

**HALF YEARLY COMPLIANCE REPORT TO THE
CONDITIONS OF ENVIRONMENT CLEARANCE
(2 X 660 MW COAL BASED THERMAL POWER PLANT)
(UNIT 3 & 4)**

**ODISHA POWER GENERATION CORPORATION LIMITED
BANA HARAPALI, JHARSUGUDA, ODISHA**



SUBMITTED TO

**Ministry of Environment, Forest & Climate Change
Indira Paryavaran Bhawan
Jor Bagh,
New Delhi,
India - 110003**

ODISHA POWER GENERATION CORPORATION LTD.

(A Government Company of the State of Odisha)

CIN: U40104OR1984SGC001429



2X660MW Thermal Power Project Office: Resource Centre,
Ib Thermal Power Station, PS.: Banharpali, Dist.: Jharsuguda – 768234, Odisha,
Ph.:06645-222212 Web: www.opgc.co.in

LTR No: OPGC II – MOEF&CC – 2017 – 0117

Date: 30.05.2017

To,

The Director (Thermal),
Ministry of Environment, Forests & Climate Change
Indira Paryavaran Bhawan
Jor Bagh Road
New Delhi - 110 003

Sub: Submission of half yearly compliance report to the conditions mentioned in the Environment Clearance granted to Expansion of existing coal based thermal power plant of OPGC by addition of 2 X 660 MW (unit 3 & 4) at Banharpali in Jharsuguda district of Odisha.

Your Ref.: MoEF Letter No J-13011/59/2008-IA.II (T) dated 04.02.2010
MoEF Letter No J-13011/59/2008-IA.II (T) dated 22.01.2014
MoEF Letter No J-13011/59/2008-IA.II (T) dated 16.01.2015

Dear Sir

Kindly find the attached Compliance report to the conditions mentioned in Environment Clearance granted to Expansion of existing coal based thermal power plant of OPGC by addition of 2 X 660 MW (unit 3 & 4) for the period of Oct-2016 to March 2017.

Thanking you,

Yours Faithfully,

Ron McParland
(Executive Director, Construction, Unit 3 & 4)

Enclosure: Environment Clearance Compliance Report

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CC:

1. The Director(s), Govt. Of India, Ministry of Environment, Forest & Climate Change. Eastern Regional Office, A/3, Chandrasekharapur, Bhubaneswar-751023
2. Member Secretary, State Pollution Control Board, Odisha, Paribesh Bhawan, Nilakantha Nagar, A/118, Unit -8, Bhubaneswar-751012
3. Regional Office, State Pollution Control Board, Odisha, Plot No- 370/5971, At- Babubagicha, (Cox Colony) St. Merry Hospital Road, Po- Industrial Estate, Dist- Jharsuguda-768203
4. The In charge, Eastern Zonal Office, Central Pollution Control Board, Southernd Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107 (W. B.)

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MoEF EC COMPLIANCE REPORT (OCT 16-MAR 17)



Clause No.	Environmental Clearance Conditions	OPGC II Compliance Status
4. (i)	It shall be ensured that natural drainage in the area is not disturbed due to any activity associated with operation or development of the power plant.	<ul style="list-style-type: none"> Natural drainage in the project area is not being disturbed and will not be done in future.
4. (ii)	The height of the existing ash pond shall not be increased to accommodate fresh disposal of ash slurry.	<ul style="list-style-type: none"> The height of existing ash pond will not be increased to accommodate fresh disposal of ash slurry from the subject project (unit 3 & 4). Separate site has been identified for disposal of ash from Unit 3&4. The ash pond will be constructed in Tilia village which is located 14 km away from the plant site.
4.(iii)	Wildlife conservation plan prepared in consultation with the office of the concerned Chief Wildlife Warden shall be implemented before any expansion activity is undertaken. The status of implementation shall be submitted to the Regional Office of the Ministry within six months and from time to time.	<ul style="list-style-type: none"> The Site Specific Wild Life Conservation Plan (SSWLCP) for the power plant got approved by PCCF (WL)/ CWLW, Odisha on 12th June, 2014. The payment for execution of SSWLCP was done on 18.07.2012 to Odisha CAMPA account. Receipt submitted as annexure previous EC compliance report dated 10th Dec, 2014. Special drive initiated for green belt development. Identification of site from green belt development within the premises done. Plantation of 8200 number of saplings done for the year 2016-17.
4. (iv)	Hydro-geological study of the area shall be reviewed annually and results submitted to the Ministry and concerned agency in the State Govt. In case adverse impact on ground water quantity and quality is observed, immediate mitigating steps to contain any adverse impact on ground water shall be undertaken.	<ul style="list-style-type: none"> Hydro-geological study of the Ash Pond and nearby areas was studied by SGS India Pvt Ltd during April 2014. The comparison of the ground water samples near the existing ash pond & nearby surrounding villages' shows that the concentration of heavy metals is within the permissible limits of IS standard 10500 and WHO permissible limits. The ground water reservoir is substantial in the area. The report was submitted before State Pollution Control Board, Odisha. This study shall be conducted on annual basis covering plant area & results shall be submitted before the regional office & SPCB. Report submitted as annexure previous EC compliance report dated 10th Dec, 2014. Review studies has been conducted by IIT Chennai for ensuring the quality of ground water and surface water for the years 2015 & 2016. Annexure 1a. For 2017, we have initiated action to carry out a more comprehensive hydro geological study through an MOEF authorised consultant.

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Clause No.	Environmental Clearance Conditions	OPGC II Compliance Status
		<ul style="list-style-type: none"> Piezometers have been installed in existing ash pond and periodic monitoring is being taking place. Order has been placed for additional 6 nos. of bore wells. Hydrogeological study to initiate after completion of bore wells. Target for completion of hydrogeological study covering all three seasons-March 2018. Annexure 1 b & 1 c.
4. (v)	A twin flue stack of 275 m height shall be provided with continuous online monitoring equipment's for SO _x , NO _x and RSPM (PM _{2.5} & PM ₁₀). Exit velocity of flue gases shall not be less than 22 m/sec. Mercury emissions from stack shall also be monitored on periodic basis.	<ul style="list-style-type: none"> The design requirements have already been incorporated in the plant design specifications. Mercury emission if any will be monitored periodically on commissioning of the Plant. Application for this done on 01.12.2015 via letter no 3534 and application is attached as Annexure-2.
4. (vi)	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm ³ .	<ul style="list-style-type: none"> The ESP is designed with all fields in service at BMCR WC firing. The selected ESP is guaranteed for an outlet emission of 50 mg/Mm³ at 100% BMCR worst coal firing condition with collection efficiency of ESP at 99.938%. There are 4 electrostatic precipitators of size FAA - 10 X 45M - 2 X 116150 - 2 per boiler. Each ESP is provided with 4 hoppers arrangement across the flow directions. Each ESP is provided with 40 numbers of hoppers. These ash hoppers are located directly beneath the fields and receive the fly ash dislodged from the collecting electrode and emitting system.
4. (vii)	Adequate dust extraction system such as cyclones/ bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	<ul style="list-style-type: none"> The design requirements have already been incorporated in the plant design specifications.
4. (viii)	Utilisation of 100% Ash generated shall be made from 4th year of operation of the plant. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.	<ul style="list-style-type: none"> Ash Management plan furnished as Annexure -3.
4. (ix)	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized fly ash shall be disposed of in the ash pond in the form of slurry form. Mercury and other heavy metals (As, Hg, Cr, and Pb etc.) will be monitored in the bottom ash as also in the effluents	<ul style="list-style-type: none"> The design requirements have already been incorporated in the plant design specifications. Effluent emanating from the existing ash pond is being recycled and reused for fresh slurry making. No ash pond effluent is being discharged outside. The heavy metal in ash

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Clause No.	Environmental Clearance Conditions	OPGC II Compliance Status
	emanating from the existing ash pond. No ash shall be disposed of in low lying area.	and nearby ground water being monitored periodically. <ul style="list-style-type: none"> Ash generated from the plant will be disposed only in designated area.
4. (x)	Ash pond shall be lined with HDP/LDP lining or any other suitable impermeable media such that no leachate takes place at any point of time. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached.	<ul style="list-style-type: none"> The design requirements will be incorporated in the design specifications of ash pond. A comparative study of Bentonite clay lining and HDP/LDP lining. Study Report provided showing the various factors in favour of HDPE/ LDPE is attached as Annexure- 4
4. (xi)	For disposal of Bottom Ash in abandoned Manohar mines it shall be ensured that the bottom and sides of the mined out areas are adequately lined with clay before Bottom Ash is filled up. The project proponent shall inform the State Pollution Control Board well in advance before undertaking the activity.	<ul style="list-style-type: none"> The design requirements will be incorporated in the design specifications. State Pollution Control Board will be informed in advance before undertaking filling of mine using ash.
4. (xii)	Closed cycle cooling system with natural draft cooling towers shall be provided. The Effluents shall be treated as per the prescribed norms.	<ul style="list-style-type: none"> Considering the ambient conditions, the plant is being designed with induced draft cooling tower. This deviation request was submitted to Director(Thermal), MoEF vide letter No.565 dated 8 -March-2010 Considering our request, MoEF has granted its permission for use of Induced Draft Cooling System via EC Amendment dated 22/01/2014. <p><u>Reason for choosing IDCT over NDCT</u></p> <ul style="list-style-type: none"> Flexibility of O&M (In IDCT partly shut down can done) Cost Effectiveness, Flexible water Loading, Compact design space compared to NDCT Air flow almost constant regardless ambient air temperature RH and wind velocity are one of governing factor for performance of NDCT whereas IDCT is negligible parameter of this. IDCT have air discharge velocity from 3 to 4 times higher than the air entrance velocity thus there is no tendency for a reduced pressure zone to be created at the inlet of air inlet by the action of fans as in case of NDCT. The potential for recirculation on an IDCT is not self-initiating and therefore can be more easily quantified on the basis of ambient wind condition.

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Clause No.	Environmental Clearance Conditions	OPGC II Compliance Status
4. (xiii)	COC 5.0 will be adopted.	<ul style="list-style-type: none"> The design requirements have already been incorporated as COC 6.0 to minimize the water consumption.
4. (xiv)	The treated effluents conforming to the prescribed standards only shall be re-circulated and reused within the plant. There shall be no discharge outside the plant boundary except during monsoon. Arrangements shall be made that effluents and storm water do not get mixed.	<ul style="list-style-type: none"> The design requirements have already been incorporated in the plant design specifications. Reusability of effluent water accounted in the Water Balance Diagram. The diagram is attached as Annexure-5
4. (xv)	A sewage treatment plant shall be provided and the treated sewage shall be used for raising greenbelt/plantation.	<ul style="list-style-type: none"> Sewage will be treated in existing sewage treatment plant. Treated sewage will be used for raising greenbelt/plantation. Now the existing 1 MLD sewage treatment plant is operating at 22 % load. With the proposed expansion activity additional 24% load will be added and it is conveniently accommodated in the existing STP capacity.
4. (xvi)	Rainwater harvesting should be adopted. Central Groundwater Authority/ Board shall be consulted for finalization of appropriate rainwater harvesting technology within a period of three months from the date of clearance and details shall be furnished.	<ul style="list-style-type: none"> The detail study on rain water harvesting technology has already been completed in May-2012 and the report is already finalised. The same was submitted to Central Ground Water Board for review and advice vide letter No. 1612/WE dated 28-June 13. CGWB authority via letter no. 613 dated 06/07/2013 has asked to comply on certain points. The compliance report submitted vide letter no 580 with enclosure on 17.02.2014. OPGC has resubmitted the RHW & AR report for approval to Regional Office, CGWB on 16.02.2017. Final Approval letter is awaited. <p>Annexure -6</p>
4. (xvii)	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with location plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.	<ul style="list-style-type: none"> The design requirements have already been incorporated in the plant design specifications. Details of Fire protection arrangement at coal yard is attached as Annexure -7
4. (xviii)	Storage facilities for auxiliary liquid fuel such as LDO and/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of	<ul style="list-style-type: none"> Storage Facilities for auxiliary liquid fuel shall be made in consultation with Dept. of Explosive. As regards to Sulphur content, EAC (Thermal) in its monthly meeting held on 18th/19th November 2013 has accorded its consent for the use of commercially available fuel oil.

