



Power

Ref: APL/REGL/TPP/EMD/MoEFCC/EC/304/11/21
Date: 24.11.2021

To,
Dr. Bhardwaj Adiraju,
Ministry of Environment, Forests & Climate Change,
Integrated Regional Office, Aranya Bhawan, North Block
Sector 19, Naya Raipur, Atal Nagar,
Chhattisgarh 492 002

Sub: Submission of Six Monthly Compliance status of Environment Clearance (EC) for 1x600 MW Raigarh Energy Generation Limited, a Coal based Thermal Power Plant at village Chote Bhandar, Bade Bhandar, Sarvani & Amali Bhona in Tehsil Pussore of Raigarh District, Chhattisgarh for the period of October'2020 to March'2021.

Ref: Environment clearance vide letter no. **J-13012/57/2008-IA.II (T) dated 20.05.2011** and its subsequent amendment vide letter dated 16.04.2015 and 26.11.2019.

Dear Sir,

With reference to the above, please find herewith enclosed Six monthly Environment Clearance (EC) compliance status report for the period of **April'2021 to September'2021** of 1x600 MW Coal Based Thermal Power Plant at village Chote Bhandar, Bade Bhandar, Sarvani & Amali Bhona in Tehsil Pussore of Raigarh District, Chhattisgarh by Raigarh Energy Generation Limited in hard and soft copy (**e-mail**).

This is for your kind information and record please.

Thanking You,
Yours faithfully,
for Raigarh Energy Generation Limited

(Santosh Kumar Singh)
Head – Environment

Encl.: As above

CC:
Member Secretary,
Central Pollution Control Board,
Parivesh Bhavan, East Arjun Nagar,
New Delhi – 110 032
Regional Officer

Chhattisgarh Environment Conservation Board,

TV Tower road, Raigarh – 496 001, Chhattisgarh

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Member Secretary,
Chhattisgarh Environment Conservation Board,
Prayavas Bhavan, North Block, Sector-19,
Naya Raipur – 490 009, Chhattisgarh

SIX MONTHLY COMPLIANCE REPORT OF ENVIRONMENTAL CLEARANCE (EC)

for

**RAIGARH ENERGY GENERATION LIMITED
600 (1x600) MW THERMAL POWER PLANT**

At

**BADE BHANDAR VILLAGE, PUSSORE TEHSIL
RAIGARH DISTRICT CHHATTISGARH**

Submitted to:

**Integrated Regional Office
Ministry of Environment, Forest and Climate Change
Chhattisgarh Environment Conservation Board, Raipur &
Central Pollution Control Board, New Delhi**



Submitted By:

**Environment Management Department,
Raigarh Energy Generation Limited,
Bade & Chhote Bhandar Village, Pussore Tehsil
Raigarh District, Chhattisgarh**

PERIOD: April'2021 – September'2021

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Raigarh Energy Generation Limited
(1x600 MW Coal Based Thermal Power Plant)

Introduction

"Raigarh Energy Generation Limited (formerly known as Korba West Power Company Limited) has set up a coal based thermal power plant of capacity 1x600 MW at village Chote Bhandar, Bade Bhandar, Sarvani & Amali Bhona, in Tehsil Pussore of Raigarh District.

REGL has been granted Environmental Clearance by Hon'ble MoEF&CC vide letter No. J-13012/57/2008-IA.II (T), dated 20.05.2010 and Amendment of Environmental Clearance for Coal transportation by way of Road for an interim period of three years dated 16.04.2015. MoEF&CC has already granted change in name of Environmental Clearance vide letter dated 22.10.2019"

REGL is committed towards Environment and its community it operates within. The company has adopted four project affected peripheral villages and executing most of the CSR works in those villages in the field of their livelihood, infrastructure development, cleanliness, community health and education.

