.11.2017 (version: 0)
Sample Description/Type	Noise Level Monitoring	
Date of Sampling	28.12.2018	
Sampling Procedure	IS 9876:1981 & manufacturer Manual	

Location	Time (h)	Unit	Result	Limit (For Residential Zone)	
				Day Time	Night Time
Township Area	13:30	dB(A)	42.2	55	45

----------END----------

FOR MAHABAL ENVIRO ENGINEERS PVT. LTD.

Harish Mendhi
TECHNICAL MANAGER

Mahabal Enviro Engineers Pvt. Ltd.

Note:
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ULR-TC748718000005811F

Mahabal Enviro Engineers Pvt. Ltd.

Engineers, Consultants, Environmental Monitoring Laboratory & Contractors
Plot Nos. 13,14,17,18, Grampanchayat Bokhara, 8 km from Nagpur City,
Opp. Patel Petrol Pump, Chhindwara Road, Koradi, Dist.Nagpur-441111
Phone : 91-712-2612162 **T/Fax:** 91-712-2612212 **Email:** nagpur@mahabal.com

Annex. VIII A

Noise Level Monitoring Report

Report No.: ME-NG3053-190225-SA-NTPC-NARSINGHPUR		**Date:**25.02.2019
Name and Address of Customer	**NTPC LIMITED GADARWARA STPP** Tehsil- Gadarwara, Village- Dongargaon, P.O. Gangai, Dist.- Narsinghpur, Madhya Pradesh – 487770, India.	**Order Reference:** PO.No.5500028099-057-1049 Dtd.03.11.2017 (version: 0)
Sample Description/Type	Noise Level Monitoring	
Date of Sampling	14.02.2019	
Sampling Procedure	IS 9876:1981 & manufacturer Manual	

Location	Time (h)	Unit	Result
Turbine Floor	15:00	dB(A)	89

Limit as per The Factories Act, 1948, The Maharashtra Factory Rules, 1963, Schedule XXIV

Total time of exposure per day, in hours.	Max. Sound pressure level in dB (A)
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
3/4	107
1/2	110
1/4	115

Remark :

----------END----------

FOR MAHABAL ENVIRO ENGINEERS PVT. LTD.

Harish Mendhi
TECHNICAL MANAGER

Mahabal Enviro Engineers Pvt. Ltd.

Note:
1. The result listed refers only to the tested sample(s) and applicable parameter(s).
2. This report is not to be reproduced except in full, without written approval of the laboratory.

Plot No. F-7, Road No. 21, MIDC Wagle Estate, Thane West - 400604, Maharashtra
(600 m from Hotel Rukhmini Palace Turn Opp Toyota Show Room, Next to Ashida Electrical - near J B Sawant Bus Stop)
Phone: 2582 0658/ 3139/ 1663/ 3154 Fax: 91-22-25823543 thane@mahabal.com

ULR- TC74871900003053F

Annexure-VII

Tree Plantation Status:-

	Tree Plantation Scheme	Plantation area	No. of Trees Planted	Status
1	Under Accelerated afforestation drive with the State Forest Departments of Madhya Pradesh, Bihar, Assam, Karnataka, Andhra Pradesh, Telengana and Maharashtra to plant 10 million trees..	In seven district of M.P. – 2016-17 (One time program)	Total 1 crore tree planted in all across India, Out of which 50 Lakhs tree plantation in MP. (Rest in other states)	Completed
2	Under the scheme Intended Nationally Determined Contribution (INDC-2030) creating additional Carbon Sink (10 years program)	MOU for 50 thousand tree plantation per year, through MPRVVNL in Seoni District -2016 and 2017 target completed	1 lakh tree planted	1 Lakh tree plantation for 2018 & 2019 Proposed at Near Village Chichli
3	Green Belt Development	Near Project	20000 trees	Completed through MPRVVN
		Inside Project	10500 trees	