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Clause No.	Environmental Clearance Conditions	OPGC II Compliance Status
	an accident taking place due to storage of oil.	<ul style="list-style-type: none"> Disaster management plan shall be prepared before going for storage and handling of the oil.
4. (xix)	Regular monitoring of ground water (especially around ash pond and plant areas) shall be carried out by establishing a network of existing wells and constructing new piezometers. Monitoring around the ash pond area shall be carried out particularly for heavy metals (Hg, Cr, As, Pb) and records maintained and submitted to the Regional Office of this Ministry. The data so obtained should be compared with the baseline data so as to ensure that the ground water quality is not adversely affected due to the project.	<ul style="list-style-type: none"> Hydro-geological study of the Ash Pond and nearby areas was studied by SGS India Pvt Ltd during April 2014. The comparison of the ground water samples near the existing ash pond & nearby surrounding villages' shows that the concentration of heavy metals is within the permissible limits of IS standard 10500 and WHO permissible limits. In 2015, a review study has been conducted by IIT Madras for ensuring the quality of ground water and surface water. Report submitted earlier. Geotechnical Department, IIT, Madras has conducted a preliminary survey to decide the locations of sampling wells and piezometers inside plant and around ash ponds. Piezometers have been installed in existing ash pond and periodic monitoring is being For 2017, we have initiated action to carry out a more comprehensive hydro geological study through an MOEF authorised consultant under the supervision and guidance of team from IIT Madras. Order has been placed for additional 6 nos. of bore wells. Hydrogeological study to initiate after completion of bore wells. Target is end of June, 2017.
4. (xx)	Monitoring surface water quantity and quality shall also be regularly conducted and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall be undertaken.	<ul style="list-style-type: none"> Surface water and ground water quality monitoring is being done regularly. Once the Hydro geological study is completed, the points for monitoring in the direction of flow of ground water will be decided and monitoring will be done regularly.
4. (xxi)	Green Belt consisting of 3 tiers of plantations of native species around plant and at least 100 m width shall be raised. Wherever 100 m width is not feasible a 50 m width shall be raised and adequate justification shall be submitted to the Ministry. Tree density shall not less than 2500 per ha with survival rate not less than 70 %.	<ul style="list-style-type: none"> The requirements are addressed in the drawing number D-56 (already submitted on 30th November 2011). Now existing green cover is 34% of the plant area. This year, we have identified some of the vacant areas and some of thin green covers within the plant premises for augment our green cover.

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		<ul style="list-style-type: none"> We have made a year wise plan for carrying out plantation. As stated earlier, we have completed 8200 number tree plantation in 2016-17. 15000 saplings were distributed in the peripheral villages. Target for 2017-18 is 7000 plantation & 10000 sapling distribution.
4. (xxii)	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	<ul style="list-style-type: none"> Well-equipped first aid/sanitation facility is being provided at the project site.
4. (xxiii)	Noise levels emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 75 dBA. For people working in the high noise area, requisite personal protective equipment like earplugs/ear muffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non-noisy/less noisy areas.	<ul style="list-style-type: none"> The design requirements for control of noise in the work areas have already been incorporated in the plant design specifications. PPE is being provided in OPGC for all personnel exposed to work in noisy area. Periodic health check has already been implemented in OPGC.
4. (xxiv)	Regular monitoring of ground level concentration of SO ₂ , NO _x , RSPM (PM _{2.5} & PM ₁₀) and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.	<ul style="list-style-type: none"> In OPGC ground level concentrations are being monitored at six locations as agreed with SPCB and monthly periodic reports are submitted to SPCB. Ambient air is also being monitored on continuous basis by four online ambient air monitoring station & result of analysis are transmitted to SPCB server on real time basis. Periodic reports are being submitted to the Regional Office of MoEF.
4. (xxv)	A good action plan for R&R (if applicable) with package for the project affected persons be submitted and implemented as per prevalent R&R policy within three months from the date of issue of this letter.	<ul style="list-style-type: none"> R & R plan is not required as there is no displacement of people due to OPGC Unit 3&4.
4. (xxvi)	An amount of Rs 24.36 Crores shall be earmarked as one time capital cost for CSR programme. Subsequently a recurring expenditure of Rs 4.87 Crores per annum shall be earmarked as recurring expenditure for CSR activities. Details of	<ul style="list-style-type: none"> Need based assessment have been conducted by CSR team of OPGC which was followed by a Baseline Survey taken up by a professional agency. The project list of Rs. 25.42 Crores provides the details of projects to be undertaken for development of local

Clause No.	Environmental Clearance Conditions	OPGC II Compliance Status
	the activities to be undertaken shall be submitted within one month along with road map for implementation.	people. The list may be modified in future if beneficiaries wish to implement any other project by replacing any one or few of the already approved projects. Annexure-8
4. (xxvii)	As part of CSR programme the company shall conduct need based assessment for the nearby villages 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 besides development of fodder farm, fruit bearing orchards, vocational training etc. can form a part of such programme. Company shall provide separate budget for community' development activities and income generating programmes. This will be in addition to vocational training for individuals imparted to take up self employment and jobs.	<ul style="list-style-type: none"> This is high on OPGC's agenda. The approved project list throws adequate light on how OPGC has planned elaborately to provide lasting and sustainable water solutions to people of nearby villages. A scientific Hydrology Study was executed to guide the process of project implementation. OPGC has also started mobilising peoples' opinion and support for sustainable water solutions in collaboration with experts and Jharsuguda district authorities.
4. (xxviii)	The project proponent shall also adequately contribute in the development of the neighbouring villages. Special package with implementation schedule for providing fluoride free potable drinking water supply in the nearby villages and schools shall be undertaken in a time bound manner.	<ul style="list-style-type: none"> Need based assessment have been conducted by CSR team of OPGC which was followed by a Baseline Survey taken up by a professional agency. The project list of Rs. 25.42 Crores provides the details of projects to be undertaken for development of local people. The list may be modified in future if beneficiaries wish to implement any other project by replacing any one or few of the already approved projects.
4. (xxix)	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	<ul style="list-style-type: none"> Adequate space for construction of labour colony has already been earmarked outside the plant boundary. Infrastructure for provision of water supply and electricity has already been made. Other infrastructural requirement is being provided by the construction contractor.
4. (xxx)	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in .	<ul style="list-style-type: none"> Complied. Published in Sambad (Odiya) & New India Express (English) in March 2010.

Clause No.	Environmental Clearance Conditions	OPGC II Compliance Status
4. (xxxī)	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, ZilaParisad / Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/representations, if any, received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	<ul style="list-style-type: none"> Complied in March 2010.
4. (xxxīī)	A separate Environment Management Cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards.	<ul style="list-style-type: none"> A separate Environment Management Cell with qualified staff has already been functioning for the purpose.
4. (xxxīīī)	The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely, RSPM, 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.	<ul style="list-style-type: none"> The status of compliance is being uploaded in Website and reports are also being sent to the said offices.
4. (xxxīīv)	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well by e-mail) to the respective Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB.	<ul style="list-style-type: none"> Reporting already commenced since October 2010.
4. (xxxīv)	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 EC conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.	<ul style="list-style-type: none"> Form V submission and web-hosting will be commenced on commissioning of Plant.
4. (xxxīvi)	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	<ul style="list-style-type: none"> Reporting already commenced since October 2010. The compliance report is being sent to Ministry of Environment and Forests, its Regional Office, Central Pollution Control

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	Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same bye-mail to the Regional Office, Ministry of Environment and Forests.	<ul style="list-style-type: none"> Board, State Pollution Control Board and the Regional Office, OSPCB. Web hosting of EC Compliance status is being done.
4. (xxxvii)	Regional Office of the Ministry of Environment & Forests will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring. Project proponent will upload the compliance status in their website and up-date the same from time to time at least six monthly bases. Criteria pollutants levels including NO _x (from stack & ambient air) shall be displayed at the main gate of the power plant.	<ul style="list-style-type: none"> Reporting already commenced since October 2010. Web-hosting of compliance of stipulated in the EC conditions being done. Criteria pollutants levels NO_x (from stack & ambient air) will be displayed at the main gate of the power plant on commissioning of Plant.
4. (xxxviii)	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.	<ul style="list-style-type: none"> The project cost includes the provision for implementation of environmental protection measures as required.
4. (xxxix)	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant.	<ul style="list-style-type: none"> The financial closure of the project was done on 23rd November, 2012. NTP was issued to BHEL and BGRE on 26th March, 2014.
4. (xxxx)	Full cooperation shall be extended to the Scientists/Officers from the Ministry / Regional Office of the Ministry at Bangalore / CPCB/ SPCB who would be monitoring the compliance of environmental status.	<ul style="list-style-type: none"> It is being done.

Additional Recommendations to OPGCL by MoEF in EC amendment dated 22.01.2014

S. No	Recommendations	Compliance status
a	A long term study of radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter, mechanism for an inbuilt continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	<ul style="list-style-type: none"> The study shall be conducted once the source of the coal to be used will be defined.
b	Continuous monitoring for heavy metals in and around the existing ash pond area shall be immediately carried out by reputed institutes like IIT Kanpur.	<ul style="list-style-type: none"> The monitoring has been periodically carried out through reputed and accredited agency M/S SGS India Ltd. The same monitoring shall be carried out through IIT, Madras.
c	Harnessing solar power within the premises of the plant particularly at available roof tops shall be undertaken and status of implementation shall be submitted periodically to the Regional Office of the Ministry.	<ul style="list-style-type: none"> Shall be complied.
d	Fugitive emissions shall be controlled to prevent impact on agricultural or non-agricultural land.	<ul style="list-style-type: none"> Adequate dust suppression measures like water sprinkling is being done at the construction site. However sufficient sprinklers will be installed to suppress fugitive dust from vehicular movement and coal handling area.
e	No ground water shall be extracted for use in operation of the power plant even in lean season.	<ul style="list-style-type: none"> Ground water is not being used.
f	Minimum required environmental flow suggested by the Competent Authority of the State Govt. shall be maintained in the Channel/ Rivers (as applicable) even in lean season.	<ul style="list-style-type: none"> Minimum required environmental flow is being maintained as per the water agreement with Water Resource Department.
g	No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up/operation of the power plant.	<ul style="list-style-type: none"> No water bodies are being disturbed due to project or will be disturbed due to operation.
h	Fly ash shall not be used for agricultural purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, prior detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the State Pollution Control Board and implementation done in close co-ordination with the State Pollution Control Board.	<ul style="list-style-type: none"> Ash Management plan to be furnished is attached as Annexure – 3.