REGL has engaged M/S Vardan Envirolab, Gurgaon, (HR) for their service of sampling, monitoring and analysis as per statutory guidelines. Stations were identified by the Environmental Officer of REGL. The samples were analyzed partly at site and partly at their MoEF & CC recognized laboratory situated at Gurgaon. This report presents the data generated for the First & Second quarter. The report includes sampling locations, methodology, testing procedure and compilation for the Environmental parameters i.e. Air, Water & Noise with a view to evaluate the impact due to the thermal power plant activities.

Our unit is not in operation since 22nd May 2017 due to major breakdown of generator earth failure. Hopefully we will be able to resume our operation from 15th December'2019.

Raigarh Energy Generation Limited
(1x600 MW Coal Based Thermal Power Plant)

Environmental Clearance No: F. No. J 13012/57/2008-IA. II (T), dated: 20.05.2010 and its subsequent amendment vide letter dated: 16.04.2015 and extension dated 26.11.2019 & 17 & 30.07.2020

Sr. No.	EC Conditions	Compliance Status
A.	Specific Conditions	
i	Detailed hydro-geological study shall be conducted and submitted within six months from an institute/organization of repute to assess impact of surface water regime. Specific mitigation measures shall be spelt out and action plan for implementation of the same shall be provided. It shall be ensured that the area drainage is not disturbed due to the proposed power plant.	Complied. Hydro-geological study has been done by reputed institute "National Institute of Hydrology, Roorkee" and report has already been submitted. The entire plant area is almost flat. There are no streams within the plant premises. Regular water quality monitoring being carried out by an agency accredited by NABL & recognized by MoEF&CC.
ii	Hydro-geological study of the area shall be also 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 at any stage, immediate mitigating steps to contain any adverse impact on ground water shall be undertaken.	Being Complied. The annual review of hydro-geology has been carried out, The ground water quality and ground water level monitoring being carried out on regular basis monitoring report is enclosed as Annexure – I .
iii	Source of water for meeting the requirement during lean season shall be specified and submitted to the Regional Office of the Ministry within three months.	Being complied. 15 MCM Water has been allotted from Mahanadi River by Water Resources Dept. Govt. of Chhattisgarh vide letter no. 2705/F4 66/S-2/31/OJPRE/07, Raipur dated 25.04.2018. This quantity is adequate to meet the plant's requirement, including the lean season.
iv	No ground water shall be extracted for use in operation of the power plant even in lean season.	Noted. Being Complied.
v	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.	Complied. There is no water body within the power plant premises.
vi	COC of 5.0 shall be adopted.	COC of 5.0 is being maintained during plant operation.

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Sr. No.	EC Conditions	Compliance Status
vii	Local employable youth shall be trained in skills relevant to the project for eventual employment in the project itself. The action taken report and details thereof to this effect shall be submitted to the Regional Office of the Ministry and the State Govt. Dept. concerned from time to time.	Being Complied. Around 70 Number of regular employment has been created which is 36% of total on Roll employees. For contractual side we deploy 340 number we have deployed which is 43% of total contract manpower.
viii	Additional soil for levelling of the proposed site shall be generated within the sites (to the extent possible) so that natural drainage system of the area is protected and improved.	The entire plant area is almost flat. There are no streams within the plant premises.
ix	Provision for installation of FGD shall be provided for future use.	Space for FGD is provided in plant layout. As per CPCB directions vide letter no. B33014/07/2017-18/IPC-II/TPP/15860 dated 11.12.2017. However, as per MoEF&CC's Notification dated 31st March 2021, Raigarh TPP is falling under Category "C" Non- retiring TPPs and the timelines for compliance of SO ₂ emission is up to December 2024. Accordingly the work is under progress for compliance as per CPCB direction.
x	A stack 275 m with flue gas velocity of 25 m/s shall be installed.	Complied. Flue Stack of 275 meter constructed. The designed flue gas velocity is more than 25 m/sec.
xi	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm ³ .	A High Efficiency Electrostatic Precipitators has been provided (ESP) to meet particulate emission less than 50 mg/Nm ³ . Monitoring report enclosed as <u>Annexure- I</u>
xii	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.	Adequate dust suppression system like water sprinkling system, dust extraction system, dry fog dust suppression system has been installed throughout coal handling chain and bag filters in LHS, RHS bunkers and crusher house, The high concentrated slurry disposal system and closed transferring pipelines have installed for ash disposal in dyke.
xiii	Utilization of 100% Fly Ash generated shall be made from 4 th year of operation of the plant. Status of implementation shall be	100% of Fly Ash utilization is achieved in FY 19-20. Fly ash utilization for the FY 20-21 was <100% due to COVID -19 and NGT banned low