एनटीपीसी NTPC
एक महारत्न कंपनी

एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)
गाडरवारा/ GADARWARA

NTPC-Gadarwara **Dated: 19/04/2019**

The Additional Chief Conservator of forest
Ministry of Environment, forest & Climate Change
Regional Office, MoEF (Western Zone),
Kendriya Paryavaran Bhavan,
E-5Arera Colony Link Road No.3,
Ravishankar Nagar, Bhopal (M.P.) - 462 016

Sub: EC Compliance report of NTPC-Gadarwara (2 x 800 MW)
Reference : Environment Clearance J-13012/ 125/ 2009- IA.II (T) amendment dated 07/02/2019

Dear Sir,
Please find enclosed Compliance report of NTPC-Gadarwara (2 x 800 MW) for amendment issued in Environment Clearance on 07/02/2019 of coal transportation from Gadarwara railway siding to NTPC-Gadarwara plant. Compliance report is line with the guidelines as stipulated by MoEF&CC for kind perusal please.

Thanking you,

(D. Shrikhande)

(AGM) Environment Group

गाडरवारा सुपर थर्मल पावर प्रोजेक्ट / GADARWARA SUPER THERMAL POWER PROJECT
पो : गांगई, थाना : डोंगरगाँव, तहसील : गाडरवारा, जिला : नरसिंहपुर (म प्र) - 487770
PO : Gangai, Thana : Dongargaon, Tehsil : Gadarwara, Distt : Narsinghpur (MP) - 487770
पंजीकृत कार्यालय : एनटीपीसी भवन, इंस्टीट्युशनल एरिया, स्कोप कॉम्पलेक्स, नई दिल्ली - 110003
Registered Office : NTPC Bhavan, 7 - Institutional Area , SCOPE Complex, New Delhi - 110003
Corporate Indentification No. L4010DL1975GOI007966
Tel : 07790 - 220010, Fax : 07790 - 220013, Website Address : www.ntpc.co.in

EC Compliance report of :- 2x800 MW (Stage-I) Gadarwara Super Thermal Power Project near villages Gangai, Umaraiya, Mehrakheda, Chorbarheta, Dongergaon and Kudari, in Gadarwara Tehsil, Narsinghpur Distt. in Madhya Pradesh by M/s NTPC Ltd.-reg. EC amendment issued on 07/02/2019 (File **No: J-13012/125/2009-IA.II(T)**

	MoEF &CC stipulations	**Status as on 01/04/2019**
(i)	The detail progress report of railway siding, unit-2 (1X800 MW)along with the balance work and timelines/ milestone for completion is to be submitted to the ministry as well as Regional Office within three months.	Tentative date for Synchronization of Unit#2 and loading with Coal Mills is Oct' 2019. Railway siding work is in progress Total bridges on Lead line - 21 Completed bridges - 11 Balance bridges -10 Target date of completion - 10.05.2019 Track laying 11.4km out of 22km completed Target completion of lead line - 31.05.2019 Target completion of lead line with S&T - 30.06.2019 Package completion target - 30.09.2019
(ii)-1	Road repair and maintenance is to be carried out by NTPC.	Complied. As and when required.
(ii)-2	Trucks shall be covered with tarpaulin and properly stamped to ensure that tarpaulin is properly tied with the help of rope and truck shall be fully covered so that there is no spillage of coal and/or emission of dust during transportation.	Complied. This condition has been incorporated in letter of award to the transporter / contract
(ii)-3	Continuous water sprinkling, sweeping and dust control measures shall be carried out throughout the road for minimising the air pollution.	Complied, Water sprinkling is being done at railway siding during loading and unloading of coal. Sweeping and cleaning of roads is also being complied.
(ii)-4	Plantation shall be carried out along side of the road for noise attenuation and control of air borne dust.	It is being complied and in progress.
(ii)-5	Plantation shall also be carried out on the banks of Sangam confluence of Shakkar nadi and Narmada nadi.	Plantation done at Neelkanth Ghat at the Confluence of Narmada and Shakkar river.