MoEF EC COMPLIANCE REPORT (OCT 16-MAR 17)

Additional Recommendations to OPGCL by MoEF in EC amendment dated 22.01.2014		
S. No	Recommendations	Compliance status
i	Three tier green belts shall be developed all around Ash Pond over and above the Green Belt around the plant boundary.	<ul style="list-style-type: none"> Green belt already exists all along the plant boundary. For Ash Pond, SPCB Odisha advised not to go for any plantation on the ash pond dykes looking towards the risk of dyke failure due to tree root channelling. However, OPGC will re-examine the risk involved through and expert agency and do the needful in consultation with Regional office MoEF and SPCB.
j	A common Green Endowment Fund shall be created and the interest earned out of it shall be used for the development and management of green cover of the area.	<ul style="list-style-type: none"> Shall be complied.
k	It shall be ensured that in-built monitoring mechanism for the schemes identified is in place and annual social audit shall be got done from the nearest government institute of repute in the region. The project proponent shall also submit the status of implementation of the scheme from time to time.	<ul style="list-style-type: none"> Baseline Survey has been completed by Sutra Consultancy Services, Bhubaneswar and the Final Report is already available with OPGC. Projects are currently under execution and appropriate time to get them evaluated by an external agency is not yet ripe. Impact measurement will be done in due course. An internal monitoring mechanism is already in place. As recommended, a proposal will be put up before OPGC Board of Directors to consider getting social audit conducted once all the approved projects have been successfully executed. It is pertinent to mention that social audit is an integral part of measurement of impact.
l	An Environmental Cell shall be created at the project site itself and shall be headed by an officer of the company of appropriate seniority and qualification. It shall be ensured that the head of the Cell shall directly report to the Head of the Organization.	<ul style="list-style-type: none"> A separate Environment Management Cell with qualified staff has already been functioning for the purpose.
m	The project proponent shall formulate a well laid Corporate Environment Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.	<ul style="list-style-type: none"> OPGC has got well formulated Corporate EHS Policy and it is annexed as Annexure -9.



DEPARTMENT OF CIVIL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY MADRAS

Chennai, India 600036

Tel No. (044) 2257-4297

FAX: (044) 2257-4252

E-mail: arnepalli@iitm.ac.in

<http://www.civil.iitm.ac.in>

9th February 2017

To
Mr. Umakanta Pahi
EHS, IB Thermal Power Station
Banaharpali, Jharsuguda
Odisha-768324, India

Dear Sir,

Subject: Chemical Analysis of water samples reg.

With reference to the above we have analyzed water samples provided by you on 12/12/2016, for their chemical properties. The results obtained from various chemical analyses are presented in the following (table 1). Please let us know if you need any further clarification.

Thanking you

Yours sincerely,

डॉ. दालि नायडु अर्नेपल्लि/Dr. D. N. Arnepalli

सह प्राध्यापक/Associate Professor

सिविल इंजीनियरिंग विभाग

Department of Civil Engineering

भारतीय प्रौद्योगिकी संस्थान मद्रास

Indian Institute of Technology Madras


चेन्नै-६०० ०३६, भारत/Chennai-600 036, India.

Table 1. Chemical Analyses of OPGC water samples (Batch:1 Provided on 12/12/2016)

S. No.	Sample ID	pH	EC ($\mu\text{S}/\text{cm}$)	Concentration of element (ppm)						
				Cd	Cu	Fe	Mn	Pb	Sr	Hg
1	Water of pond ash-A	7.2	329.7	0.007	0.002	---	0.059	0.065	---	---
2	Reservoir water adjacent to ash pond-A	7.8	170.8	0.002	---	---	---	0.028	---	---
3	Reservoir water adjacent to ash pond-B	7.7	149.8	0.001	0.008	---	---	0.070	---	---
4	Rengali open well	6.5	337.4	0.003	0.001	---	---	0.062	---	---
5	Kantatikra open well	6.7	490.5	0.012	0.012	---	---	0.042	---	---
6	Kantatikra tube well	7.5	1646.0	0.003	0.003	---	0.010	0.058	4.050	---
7	Budapalli tube well	7.1	318.0	0.005	0.013	0.235	---	0.01	---	---
8	OPGC combined effluent	7.8	301.8	0.009	0.009	0.706	0.011	0.029	---	---
9	Baragarh tube well	8.1	733.6	0.002	0.009	---	---	0.028	1.080	---
10	Sargipalli tube well	7.6	659.9	0.012	0.019	---	0.012	0.125	1.110	---
11	Rengali tube well	7.5	610.7	0.009	0.014	---	0.008	0.059	1.780	---

--- Below the detection level of the instrument ($< 0.001\text{ppm}$)

* Each concentration is the average of the results obtained from six independent analyses


 डॉ. दलित नायडु अर्नेपल्लि / Dr. D. N. Arnepalli
 सह प्राध्यापक / Associate Professor
 सिविल इंजीनियरिंग विभाग
 Department of Civil Engineering
 भारतीय प्रौद्योगिकी संस्थान मद्रास
 Indian Institute of Technology Madras
 चेन्नै-६०० ०३६, भारत / Chennai-600 036, India.

ODISHA POWER GENERATION CORPORATION LIMITED

(A Government Company of the State of Odisha)

CIN NO - U40104OR1984SGC001429

IB THERMAL POWER STATION

AT/PO-BANHARPALI, JHARSUGUDA, ODISHA, INDIA, PIN CODE-768234



ANNEXURE - 1b

Printed on: 14.02.2017 at 9:43:28 AM Total Page: 6	BANKER'S NAME: IFSC Andhra Bank 0662 State Bank of India 9510 Central Bank of India 3899 ICICI 3679	PAN: AAAC04759R CST: 21771700082(C) TIN: 21771700082 GST: 21771700082 Service Tax :-AAAC04759RSD002	Tel +91-6645-289-317 Tel/Fax +91-6645-289-317 Email contract@opgc.co.in/ purchase@opgc.co.in
--	---	---	---

PROJECT PURCHASE ORDER

SERVICE ORDER No : 3500000616

Rel Dt. : 14.02.2017

To : Vision Tek Consultancy Services Pvt, Contact Person: , Plot No 1 08 District Center Chandrasekha, Bhubaneswar Odisha-751023 Phone :06746600800 Fax :6742744594 Email :visiontekin@gmail.com VAT/TIN/GST : CST(TIN)No : Service Tax :AABCV8957DST001 PAN :AABCV8957D	Ship To: Odisha Power Generation Corporation Limited IB Thermal Power Station AT/PO:Banaharpali Jharsuguda-768234 Odisha,India PO Value :862,500.00 Currency :INR	PR Nos: 3100000046 Tend Enq No: Dt: Vend Qt No.: Dt: Vendor Code.: 1001958 Buyer's Name :Debesh Mohanty Contact No : Email : Buyer Dept : Contract Cell File No.
--	--	--

References:

Name of work: "Hydrogeological Study of Ash Pond Area & Plant Area at IB Thermal Power Station, Banaharpali, Jharsuguda, Odisha

Ref: (1) Our NIT No: ITPS/Unit3&4/2016-17/081, dated 15/11/2016

S.No	Service Description	Unit	Amount	Tax	Total Amount	Comp. Date
10	Hydrogeological Study	AU	750,000.00	112,500.00	862,500.00	10.02.2020

PO Basic Value: 750,000.00 Addl TCD Charge: 112,500.00 & Total PO Value: 862,500.00

IN WORDS : EIGHT LAKH SIXTY TWO THOUSAND FIVE HUNDRED RUPEES ONLY

Enclosures:

Accepted with all terms & conditions

For OPGC Ltd.

AUTHORISED SIGNATORY

VENDOR ACCEPTANCE (SIGNATURE & STAMP)

ODISHA POWER GENERATION CORPORATION LIMITED

(A Government Company of the State of Odisha)

CIN NO - U40104OR1984SGC001429

IB THERMAL POWER STATION



SERVICE ORDER No : 3500000616

Scope Of Work:

Scope Of Work

Hydrogeological Study of Ash Pond Area & Plant Area at IB Thermal Power Station, Banahrapali, Jharsuguda, Odisha

The scope of the hydrogeological study at IB thermal Power station will cover the following.

Study Area- OPGC existing Ash Ponds & Plant Site (both operational and construction sites)

Study Period- schedule will be Pre-monsoon, monsoon and post monsoon or from date of commencement to be confirmed by EIC. Initial detailed comprehensive study (1st year) and yearly review for subsequent two years.

A. 1st Year Study

1. Using the topography data, contour maps of the study area and meteorological data, estimate catchment area which potentially contributes to the surface runoff. Verify the adequacy of existing drainage pattern of surface runoff.
2. Study of topography, drainage in core and buffer zone (10 km radius).
3. Collection and analysis of available meteorological, geological, hydrogeological and demographic data and land uses/crop pattern data.
4. Study of regional geology and geology of study area cross sections and mapping.
5. Study of surface satellite imagery for land use pattern in study area.
6. Establish the ground water potentiometric elevations using available boreholes/wells in and around the sites. The agency will bring portable piezometer and other required Instrument to measure this parameter.
7. Identification of aquifers and their thickness.
8. Establish the subsurface layer(s) informations
9. Using the subsurface layers information and potentiometric elevations, the ground water level contours will be developed. Using these information, find the direction of ground water flow and its variation throughout the years of the phreatic aquifer and probable discharge and recharge zones.
10. Conducting infiltration tests.
11. Conducting pumping at site.
12. Conducting APT (Aquifer performance test) in each pumping well.
13. Collection of historical water level data and water level trend analysis.
14. Sampling and monitoring of the ground water quality and surface water quality, its chemical composition w.r.t pH; Electrical Conductivity, TDS, Alkalinity, Na, Ca, Mg, K, SO4²⁻, F⁻, As, Pb, Hg, and other heavy metals###
15. Minimum ten water samples and five soil samples testing
16. Based on all the above data, the contaminant impact on ground water as well as on reservoir water will be assessed
17. Preparation of a comprehensive hydrogeological report as per the guidelines of Ministry of Environment Forest and Climatic Change (MoEF & CC), Government of India.

B. Post study yearly monitoring & review

1. Study of Ground Water periodically (pre & post monsoon and during monsoon) from available Bore wells.
2. Ground & Surface Water sampling and analysis as per guideline of MoEF& CC.
3. Impact on Ground Water due to the existing Project, Operating Plant & Ash Pond
4. Preparation and Submission of report.

Note-Before final approval of the draft study reports prepared by the agency, OPGC may review the study report through IIT Madras for its adequacy and authenticity. The agency will have to address the comments given by OPGC/IIT Madras as appropriate during the review of the draft report.

Offer to be submitted separately for Initial (1st year comprehensive study) and post study yearly review in the below format.