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Sr. No.	EC Conditions	Compliance Status
	reported to the Regional Office of the Ministry from time to time.	lying are filling in Raigarh district. Fly Ash utilization report is attached as Annexure – II.
xiv	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized fly ash shall be disposed-off in the ash pond in the form of slurry form. Mercury and other heavy metals (As, Hg, Cr, Pb etc.) will be monitored in the bottom ash as also in the effluents emanating from the existing ash pond. No ash shall be disposed off in low lying area.	Being Complied. We have established two nos. of silo (Intermediate and Main) with capacity of 1000 MT & 2500 MT respectively for utilization of dry fly ash. High concentration slurry disposal system is provided for disposal of unutilized ash in ash pond. Ash water circulation system is provided. Monitoring of Mercury and other heavy metals (As, Cr, Pb etc.) is being carried out regularly and report is enclosed in Annexure – I.
xv	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.	Complied. Well-designed Ash pond with LDPE lining has been established as per guidelines of MoEF/CEA/CPCB. Safety measure such as bund with toe wall and lining of side slope done to prevent any leachate.
xvi	For disposal of Bottom Ash in abandoned mines (if proposed to be undertaken) 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.	Compliance assured.
xvii	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 75 %.	Green belt / plantation is being developed. Approximate 209,772 trees have been planted. Local plant species being preferred for the plantation as fast growing with thick canopy cover adequate height with longer duration of foliage, Perennial and evergreen along with fruit bearing plants in adequate have also been planted. Greenbelt development plan has been approved by DFO. Greenbelt development status is enclosed as Annexure - III.
xviii	Two nearest village shall be adopted and basic amenities like development of roads, drinking water supply, primary health	Being Complied Four project villages are adopted for development of basic amenities such as

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Sr. No.	EC Conditions	Compliance Status
	centre, primary school etc. shall be developed in co-ordination with the district administration.	construction of approach road, community hall, school room, safe drinking water facilities have been completed in all the adopted villages. Pond deepening work has been under taken in village Badebhandar and Sarwani. Tailoring training has been started from September 2020. 30 girls undertook tailoring training (Self Employed Tailor) during the reporting period. The activities carried earlier are being monitored and sustained by the beneficiaries. Detailed CSR activities are enclosed as Annexure IV.
xix	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.	CSR activities being carried out in consultation with district administration for the development of neighbouring villages. Mobile Health Care Unit (MHCU) started for providing free of cost treatment and medicines at the doorsteps of the 15 peripheral villagers. Also actively participating in GOI flagship program "Poshan Maah" in coordination with department of women and child welfare. Various activities organised during the Poshan Maah in villages to raise awareness among people specific to women and children for reduction of malnutrition and anaemia. Global Hand Washing Day observed to create awareness and school children on importance of washing of hands, health and hygiene. Water analysis report attached is showing fluoride data in nearby ground water regime is enclosed as Annexure - I. Detailed CSR activities are enclosed as Annexure IV.
xx	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.	The project is out of Abadi/population area. The R&R plan has already been prepared, implemented, under progress and submitted to MoEF & CECB, Raipur.