Terms & Conditions of Contract:

1. Contract Price:

The Contract price for the above scope of work mentioned in BOQ stands at Rs.7,50,000/- (Rupee Seven Lakhs fifty Thousand rupees only). The rates shall be firm during the contract period and inclusive of all applicable taxes, duties, levies, etc. except service tax which shall be paid extra as per actual. However, payment shall be made as per actual engagement or any fraction thereof in proportionate basis duly certified by the EIC.

2. Contract Period:

The time period of work order will be 3 (three) years from the date of commencement of work. Date of Commencement will be confirmed by EIC. All other terms and condition will be as per NIT.

3. Taxes & duties and Statutory Deductions:

Income tax and any other taxes, duties & levies and statutory dues as applicable shall be deducted from your bills at the rate ruling at the time of payment of bills.

4. Submission of bill:

Bills in triplicate along with the Service Tax A/C Code for the measured work shall be submitted to Engineer-In-charge for verification after completion of work. The bills shall be prepared & raised as per Rule 4(A) 1 of the Service Tax Rules showing-

Regd Office :Zone-4,Module C/2,7th Floor,Fortune Towers,Chandrasekharpur,Bhubaneswar-751023,Odisha,Ph 0674-2303765/66,Fax 0674-2303765/6 website: www.opgc.co.in

ODISHA POWER GENERATION CORPORATION LIMITED

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- a) Name, address & registration number of such service provider
- b) Name, address of the person receiving taxable service
- c) Description, classification & value of taxable service provided
- d) Service tax payable thereon.

5. Payment of bill:

Payment after statutory deductions and other deductions like applicable taxes, duties, levies etc. shall be released against submission of bills duly certified by the Engineer-in-charge. The payment shall be made through e-mode facilities of RTGS / NEFT / Internet Banking. To facilitate the E-payment you shall return the enclosed Bank Mandate Form duly filled, along with the duplicate copy of the Work Order. payment will be done on following basis:

1st Year Study- 1. 20% against submission of Reconnaissance Survey report, 40% after submission of draft report and rest 40% after submission of final report and acceptance by OPGC EIC

2nd Year- 100% after submission of 2nd year final review report and acceptance by OPGC EIC

3rd Year- 100% after submission of 3rd year final review report and acceptance by OPGC EIC

6. Works Programme/Quality Assurance Plan /Safety Plan:

Before starting the work, you shall submit detailed works programme, milestone of different activities, safety and quality assurance plan of the work to the Engineer-in-charge for his approval after which work shall be started as per the approved programme. Any other documents required by the Engineer-in-charge for the above work shall be submitted.

7. Measurement of work:

The work shall be inspected / measured as directed by the Engineer-in-charge and entered in the measurement book with signatures of both contractor and Engineer-in-charge or their authorized representatives as a token of mutual acceptance.

8. Permit to Work:

Before the start of each work, you shall ensure that a valid and duly signed Permit to Work has been Issued. Also, you shall ensure the issue of valid and duly signed Confined Space permit and Hot Work Permit if the same is required as per OPGC rule. All the permits shall be returned to the concerned Engineer after completion of the job.

9.0 Penalty:

In case of non-performance / continuous poor performance, the contract shall be terminated with 07(seven) days' notice and the work shall be done by any other means at your cost and risk till engagement of other agency. If the price of contract for the balance work shall be higher, the additional amount shall be recovered from the security or any dues of the contract or any other contract taken by you in OPGC.

10. Termination of contract:

a) In case of failure to start the work within due date, OPGC reserves the right to terminate the contract without reference to you.

b) If the quality of the work is found to be unsatisfactory, the contract shall be terminated with immediate notice and the security deposit shall be forfeited.

11. Subletting:

The work shall not in any manner or degree be sublet. The work shall be executed under the direct supervision of the supervisors of your firm.

12. Indemnity:

You shall keep OPGC indemnified from all liabilities resulting out of this contract and act of your workmen.

13. Offloading of job:

In case it is observed during the tenure of the contract that you are not capable or in a position to complete the job, OPGC reserves the right to offload the same and get it done through other agencies at your cost and risk.

14. Employees Provident Fund:

You shall declare that Provident Fund amount for the people engaged by you has been deposited as per rule.

15. Safety, Health, Environment and Quality:

a) Your service personnel shall abide by all safety norms of OPGC as per enclosure and obtain safety induction training from OPGC Safety Officer before starting the work. Any violation in the safety rules shall be viewed seriously and you shall be penalized as per OPGC Safety Rules.

b) You shall ensure the medical fitness of your service personnel before start of work.

c) You shall submit Safety Plan of the work to the Engineer-in-charge before start of the work.

d) While driving two wheelers inside the plant boundary Crash Helmet to be used positively. Violation of this rule will attract penalty.

16. Engineer-In-Charge (EIC):

Head-EHS, ITPS or his authorized representative is the Engineer-In-charge

ODISHA POWER GENERATION CORPORATION LIMITED

(A Government Company of the State of Odisha)

CIN NO - U40104OR1984SGC001429

IB THERMAL POWER STATION



17. Paying Officer:

DGM - Finance - ITPS is the Paying Officer.

18. Dispute settlement:

Any dispute or difference arising out of this contract shall be mutually settled and the decision of the Managing Director, OPGC or his authorized representative shall be final & binding.

19. Jurisdiction:

Appropriate Court at Bhubaneswar under the Odisha High Court shall have exclusive jurisdiction over all matters related to this contract.

All other terms and conditions not specifically stated in the foregoing clauses shall be as per tender documents and shall form a part of the Work Order.

You are requested to acknowledge receipt of this Work order and return us the enclosed duplicate copy duly signed on each page as a token of your unconditional acceptance and acknowledgement. In case we do not receive the signed duplicate copy within 07(seven) day it will be treated that you have accepted this work order in its entirety.

Special Terms & Conditions:

NAME OF WORK: Hydrogeological Study of Ash Pond Area & Plant Area at IB Thermal Power Station, Banahrapali, Jharsuguda, Odisha

Special Conditions:

1. Before final approval of the draft study reports prepared by the agency, OPGC may review the study report through IIT Madras for its adequacy and authenticity. The agency will have to address the comments given by OPGC/IIT Madras as appropriate during the review of the draft report. Besides, during the course of the study if any suggestion or recommendation comes from the IIT, the agency has to consider/include within the scope.
2. Party has to start the study at site within 15 days from the receipt of confirmed order data or as per the clearance given by the officer in charge of OPGC
3. While working within ITPS premises during the study period, people engaged by the agency must follow OPGC SHE rules and regulatory and Statutory rules as applicable to the task failing which disciplinary action as deemed fit will be taken by OPGC.
4. 1st year draft study report will be submitted to OPGC OIC within fifteen days from the date of completing all field tests.
5. Final study report shall be submitted in five hard copies and in editable e- file after consideration of OPGC and IIT comments.
6. Offer to be submitted separately for Initial (1st year comprehensive study) and post study yearly review.
7. Offer shall be submitted in two bid system i.e technical & commercial. Parties found qualified in the technical bid will only qualify for participating in commercial bid competition.

Accommodation: On availability and chargeable basis at OPGC guest house.

Terms of Payment:

Payment Term:

Break-up of the price will be as follows:

1. First Year Comprehensive Study cost as per the scope -Rs.500000/-
 2. Post study 1st year review and monitoring cost as per the scope- Rs.125000/-
 3. Post Study 2nd year review and monitoring cost as per the scope-Rs.125000/-
- Service tax extra as applicable

1st Year Study- 1. 20% against submission of Reconnaissance Survey report., 40% after submission of draft report and rest 40% after submission of final report and acceptance by OPGC OIC

2nd Year- 100% after submission of 2nd year final review report and acceptance by OPGC OIC

3rd Year- 100% after submission of 3rd year final review report and acceptance by OPGC OIC

ODISHA POWER GENERATION CORPORATION LIMITED

(A Government Company of the State of Odisha)

CIN NO - U40104OR1984SGC001429

IB THERMAL POWER STATION



SERVICE ORDER No : 3500000616

Price Schedule

Item	Service Short Text	Qty.	UoM	Rate	Taxes/Overheads	Amount
10	Hydrogeological Study	1	AU	750,000.00	Basic Price : Service Tax : Total	750,000.00 112,500.00 862,500.00

Hydrogeological study for Ash pond (OPGC - I) and Main Plant. Reputed agencies who carries out such studies are;

1. SGS India Pvt. Ltd. Chennai
2. Bhagavathi Ana Labs Ltd, Hyderabad.
3. Geomarine Consultants (P) Ltd., Chennai
4. Visiontek Consultancy Services Pvt. Ltd. BBSR
5. ERM India Pvt. Ltd., Gurgaon
6. Anacon Laboratories Pvt. Ltd., Nagpur

Scope of Work

Hydrogeological Study of Ash Pond & Plant Area at IB Thermal Power Station, Banahrapali, Jharsuguda, Odisha

The scope of the hydrogeological study at IB thermal Power station will cover the following.

Study Area- OPGC existing Ash Ponds & Plant Site (both operational and construction sites)

Study Period- Pre-monsoon, monsoon and post monsoon. Initial detailed comprehensive study (1st year) and yearly review for subsequent two years.

A. 1st Year Study

1. Using the topography data, contour maps of the study area and meteorological data, estimate catchment area which potentially contributes to the surface runoff. Verify the adequacy of existing drainage pattern of surface runoff.
2. Study of topography, drainage in core and buffer zone (10 km radius).
3. Collection and analysis of available meteorological, geological, hydrogeological and demographic data and land uses/crop pattern data
4. Study of regional geology and geology of study area cross sections and mapping.
5. Study of surface satellite imagery for land use pattern in study area.
6. Establish the ground water potentiometric elevations using available boreholes in and around the sites
7. Identification of aquifers and their thickness.
8. Establish the subsurface layer(s) informations
9. Using the subsurface layers information and potentiometric elevations, the ground water level contours will be developed. Using these information, find the direction of ground water flow and its variation throughout the years of the phreatic aquifer and probable discharge or recharge zones.
10. Conducting infiltration tests.
11. Conducting pumping at site.
12. Conducting APT (Aquifer performance test) in each pumping well.
13. Collection of historical water level data and water level trend analysis.
14. Sampling and monitoring of the ground water quality and surface water quality, its chemical composition w.r.t pH; Electrical Conductivity, TDS, Alkalinity, Na, Ca, Mg, K, SO4²⁻, F⁻, As, Pb, Hg, and other heavy metals###
15. Minimum ten water samples and five soil samples testing
16. Based on all the above data, the contaminant impact on ground water as well as on reservoir water will be assessed
17. Preparation of a comprehensive hydrogeological report as per the guidelines of Ministry of Environment Forest and Climatic Change (MoEF & CC), Government of India.

B. Post study yearly monitoring & review

1. Study of Ground Water periodically (pre & post monsoon and during monsoon) from available/installed Borewells.
2. Ground & Surface Water sampling and analysis as per guideline of MoEF.
3. Impact on Ground Water due to the existing Project, Operating Plant & Ash Pond
4. Preparation and Submission of report.

All instruments, sampling equipment etc related to the study will remain under this scope.

Note-Before final approval of the draft study reports prepared by the agency, OPGC may review the study report through IIT Madras for its adequacy and authenticity. The agency will have to address the comments given by OPGC/IIT Madras as appropriate during the review of the draft report. Besides during the course of the study if any suggestion or recommendation comes from the IIT, the agency has to consider/include within the scope.