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xxi	An amount of Rs 6.0 Crores shall be specially earmarked for development activities for tribals of the nearby villages as committed by the project proponent vide its letter dated 23.03.2010. Specific schemes for upliftment of tribal families mentioning sustainable livelihood schemes shall be submitted to the Ministry within three months with time bound implementation and in-built monitoring programme. The above amount shall be over and above the fund earmarked for CSR activities.	The requisite amount for tribal development has been spent and the expenditure report of 6.52 crore has been submitted. Specific livelihood schemes like poultry, mushroom production and vegetable cultivation is being carried out for upliftment of the tribal families. Tailoring training is also undergoing where interested tribal women is attending the training. Self-Help-Groups (SHGs) of women have been formed in the villages to take up various livelihood schemes. Two tribal cooperatives formed to take up various livelihood schemes. These are registered cooperative society. Besides above, infrastructure development activities like construction of CC road, community hall, sanskritik manch, drinking water facility etc. have been undertaken in the tribal villages for their upliftment. CSR report for the period April to September 2021 is attached as Annexure – IV .
xxii	Further an amount of Rs 15.0 Crores shall be earmarked as one time capital cost for CSR programme as committed by the project proponent vide its letter dated 23.03.2010. Subsequently a recurring expenditure of Rs 3.0 Crores per annum shall be earmarked as recurring expenditure for CSR activities. Details of the activities to be undertaken shall be submitted within one month along with road map for implementation.	Being complied The CSR activities undertaken for: 1. Infrastructure development in the villages, 2. Livelihood Enhancement and training, 3. Quality Education, 4. Community Health and 5. Promotion of Sports and Culture. Activities under Poshan Maah also executed in neighbouring villages. Two community shed constructed in two villages. The activities carried earlier are being monitored and sustained by the beneficiaries. The CSR report for the period April to September 2021 is attached as Annexure – IV .
xxiii	While identifying 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	Need Assessment Study conducted and submitted with previous compliance report Income generating activities consists of poultry farming, mushroom production, vegetable cultivation, dairy farming, cross breeding of non-descriptive cattle, grocery

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Sr. No.	EC Conditions	Compliance Status
	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.	shops etc. Three cooperative societies formed for income generation named Surbhi Dugdh Utpadan Samiti, Gram Vikas Kamgar Samiti and Mahanadi Gramin Mahila Bahudesiye Sahkari Samiti. These cooperative societies are functional and members are having income out of it. Executed MOA under PPP for up-gradation of ITI Saria, Raigarh district, constituted IMC. Conducted clean drive, rallies, street plays, poster competition, rangoli competition under Swachhta Abhiyan at ITI Saria. Also conducted safety awareness program to the ITI students. The CSR report for the period April to September 2021 is attached as Annexure – IV.
xxiv	It shall be ensured that in-built monitoring mechanism for the schemes identified is in place and annual social audit shall be got done from the nearest government institute of repute in the region. The project proponent shall also submit the status of implementation of the scheme from time to time.	Complied. Social audit has been carried out by reputed institute IISWBM , Kolkata. Audit report already submitted with previous compliance reports.
xxv	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.	Being complied. Solar geysers are installed in roof top of residential complexes within plant premises.
xxvi	A long term study on radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter mechanism for an in-built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	Compliance assured. The work for carrying out radioactive analysis was carried out by Board of Radiation and Isotope Technology, Department of Atomic Energy, Govt. of India. However, the plant was under breakdown since 22 nd May'2017 to Dec'2019. Analysis report already submitted.
xxvii	Mercury emissions shall also be monitored on periodic basis.	Analytical report for Mercury emission monitoring from stack is enclosed as Annexure – I.
xxix	Fly ash shall not be used for agricultural purpose. No mine void filling will be	Noted,

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Sr. No.	EC Conditions	Compliance Status
	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, proper 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.	Compliance assured if the activity is undertaken.
xxx	Green Belt shall also be developed around the ash pond over and above the Green Belt around the plant boundary.	Being Complied Green belt / plantation is being developed. Approximate 209,772 trees have been planted. Local plant species being preferred for the plantation as fast growing with thick canopy cover adequate height with longer duration of foliage, Perennial and evergreen along with fruit bearing plants in adequate have also been planted. Greenbelt development plan has been approved by DFO. Greenbelt development status is enclosed as <u>Annexure - III.</u>
xxxi	An Environmental Cell comprising of at least one expert in environmental science/ engineering, ecology, occupational health and social science, shall be created preferably at the project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement/ mitigation measures.	Noted & Complied. We have already established an Environmental Management Cell headed by Senior Management at Corporate office and at Plant site Manager & supported by Environmental Engineer, Officer, Chemist & Horticulturist
xxxii	The project proponent shall formulate a well laid Corporate Environmental Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and	Noted. Complied