Offer to be submitted separately for Initial (1st year comprehensive study) and post study yearly review.

Sr. No	Service Description	Quantity	Unit	Price per Unit	Net Value
10	Hydrogeological Study of AshPond & Plant	1.000	AU	750,000.00	750,000.00

ODISHA POWER GENERATION CORPORATION LIMITED

(A Government Company of the State of Odisha)

CIN NO - U40104OR1984SGC001429

IB THERMAL POWER STATION



SERVICE ORDER No : 3500000616

Hydrogeological Study of Ash Pond & Plant Area

Signature
14/2/17

ODISHA POWER GENERATION CORPORATION LIMITED

(A Government Company of the State of Odisha)

CIN NO - U40104OR1984SGC001429

IB THERMAL POWER STATION

AT/PO-BANHARPALI, JHARSUGUDA, ODISHA, INDIA, PIN CODE-768234



ANNEXURE -1C

Printed on: 02-03-2017 at 2:25:34 PM Total Page: 7	BANKER'S NAME: Andhra Bank State Bank of India Central Bank of India ICICI	IFSC 0662 9510 3899 3679	PAN: AAAC04759R CST: 21771700082(C) TIN: 21771700082 GST: 21771700082 Service Tax :-AAAC04759RSD002	Tel +91-6645-289-317 Tel/Fax +91-6645-289-317 Email contract@opgc.co.in/ purchase@opgc.co.in
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PROJECT PURCHASE ORDER

SERVICE ORDER No : 3500000654

Rel Dt. : 02.03.2017

To : Tirupati Enterprises, Contact Person: Arvind Purseth , Coc Colony Near St. Marys School, Jharsuguda Odisha-768201 Phone :9437051506 Fax : Email :tirupati.enterprises.js@gmail.com VAT/TIN/GST : CST(TIN)No : Service Tax :AGZPP3475FSD002 PAN :AGZPP3475F	Ship To: Odisha Power Generation Corporation Limited IB Thermal Power Station AT/PO:Banaharpall Jharsuguda-768234 Odisha,India PO Value :806,448.00 Currency :INR	PR Nos: 3100000329 Tend Enq No: Dt: Vend Qt No.: Dt: Vendor Code.: 2002008 Buyer's Name :Singhal Nishant Kumar Contact No : Email : Buyer Dept : Contract Cell File No.
---	--	---

References:

NIT No: ITPS Unit -3&4 /2016-2017/083 dated 15/11/2016

Name of work: "Water Sampling bore wells for Ground water Monitoring job at IB Thermal Power Station, Banharpali,Jharsuguda "

S.No	Service Description	Unit	Amount	Tax	Total Amount	Comp. Date
10	Water sampling borewells	AU	760,800.00	45,648.00	806,448.00	30.06.2017

PO Basic Value: 760,800.00 Addl TCD Charge: 45,648.00 & Total PO Value: 806,448.00

IN WORDS : EIGHT LAKH SIX THOUSAND FOUR HUNDRED FORTY EIGHT RUPEES ONLY

Enclosures:

Accepted with all terms & conditions

For OPGC Ltd.

AUTHORISED SIGNATORY

VENDOR ACCEPTANCE (SIGNATURE & STAMP)

ODISHA POWER GENERATION CORPORATION LIMITED

(A Government Company of the State of Odisha)

CIN NO - U40104OR1984SGC001429

IB THERMAL POWER STATION



SERVICE ORDER No : 3500000654

Scope Of Work:

The scope of work covers all required activities as per above mentioned NIT, BOQ mentioned in the order and as per the direction of Engineer-in-Charge (EIC) by engaging required manpower & machine for "Water Sampling bore wells for Ground water Monitoring job at IB Thermal Power Station, Banharipali, Jharsuguda "

Technical Specification:

Scope of Work

1.1.1. The scope of work for water sampling bore wells in the demarcated locations as specified by the EIC; involves site cleaning as per requirement, shifting of rigs with all materials tools & tackles, drilling of bore well with all manpower materials, sanitary sealing, washing and development, yield testing, etc. all complete and handling over the same in shape of full-fledged and finished bore well as per the BOQ, technical specification and instruction of EIC.

1.1.2. In course of execution of the work and while shifting the rig from one bore well site to the other in case the road is not approachable the tenderer has to do petty work the cutting, filling up the rain cuts etc. of the approach road at his own cost of make the road leading to the bore well site approachable for the rig. Tenderer should consider this aspect while quoting rates so that no bore well remains incomplete on the plea of inapproachability.

1.1.3. Material to be consumed in the work is to be arranged by the contractor. The rate to be quoted by the tenderer shall be inclusive of all taxes, duties, levies etc. as may be required and no additional information on tax shall be mentioned in the tender documents. The rates to be quoted in words and figures, separately mentioning rupees and paise.

1.1.4. Contractor has to submit MTC for all the construction materials used in the work, and

1.1.5. It would be the responsibility of the contractor for development of bore well and yield testing by compressor through V-notch. It would be the responsibility of the contractor for collection and preservation of soil samples in polythene bags and maintaining a record of the strata encountered at different depth of sampling well with corresponding yield at different levels of drilling as per IS -28 # part (I) 1979.

1.1.6. Minimum length of 1 Meter of casing pipe is to be inserted / embedded in to the hard rock below overburden in each bore well to ensure sanitary sealing.

1.1.7. The contractor shall bear the cost of all incidental charges sundries and contingencies associated with the work.

2.0. Specification:

2.1.1. Labor camps and huts necessary to a suitable scale including conservancy and sanitary arrangements needs to be provided by the contractor at his own cost, as per the OPGC EHS Policy and should satisfy the local health authorities.

2.1.2. The contractor must have all statutory clearances for engagement of laborer and he will abide by the fair wages clause as introduced by the Govt. during execution of the work.

2.1.3. The contractor will have to arrange for water supply for all works and has to arrange adequate lighting arrangements for night whenever necessary at his own cost.

2.1.4. All safety measures shall have to be taken during execution and till date of final completion of work by the contractor at his cost and the rate quoted should be inclusive of all these items.

2.1.5. The contractor will have to submit the monthly return of labor both skilled and unskilled utilized by him on the work.

2.1.6. Suitable fencing, barriers, signals including electrical signals were necessary at works in order to protect the public and employees from accidents shall be provided by the contractor at its own cost.

2.1.7. A site order book shall be kept by the contractor at the work site duly attested by the EIC.

2.1.8. Drilling in hard rock formations will be normally done up to 60 Meter depth provided the minimum yield of 850 lph available from the bore hole. Where the minimum yield is not available within 60 meter the contractor may be required to drill deeper beyond 60 meter up to 80 meter after obtaining the written permission from the Engineer-In-Charge. Payment for failure/ unsuccessful bore shall not be made. It is the discretion of EIC to allow depth observing the yield of the tube well during drilling.

2.1.9. All liabilities arising due to jamming of the bore and breaking of drilling equipment etc. will be borne by the contractor. No extra cost will be payable on this account.

2.1.10. If during any operation carried out for completion of the bore wells any tools, pipes etc. falls down in the bore, the contractor shall carry out the necessary fishing operation at his own cost. He shall use his own equipment for such operation. If the bore well becomes useless due to any falling articles or any other reasons there off it shall be treated as abandoned tube well and no payment shall be made.

2.1.11. It shall be responsible of the contractor to keep the finished bore with or without pump installed for testing over it; protected and guarded from any vandalism till the entire work assigned to him is completed.

2.1.12. In the vent of failure of bore due to less yield; the bore well shall be treated as abandoned and no payment shall be made. The defunct bore well should be closed by filling earth / sand by the contractor to avoid any possible accident.

2.1.13. OPGC officers will inspect the lowering of the bore well on getting information from the contractor to that effect.

2.1.14. The bore well shall be developed until stabilization and turbidity free clear water is obtained. Turbidity in final discharge shall not in no case exceed the acceptance limit of 5 units collected after minutes of starting the pumping of bore wells.

2.1.15. The lowering of the pipes shall be concentric with the bore hole, the eccentricity in no case shall exceed the tolerance limit of 2 inches in 100 ft. in case of 125mm diameter PVC Pipes.

2.1.16. The top one meter depth of the bore well should have a sanitary sealing after drilling of bore well.

2.1.17. After approval of layer chart by the EIC, housing pipes are to be lowered in presence of EIC or his representatives

2.1.18. OPGC authority will have the right to inspect the work and can reject partly and fully such portion of the works which is found defective in their opinion.

2.1.19. OPGC authority reserves the right to select / change the site, in case required and no compensation shall be paid to the contractor

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on this account.

2.1.20. After completion of the work, all surplus materials and debris are to be removed by the contractor and preliminary works such as scaffolding, platforms etc. are to be dismantled and all the materials are to be removed from the site, no extra payment will be made to the contractor on this account. The rate quoted should be inclusive of all these items.

2.1.21. After satisfactory completion of all the item of work in all respect as per design, specification of the bore well the payment to the contractor as per the measurement record shall be certified by the EIC.

2.1.22. Income tax, Odisha sales tax turnover tax as applicable shall be deducted from the contractor's bill as per the rules in force.

2.1.23. No compensation for any damage on account of any accident and natural calamities such as flood cyclone rain and condition of soil met during the execution of work etc. shall be paid to the contractor.

2.1.24. No part of the contract shall be sublet without permission of competent authority.

2.1.25. No extra charges for lead or any other reasons in case the contractor finds later on to have misjudged the availability of materials

Terms & Conditions of Contract:

1. Contract Price:

The Contract price for the above scope of work mentioned in BOQ stands at Rs.7,60,800.00 (Rupees Seven Lakhs Sixty Thousand Eight hundred only). The rates shall be firm during the contract period and inclusive of all applicable taxes, duties, levies, etc. except service tax which shall be paid extra as per actual. However, payment shall be made as per actual engagement or any fraction thereof in proportionate basis, duly certified by the OIC.

2. Contract Period:

The time period of work order will be 4(Four) months from the date of this work order, excluding mobilization period. All other terms and condition will be as per NIT.

3. Taxes & duties and Statutory Deductions:

Income tax and any other taxes, duties & levies and statutory dues as applicable shall be deducted from your bills at the rate ruling at the time of payment of bills.

4. Security Deposit and Release of Security Deposit:

05% of the bill value shall be retained as security deposit which shall be released only after the expiry of Defect Liability/Guarantee period if no defect is found within this period and after obtaining clearance from Engineer-in-charge. No interest shall be paid on this security deposit. EMD submitted along with bid will be adjusted against Security Deposit.

5. Defect Liability / Guarantee Period:

The job done by you shall be guaranteed for the period of 12 (twelve) months from the date of completion of work, against any defective material/ poor workmanship. You shall rectify the defect free of cost without any financial burden to OPGC.

6. Submission of bill:

Bills in triplicate along with the Service Tax A/C Code for the measured work shall be submitted to Engineer-In-charge for verification after completion of work. The bills shall be prepared & raised as per Rule 4(A) 1 of the Service Tax Rules showing-

- Name, address & registration number of such service provider
- Name, address of the person receiving taxable service
- Description, classification & value of taxable service provided
- Service tax payable thereon.

7. Payment of bill:

Payment after statutory deductions and other deductions like applicable taxes, duties, levies etc. shall be released against submission of bills duly certified by the Engineer-in-charge. The payment shall be made through e-mode facilities of RTGS / NEFT / Internet Banking. To facilitate the E-payment you shall return the enclosed Bank Mandate Form duly filled, along with the duplicate copy of the Work Order. All other terms are as per NIT.

8. Works Programme/Quality Assurance Plan /Safety Plan:

Before starting the work, you shall submit detailed works programme, milestone of different activities, safety and quality assurance plan of the work to the Engineer-in-charge for his approval after which work shall be started as per the approved programme. Any other documents required by the Engineer-in-charge for the above work shall be submitted.

9. Measurement of work:

The work shall be inspected / measured as directed by the Engineer-in-charge and entered in the measurement book with signatures of both contractor and Engineer-In-charge or their authorized representatives as a token of mutual acceptance.

10. Permit to Work:

Before the start of each work, you shall ensure that a valid and duly signed Permit to Work has been issued. Also, you shall ensure the issue of valid and duly signed Confined Space permit and Hot Work Permit if the same is required as per OPGC rule. All the permits shall

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be returned to the concerned Engineer after completion of the job.

11.0 Penalty:

- a) In case of failure to make payment to the workmen within 07(seven) days after wage period i.e. any month, penalty @0.1% of gross value of bill for corresponding period for which wage is due per day of default shall be imposed & deducted from the interim running bill maximum to the extent of 01% of the gross value of bill for the said period. Repetition of such default for more than three times shall lead for termination of the contract with 07(seven) days advance notice to you.
- b) In case of non-performance / continuous poor performance, the contract shall be terminated with 07(seven) days' notice and the work shall be done by any other means at your cost and risk till engagement of other agency. If the price of contract for the balance work shall be higher, the additional amount shall be recovered from the security or any dues of the contract or any other contract taken by you in OPGC.
- c) In case of labor strikes, you shall arrange fresh workmen and perform the contract without any discontinuation. If there is a discontinuation of work for consecutive 03(three) days, the "Termination of Contract" clause shall apply. This will debar you to participate in any future bld in OPGC for next 05 years.
- d) In case of failure to remove the scraps/debris within the stipulated period, the same shall be executed by other agencies at the cost and risk of the vendor and a liquidated damage @1(one)% of the contract value shall be imposed.
- e) In case of any OPGC material is lost or damaged during execution of work due to your negligence or wrong workmanship, the cost of the same as per prevailing market rate plus departmental expenses shall be recovered from your bills.

12. Termination of contract:

- a) In case of failure to start the work within due date, OPGC reserves the right to terminate the contract without reference to you.
- b) If the quality of the work is found to be unsatisfactory, the contract shall be terminated with immediate notice and the security deposit shall be forfeited.

13. Subletting:

The work shall not in any manner or degree be sublet. The work shall be executed under the direct supervision of the supervisors of your firm.

14. Indemnity:

You shall keep OPGC indemnified from all liabilities resulting out of this contract and act of your workmen.

15. Offloading of job:

In case it is observed during the tenure of the contract that you are not capable or in a position to complete the job, OPGC reserves the right to offload the same and get it done through other agencies at your cost and risk.

16. Labour Regulations:

- a) You shall submit a copy of Labour License (if applicable) from competent authority to the Engineer-in-charge.
- b) You shall submit Provident Fund Registration certificate to the Engineer-in-charge.
- c) You shall abide by all provisions of Contract Labour (R&A) Act 1970 and other applicable Labour Laws and rules made there under from time to time.
- d) Before commencement of work, you shall obtain a Group Insurance Policy covering employment accidental benefit in respect of your workmen to meet your liabilities against Employees Compensation (Workmen Compensation Act-1923) and furnish a copy of the same to the Engineer-in-charge. The work shall commence only after submission of the Group Insurance Policy to the EIC.
- e) Payment to your workmen shall be disbursed on or before the 7th day of the wage period in the presence of Engineer-in-charge or his duly authorized representative who shall certify on the payment sheet / register for fulfilment of provision of the Law.

17. Employees Provident Fund:

You shall declare that Provident Fund amount for the people engaged by you has been deposited as per rule.

18. Safety, Health, Environment and Quality:

- a) Your service personnel shall abide by all safety norms of OPGC as per enclosure and obtain safety induction training from OPGC Safety Officer before starting the work. Any violation in the safety rules shall be viewed seriously and you shall be penalized as per OPGC Safety Rules.
- b) You shall ensure the medical fitness of your service personnel before start of work.
- c) You shall submit Safety Plan of the work to the Engineer-in-charge before start of the work.
- d) While driving two wheelers inside the plant boundary Crash Helmet to be used positively. Violation of this rule will attract penalty.

19. Engineer-In-Charge (EIC):

Manager-Ashpond, ITPS or his authorized representative is the Engineer-In-charge

20. Paying Officer:

DGM -Finance - ITPS is the Paying Officer.

21. Dispute settlement

Any dispute or difference arising out of this contract shall be mutually settled and the decision of the Managing Director, OPGC or his

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authorized representative shall be final & binding.

22. Jurisdiction:

Appropriate Court at Bhubaneswar under the Odisha High Court shall have exclusive jurisdiction over all matters related to this contract.

All other terms and conditions not specifically stated in the foregoing clauses shall be as per tender documents and shall form a part of this Work Order.

You are requested to acknowledge receipt of this Work order and return us the enclosed duplicate copy duly signed on each page as a token of your unconditional acceptance and acknowledgement. In case we do not receive the signed duplicate copy within 07(seven) days, it will be treated that you have accepted this work order in its entirety.

Special Terms & Conditions:

SPECIAL CONDITIONS

Name of work: "Water Sampling Bore wells for Hydrogeological Study job at IB thermal Power Station, Banharpali, Jharsuguda"

1) 5% security deposit & Income tax, Sales tax as applicable shall be recovered from the bills. Security deposit shall be refunded after the defect liability period of twelve month is over. If any defect is found during this period, the contractor has to rectify the same at free of cost. If the contractor fails to do so within 07 days of getting the information from the engineer in charge, then the work will be rectified by engaging another agency and the cost will be deducted from the security deposit of the contractor.

2) The period of contract shall be four months.

3) The contractor is required to mobilize his men, materials, plant & equipment at his work site within 7 days of the date of issue of LOI/Work Order at the commencement of the contract, failing which the Engineer-In-Charge will annul the contract agreement at his discretion. In the event of any such annulment, the owner reserves the right to recover the cost and other financial losses from the contractor in any manner deemed legally correct besides forfeiture of the EMD converted as ISD. The onus of proving that the delay in mobilization was beyond the control lies with the contractor. The Engineer-in-charge after satisfying himself with the reason for the delay if any, may allow extension of time to avoid the annulment of the contract.

4) All the vehicles used for the purpose of the work should have proper documents and driver should have professional license.

5) Any defective work noticed within the defect liability period shall be rectified by the contractor immediately on receipt of information.

6) If management at any point of time feels that the agency is intentionally avoiding the work, It may engage any other agency to get the work done and deduct an amount equal to twice the amount spent to get the work done. Contractor shall have no right to dispute the agency through which work is done & the amount spent to get the work done.

7) At any time from the commencement of the work if the owner decides for whatsoever reason, not to carry out the whole work or part thereof as specified in the tender, then owner shall give notice in writing of the fact to the contractor, who shall have no claim to any payment or compensation on whatsoever account (profit or advantage which he might have derived by executing the work in full) neither shall he have any claim for compensation by reason of any alterations having been made from the original specification drawings, design and instruction which may involve any curtailment of the work as originally contemplated.

8) Water which may accumulate on the site during the progress of the work or in trenches shall be removed from the site to the satisfaction of the Engineer-in-charge at the contractor's expense.

9) The contractor shall not at any time do, cause or permit any nuisance on the site or do anything which shall cause unnecessary disturbance or inconvenience to owner or occupiers of the other properties near the site and to the public generally and must ensure healthy environment and shall not pollute any water source. In the event contractor fails to do so all penalties and cost of compliance of the same shall be charged from the contractor.

10) As the works are of emergency nature and are to be completed in a time schedule, the contractor may be requested to carry out works during night and/or on Sundays and authorized holidays for which the contractor be given permission in writing by the Engineer-in-charge.

11) The contractor shall draw water for the purpose from a source indicated by the Engineer-in-charge at his own expense. All pipe lines, pumps and other accessories required for taking the water to the site of work shall be provided by the contractor at his own cost. He shall not be entitled to any payment on account of the expenditure incurred in providing the pipelines, pumps etc.

12) The contractor has to keep experienced supervisors at site with site order books to receive order/direction from engineer during site visit.

13) Above all the contractor should visit the site and get him acquainted with the site condition before quoting rate for the tender. Further he should go through the job safety analysis and comply with all the points for safe execution of work and prevention of environment pollution.

14) The objective of the project is to come out with the most optimal solution to suit the conditions and achieve this work without causing any interruptions in the continuous running of the power plant. The contractor shall thoroughly examine all the features involved in the process of implementation and adopt the appropriate methodology/techniques and sequence of execution of various works. The following aspect shall be taken in to consideration:-

15) All statutory dues as levied by Central, State Government and Local authorities shall be recovered from the contractor's bill. Such deductions shall not be reimbursed in any case.

16) The contractor has to arrange all the materials & equipment required for the work at his own risk and cost.

17) Materials and equipment's for the work are to be arranged by the contractor and it is the responsibility of the contractor for safe custody of materials. The entire incidental charges such as transportation, execution, storage of materials etc. will be borne by the contractor. The rates quoted should be inclusive of all such charges.

18) Damage of any structure, equipment, cable line will be repaired/ replaced by the contractor at his own cost. If the contractor fails to do so then the cost of the same will be recovered at penal rate from the bill of the contractor.

19) Compensation including cost of any suit for Injury to persons or property due to negligence in observation of any major precaution and

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also sums which may become payable under workmen compensation act are to be paid by the contractor.

20) Under no circumstances interest is chargeable by the contractor for the dues or additional dues, if any payable to him for the work.

21) No advance payment shall be made to the contractor at any stage. Payment shall only be made after satisfactory completion of the works.

22) The authority reserves all right to reject any or all the tenders without assigning any reasons thereof.