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Sr. No.	EC Conditions	Compliance Status
	compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.	
B. GENERAL CONDITIONS		
i	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.	Being Complied. ETP has been established to treat effluents and treated water is being reuse within the premises. The concept of "Zero Discharge Condition" is implemented. Separate drainage network is established for storm water. Effluent water quality report is enclosed as Annexure - I.
ii	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation.	Sewage Treatment Plants has been installed and the treated effluent is being used for plantation/greenbelt. Analysis report of STP is enclosed as Annexure - I.
iii	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.	A rainwater harvesting & recharging system has already been constructed. 08 nos. of rainwater harvesting ponds have been constructed within premises.
iv	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.	Adequate safety personnel's are available in the plant site to take preventive control measures. Fire hydrant system provided for prevention of spontaneous fires in coal yard, especially during summer season. Emergency preparedness plan is submitted at respective authorities.
v	Storage facilities for auxiliary liquid fuel such as LDO and/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.	The fuel such as LDO and HFO are properly stored in minimum risk area & in consultation with Department of Explosives, Nagpur after getting NOC for the same. Disaster management plan (DMP) has been prepared to handle the any eventuality in case of an accident taking place due to storage of oil.

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Sr. No.	EC Conditions	Compliance Status
vi	Regular monitoring of ground water level shall be carried out by establishing a network of existing wells and constructing new piezometers. Monitoring around the ash pond area shall be carried out particularly for heavy metals (Hg, Cr, As, Pb) and records maintained and submitted to the Regional Office of this Ministry. The data so obtained should be compared with the baseline data so as to ensure that the ground water quality is not adversely affected due to the project.	Peizometric wells are installed within the premises. Ground water analysis results are enclosed as Annexure - I.
vii	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.	The surface water samples being collected and analysis report is enclosed as Annexure - I.
viii	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	First aid and sanitation for labours was provided during the construction.
ix	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.	Necessary action has been taken to maintain noise levels in work zone area within 75 dB (A) from source during the plant operation. The personal protective equipment's (PPE) are provided to workers & employees working in noisy areas. Noise level monitoring is carried out regularly. Periodic audiometric check-up is being carried out.
x	Regular monitoring of ground level concentration of SO ₂ , NO _x , 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	Regular monitoring of SO ₂ , NO _x , PM _{2.5} & PM ₁₀ CO and Hg is being carried and records are being maintained during construction phase as well as operational phase. Environmental monitoring report is enclosed as Annexure - I.

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Sr. No.	EC Conditions	Compliance Status
	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.	Three online Continuous Ambient Air Quality Monitoring Station (CAAQM) System and one mobile Van for Ambient Air Quality Monitoring have been established within plant premise in consultation with Regional Office, Chhattisgarh Environment Conservation Board, Raigarh.
xi	Provision shall be made for the housing of construction labour (as applicable) within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Complied. All necessary facilities were provided during construction for contractual labours.
xii	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in .	Complied. Advertised in three newspapers Hindustan Times, Dainik bhaskar & Nai Duniya on 28.02.2010
xiii	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/ representations, if any, received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Complied. Copy of Environment Clearance has been provided to concerned authority. Previous compliance status updated in company website. http://www.adanipower.com
xiv	A separate Environment Management Cell with qualified staff shall be set up for	Being Complied. We have already established an Environment Management Cell with well qualified staff for