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SERVICE ORDER No : 3500000654

Price Schedule

Item	Service Short Text	Qty.	UoM	Rate	Taxes/Overheads		Amount
10	Water sampling borewells	1	AU	760,800.00	Basic Price	:	760,800.00
					Service Tax	:	45,648.00
					Total		806,448.00
Sr. No	Service Description	Quantity	Unit	Price per Unit	Net Value		
10	Labour for drilling vertical bore hole	480.000	M	510.00	244,800.00		
Labour for drilling a perfectly vertical bore hole of specified dia (125mm) for a specified depth below ground level through consolidated and unconsolidated rock with down the hole hammer drilling rigs or combination drilling rigs as required to suit the site condition as per the direction of engineer-in-charge including supply of rigs with its accessories ,T&P and consumables etc for lowering 125 mm dia PVC pipe with socket and with or without well screens as per the necessity for the soft, medium and hard formation. (PVC/G.I/M.S pipes, Casing pipes if required to prevent collapse of over burden is to be provided by the contractor including lowering and withdrawing after completion of the Bore-well.) (Payment will be made as per the actual execution)							
20	Supply & lowering of 125mm dia Casing	390.000	M	850.00	331,500.00		
Supply and lowering of 125 mm dia Casing Pipe (Schedule-80) with all materials manpower etc complete as per instruction of EIC (Payment will be made as per the actual execution)							
30	Supply & lowering of perforated Casing	90.000	M	1,050.00	94,500.00		
Supply and lowering of perforated Casing pipe with all materials manpower etc complete as per instruction of EIC (Payment will be made as per the actual execution)							
40	Cleaning & developing bore well	6.000	NO	6,000.00	36,000.00		
Cleaning and developing the bore well with compressor continuously worked till clear and adequate discharge is obtained from the well including supply and use of all necessary equipments and labour as per the direction of engineer-in-charge.							
50	Water yield testing for bore wells	6.000	NO	3,300.00	19,800.00		
Water yield testing for the bore wells.							
60	Providing & fixing well cap	6.000	NO	2,950.00	17,700.00		
Providing and fixing well cap, including supply and installation of column pipe 600mm Length of approved make with duly flanged. with locking arrangements and all accessories etc# all complete as per instruction of EIC.							
70	Construction of BoreWell platforms 1MX1M	6.000	NO	2,750.00	16,500.00		
Supplying all labour,T&P for constructing of Bore - Well platforms of 1.0 mtr X 1.0 mtr 0.15 m thick with cement concrete 1:2:4 using 12 mm hard granite chips including cost, conveyance of all materials to site as per specification, design and drawing etc complete.							

Signature
2/3/17

ANNEXURE - 2



OPGC
Power for Progress

ODISHA POWER GENERATION CORPORATION LTD.
(A Government Company of the State of Odisha)
CIN U40104OR1984SGC001429

Regd. Off. : Zone-A, 7th Floor, Fortune Towers, Chandrasekharpur, Bhubaneswar - 751023, Odisha
Ph. 0674-2303765 - 66. Fax : 0674-2303755 / 56
Web www.opgc.co.in.

Letter No: OPGC/3534

Date: 01-12-2015

To
The Director (Thermal-IA)
Ministry of Environment, Forests and Climate Change
3rd floor, Vayu Block
Indira Paryavaran Bhawan, Jor Bagh Road
Aliganj, New Delhi-110003

Kind Attention: Shri B. B Barman

Sub: Expansion of existing Coal Based Thermal Power Plant by addition of 2X660 MW (Unit 3 & 4) at village Banharpalli, in Jharsuguda District in Odisha by M/s Odisha Power Generation Corporation Limited- Request for amendment of clause no. 4 (v) of the Environment Clearance dated 04.02.2010.

Ref: 1. Environment Clearance (EC) issued vide MoEF letter no. J-13011/59/2008-IA.II (T) dated 04-02-2010.
2. Amendment of EC issued vide MoEF letter no. J-13011/59/2008-IA.II (T) dated 22.01.2014.
3. Extension of validity of EC issued vide MoEF letter no. J-13011/59/2008-IA.II (T) dated 16.01.2015.

Sir,

With reference to the subject cited above, it is to intimate that in Clause no. 4(v) of the EC dated 04.02.2010, it is inadvertently mentioned that a twin flue stack of 275m height shall be provided with continuous online monitoring equipments for measurement of RSPM (PM_{2.5} & PM₁₀). As per the environmental norms, RSPM (PM_{2.5} & PM₁₀) is normally monitored for ambient air and stack flue gas is being monitored online for particulate matters.

Hence you are requested to kindly amend the clearance suitably.

Your kind support & communication is highly solicited.

Yours faithfully,

[Signature]
11/12/15

Senior Manager (Mechanical)

CC: The Director (S), Ministry of Environment, Forests and Climate Change, Govt. of India, Eastern Regional office, A/3, Chandrasekharpur, Bhubaneswar-751023

ANNEXURE -3

TENTATIVE FLY ASH UTILISATION PLAN

Unit -

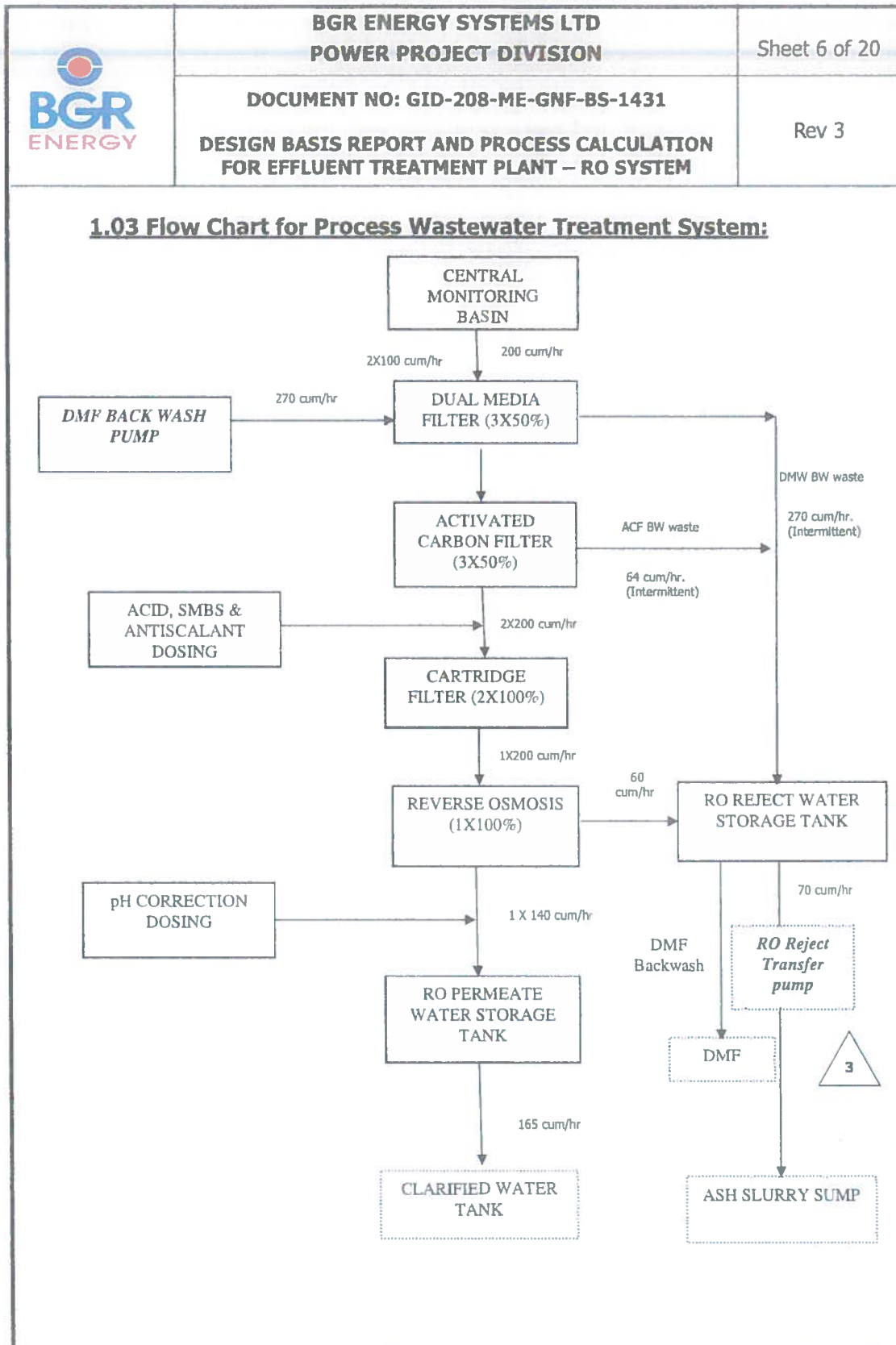
000' MT

Sl. No	Utilization Heads	1st Year	2 nd Year	3rd Year	4th Year
1	Captive ash bricks/blocks manufacturing	15	15	15	15
2	Outside Bricks plants	20	20	25	30
3	Construction in nearby highway projects, other road projects & Land development.	250	250	250	200
4	Cement plants.	120	120	120	120
5	Ready -Mixed Concrete.	10	10	10	10
6	Ash Export	120	150	150	150
7	Back filling in nearest mine void / concurrent backfilling in captive mine void	535	719	1035	1615
8	Unutilized Fly Ash disposal to Ash Disposal Area.	1070	856	535	Nil
Qty of Fly Ash Utilization		1070	1284	1605	2140
% of Fly Ash Utilization		50%	60%	75%	100%
Expected Qty of Fly Ash generation per annum		2140	2140	2140	2140
Expected Qty of Bottom Ash generation per annum		540	540	540	540
Expected Qty of Ash generation per annum		2680	2680	2680	2680

ANNEXURE - 4

Sl. No.	BENTONITE CLAY LINING (IMPERVIOUS CLAY LINING)	HDPE/LDPE LINING
1	Hydraulic conductivity is more and hence less suitable	Hydraulic conductivity is less and hence more suitable
2	Subject to deterioration from differential settlement, desiccation and freeze-thaw action of soil in long run	Not affected by these soil factors
3	Material consistency and quality control is difficult as it is ensured at site	Material consistency and quality control is easy as it is monitored during manufacturing process in factory
4	Cost is less if clay is locally available	Cost is more as compared to clay liner
5	Suitable quality of clay is generally not available in nearby borrow areas	Easily available in market
6	Thickness of lining is more (generally 0.5 to 1.0m) and hence can not be punctured easily	Susceptible to puncture damage and lateral squeezing & thinning during construction due to less thickness (generally 10mm to 20mm)
7	Time of construction is more due to difficulty in construction thereby affecting the project schedule	Time of construction is less due to ease & speed of installation

ANNEXURE -05



ANNEXURE - 06



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Regd. Off. : Zone-A, 7th Floor, Fortune Towers, Chandrasekharpur, Bhubaneswar - 751023, Odisha

Ph. : 0674-2303765 - 66, Fax : 0674-2303755 / 56

Web : www.opgc.co.in,

No. 350/14 E
Df. 16-02-2017.

To

Regional Director,
South-Eastern Region,
Central Ground Water Board,
Bhujal Bhawan, NH-V, Khandagiri
Bhubaneswar - 751030

Sub: Rain Water Harvesting & Artificial Recharge reports for Manoharpur Coal Block & IB Thermal Power Station - reg

Ref: 1) This Office Letter No: 1612 W/E , Dtd. 28.06.2013

2) Your Letter No: 5 - 22 / SER / CGWA / 2013 - 613

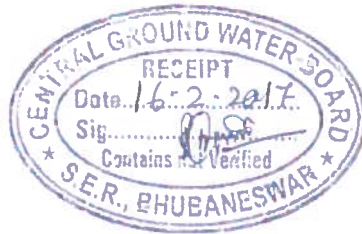
3) This Office Letter No: 580 W/E , Dtd. 17.02.2014

Sir,

This is to inform you that OPGC has submitted WMP, RWH & AR reports for Manoharpur Coal Blocks & RWH & AR report for IB Thermal Power Station vide Letter No. 1612 W/E , Dtd. 28.06.2013 (Copy enclosed). Further as per your intimation (Copy enclosed) OPGC has submitted the clarification vide Letter No. 580 W/E, Dtd. 17.02.2014 (Copy enclosed). It is pertinent to mention here that MOEF Eastern Regional Office has asked OPGC to intimate the time frame for action plan & implementation of the same (Copy enclosed).

In view of this, we are submitting the RWH & AR report for IB Thermal Power Station for your reference and approval.

Thanking You



Yours faithfully,

[Signature]
Chief Manager (Civil) 16/02/17

Encl. As above & Report. O/C

ANNEXURE - 8

List of CSR Projects OPGC II (Unit 3 & 4)

Project Theme	S.N.	Project Description	Village	Gram Panchayat	Approved Budget by CSR Committee in Rs. Lakhs
Education	1	Construction of Anganwadi	Junanimunda	Rajpur	10.00
	2	Books, cabinet, Almirah for Library at Ashram School	Kanaktura	Kanaktura	4.00
	3	Additional school building	Kechubahal	Chandnimal	25.00
	4	Additional school building for U.P. school	Beleituda	Rajpur	25.00
	5	Cycle stand for 100 Children in High School	Phatapali	Tilia	5.00
	6	Construction of High School Building	Remenda	Remenda	40.00
	7	Construction of School Building & Anganwadi Centre	Telenpali	Telenpali	25.00
	8	Construction of 02 Additional Class Rooms in High School	Banharpali	Telenpali	15.00
	9	Construction of Cycle Stand at U.P. School	Banharpali	Telenpali	5.00
	10	Construction of two Classrooms at School	Bargad	Kusuraloi	15.00
Water & Sanitation	11	Drinking water project	Sarbahal	Sanghumda	20.00
	12	Drinking water facility	Kechubahal	Chandnimal	10.00
	13	Installation of drinking water project	Beleituda	Rajpur	22.00
	14	Water & Sanitation project in 02 G.P of Kusuraloi and Tilia	02 G.P	02 G.P	1100.00
	15	Toilet for Girls in High School	Phatapali	Tilia	5.00
	16	Kumarbandh Education Complex (School & College) Drinking Water Project	Kumarbandh	Kumarbandh	5.00
	17	Kumarbandh College Sanitation Project	Kumarbandh	Kumarbandh	10.00
	18	Kumarbandh Police Station Sanitation Project	Kumarbandh	Kumarbandh	5.00
	19	Renovation/ Extension of Drinking Water Facility at School	Phalsamunda	Kusuraloi	2.50
	20	Total Water & Sanitation project	09 villages	Telenpali	359.00
	21	Construction of Toilet Facility at District Police Line	Jharsuguda	Jharsuguda	30.00
	22	Deepening of village Pond	Sarbahal	Sanghumda	10.00
	23	Deepening of village Pond	Kanaktura	Kanaktura	5.00
	24	Construction of Bathing Ghat	Kechubahal	Chandnimal	3.00
	25	Renovation of Pond (Gheemunda) Rohidas Para	Chandnimal	Chandnimal	5.00
	26	Digging of village Pond	Gaudmal	Gaudmal	12.00
	27	Renovation of Pond & Construction of Bathing Step (Bada Kanta)	Rajpur	Rajpur	10.00
	28	Deepening of Village Pond	Ambdhar	Rajpur	10.00
	29	Construction of Community Centre	Sarbahal	Sanghumda	10.00
	30	Repairing internal village roads	Sarbahal	Sanghumda	10.00
	31	Construction of Community Centre	Ambdhar	Rajpur	10.00
	32	Construction of Community Centre	Kechubahal	Chandnimal	10.00
	33	Construction of Community Centre	Chandnimal	Chandnimal	10.00

Project Theme	S.N.	Project Description	Village	Gram Panchayat	Approved Budget by CSR Committee in Rs. Lakhs
	34	Construction of Road	Ambdhar	Rajpur	20.00
	35	Construction of Bus Stop at Municipality	Belpahar	Belpahar	5.00
	36	Construction of Road to village	Gaudmal	Gaudmal	12.00
	37	Ramela Pada Community Centre	Basudera	Tilia	8.00
	38	Phatapali (Saharapada) Community Centre	Phatapali	Tilia	8.00
	39	Community Centre (Near Bus Stand)	Tilia	Tilia	8.00
	40	Community Centre (near Tilia market)	Nuapada	Tilia	8.00
	41	Bhagabanpali Kanta (Birtia) Renovation	Bhagbanpali	Tilia	4.00
	42	Tehadi pond renovation (near Tulsi Sahu High school)	Sunarimunda	Tilia	4.00
	43	Junhabandh (Singheipali) Pond Renovation	Singheipali	Tilia	4.00
	44	Shabandh (Kantatikra) Pond Renovation	Kantatikira	Tilia	4.00
	45	Thorapali Pond Renovation	Thorapali	Tilia	4.00
	46	Sivakanta Bathing Steps (two)	Badasura	Tilia	3.50
	47	Nua Kanta Bathing Steps (two)	Pudhipali	Tilia	3.50
	48	Pipal Kanta Bathing Steps (two)	Kantatikira	Tilia	3.50
	49	Tali Kanta Bathing Steps (two)	Phatapali	Tilia	3.50
	50	Community Centre (Kantatikira)	Rengali	Kumarbandh	8.00
	51	Street Light	Rengali	Kumarbandh	7.00
	52	Bada Bandha Renovation and 02 Bathing Steps	Temporarypada	Kumarbandh	7.00
	53	Rengali Bandha 02 Bathing Steps	Rengali	Kumarbandh	3.50
	54	Pond Renovation	Bhaludole	Kumarbandh	4.00
	55	Pond Renovation	Banikdera	Kumarbandh	4.00
	56	Pond Renovation	Kantapali	Kumarbandh	4.00
	57	Dunguri Kisan Pada Pond Renovation & 02 Bathing Steps	Rengali	Kumarbandh	7.00
	58	Sajni Kanta Pond Renovation	Budhapali	Kumarbandh	4.00
	59	Construction of Community Centre	Sargipali	Kumarbandh	15.00
	60	Construction of Women Development Centre	Rengali	Kumarbandh	10.00
	61	Electrification of Village(Part of WASH Project)	Sahareipada	Telenpali	7.00
	62	Improvement of Internal Road	Banharpali	Telenpali	20.00
	63	Improvement of Road from Banharpali village to Shiva Temple	Old Adhapada	Telenpali	15.00
	64	Construction of Bus Stop	Kusuraloi	Kusuraloi	5.00
	65	Construction of Kalyan Mandap at Suitable Place	Telenpali G.P	Telenpali	30.00
	66	Deep Borewell (Barihapali)	Bishipali	Sunari	5.00
	67	Temporarypada Bada Bandha Renovation and 02 Bathing Steps	Barihapali	Sunari	7.00

Project Theme	S.N.	Project Description	Village	Gram Panchayat	Approved Budget by CSR Committee in Rs. Lakhs
Rural Development	68	LED Street Light on Main Road from Samalei Temple to Kumarbandh College	Kumarbandh	Kumarbandh	25.00
	69	LED Street Light on Main Road	Binika	Telenpali	15.00
	70	LED Street Light on Main Road	Banharpali	Telenpali	5.00
	71	LED Street Light on Main Road	04 G.P	04 G.P	150.00
	72	Installation of High Mast light	Adhapada	Kusuraloi	9.00
	73	High Mast Light in Telenpali Market/Bus Stop/tyre Chowk	Telenpali	Telenpali	9.00
	74	Rani Sagar (Sapali) 02 Bathing Ghats	Sapali	Telenpali	3.50
	75	Renovation of Rengal Kanta & 02 Bathing Steps	Dhobadera	Telenpali	7.00
	76	Bus Stop at Telenpali Market Bus Stand	Telenpali	Telenpali	5.00
	77	Street Light at village	Dhobadera	Telenpali	5.00
	78	Street Light at village	Telenpali	Telenpali	15.00
	79	Telenpali Upper Bandh Bathing Ghat (two)	Telenpali	Telenpali	3.50
	80	Community Centre	Binika	Telenpali	8.00
	81	Renovation of Asthai Kanta	Adhapada	Kusuraloi	10.00
	82	Multi-purpose Training Hall Inside PHC Building along with Filtered Drinking Water Facility	Adhapada	Kusuraloi	15.00
	83	06 (six) Bathing Ghats in four villages of Kushraloi etc.	Kerualbahal	Kusuraloi	10.00
	84	Community Centre	Adhapada	Kusuraloi	11.00
	85	Repair/ Extension of Community Centre	Phalsamunda	Kusuraloi	5.00
	86	Deepening of Village Pond & 02 Bathing Steps	Phalsamunda	Kusuraloi	7.00
	87	Deepening of Naik Kanta	Khandsa	Kusuraloi	4.00
	88	Renovation of Village Pond	Bargad	Kusuraloi	4.00
	89	Street Light in village	Phalsamunda	Kusuraloi	5.00
Live	90	NTPF Processing Unit for Women's SHGs	Kalamegha	Sanghumda	3.00
Skill Dev. of Local Youth	91	Skill Development for Local Youth	Hemgiri	Hemgiri	15.00
	92	Construction of Check Dam	Ambdhar	Rajpur	5.00
	93	Tali Kanta Irrigation Project	Telenpali	Telenpali	25.00
	94	Construction of Canal from Asthai Kanta to Goucharmal at Adhapada	Adhapada	Kusuraloi	15.00
Physical Monitoring	95	Baseline survey in peripheral villages	37 villages	11 G.P's	20.00
	96	Physical Monitoring of projects, documentation, training and capacity building overheads etc.	-	-	20.00

Total CSR Budget (OPGC II- Unit 3&4) Approved by 194th BOD on 09-03-2017

2542.00



Health, Safety and Environment Policy

OPGC Project Management believes that everyone has a right to a safe workplace and a duty to protect our environment, and incorporates health, safety and environmental management as an integral part of the business thus enhancing the performance of OPGC 2x660MW Supercritical Coal Fired Power Plant to a World Class performer.

The health & safety and wellbeing of all persons, including employees, contractors, visitors and members of local communities, are the first consideration at OPGC. Safe behavior and concern for the environment are considered essential measures of performance at all levels.

All occupational accidents are considered to be preventable, and each individual is responsible for their own safety as well as the safety of their workmates and other persons affected by their work activities. Everyone has the right to stop work in case of imminent danger to human health.

The OPGC Project Management is committed to implement its health, safety and environmental policy in the following manner:

- To ensure that adequate resources are allocated and appropriate responsibilities are identified, sufficient to meet the requirements of its Health, Safety and Environmental Plan.
- By the establishment and implementation of programs and best practices "for conducting safe, healthful, and environmentally sound operations.
- Being in full compliance with or exceeding applicable India health, safety and environmental laws and regulations, permits requirements and shareholders requirements.
- By taking into consideration other international health, safety and environmental standards and guidelines, as appropriate.
- Making the necessary efforts for the prevention of environmental pollution, and will seek to effectively and efficiently utilize natural sources.
- The project will improve its health safety and environmental performance continuously by setting and reviewing objectives and targets with the required performance measurements and assessments.

Ron McParland

Executive Director (Construction)

Reviewed On 31st December 2015