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Sr. No.	EC Conditions	Compliance Status
	implementation of the stipulated environmental safeguards.	implementation of the stipulated environmental safeguards.
xv	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; SPM, RSPM (PM _{2.5} & PM ₁₀), SO ₂ , NO _x (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.	Being Complied. Regular Environmental Monitoring report is being submitted to Regional office, MoEF, CPCB and CECB, Chhattisgarh. The environmental parameters display board provided at main gate of the plant. Previous compliance status was updated in company website. http://www.adanipower.com
xvi	The environment statement for each financial year ending 31 st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.	The Environment Statement for the year 2020-21 has been submitted to Chhattisgarh Environment Conservation Board (CECB) vide letter no. Ref. No.: REGL/ENV/20-21/ 146, dated-28/09/2021. Copy of Environmental statement report was submitted with previous EC Compliance report.
xvii	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environment of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests.	Being Complied. Six monthly Environmental Clearance compliance status report is regularly submitted to MoEF, CPCB and SPCB. The same is sent by email also. Last compliance report for the period of October'20 to March'21 had been submitted to your good office via our latter no. APL/REGL/TPP/EMD/MoEF/EC/188/21 dated-28.05.2021.

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Sr. No.	EC Conditions	Compliance Status
xviii	Regional Office of the Ministry of Environment & Forests will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring. Project proponent will up-load the compliance status in their website and up-date the same from time to time at least six monthly basis. Criteria pollutants levels including NOx (from stack & ambient air) shall be displayed at the main gate of the power plant.	Complied
Xix	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.	Being Complied A separate fund has already been allocated for implementation of environmental protection.
Xx	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.	Complied.
Xxi	Full cooperation shall be extended to the Scientists/Officers from the Ministry / Regional Office of the Ministry at Bangalore / CPCB/ SPCB who would be monitoring the compliance of environmental status.	Noted, Full co-operation shall be extended to all concerned authorities.
Conditions of EC Amendment Letter		
I	The coal shall be transported on road through mechanically covered trucks.	Noted.

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Sr. No.	EC Conditions	Compliance Status
		The vehicles are engaged for coal transporting are mechanically covered and periodic refresher training is also being imparted on traffic for safety and environment rules.
ii	Avenue plantation of 2/3 rows all along the road for transportation of coal shall be carried out by the project proponent at its own expenses in consultation with the State Government Authorities.	Agreed The joint inspection of coal transportation route has been carried out with by Van Vikas Nigam (Govt. of Chhattisgarh). Agency has given a preliminary proposal for plantation in available avenue of around 10 km out of 50 km. The proposal is under scrutiny and finalization for execution.
lii	Periodic maintenance of the roads used for transportation of coal shall be carried out by the project proponent at its own expenses and shall also facilitate the traffic control on the roads in consultation with State Government Authorities.	Noted & agreed The proposed coal transportation road has been recently constructed by NHAI, therefore no maintenance is required. Traffic vigilance and controls are provided as and when required by state authorities.

EC amendment – MoEF&CC notification vide letter number S.O. 1561 (E) dated 21st May, 2020		
Sl. No.	Condition of Notification	Compliance Status
1)	Setting up technology solution for emission norms i) Compliance of specified emission norms for Particulate Matter, as per extent notifications and instructions of Central Pollution Control Board, issued from time to time. ii) In case of washeries, middling and rejects to be utilized in FBC (Fluidised Bed Combustion) technology based thermal power plant. Washery to have linkage for middling and rejects in Fluidised Bed Combustion plants.	Noted. i) Technology solutions are being implemented for mitigating fugitive emissions of Particulate Matter. ii) Washeries, middling and rejects are not applicable for this Thermal Power Plant.
2)	Management of Ash Ponds i) The thermal power plants shall comply with conditions, as notified in the Fly Ash notifications issued from time to time, without being entitled to additional capacity of fly ash pond (for existing power generation capacity) on ground of switching from washed coal to unwashed coal.	i) Noted & being complied. Fly ash is disposed to nearby stone quarry and being supplied to brick manufacturer. Fly Ash generation and utilization is regularly submitted to CEA, New Delhi and the same is attached as Annexure II

Raigarh Energy Generation Limited
(1x600 MW Coal Based Thermal Power Plant)

	<p>ii) Appropriate Technology solutions shall be applied to optimise water consumption for Ash management.</p> <p>iii) The segregation of ash may be done at the Electro- Static Precipitator stage, if required, based on site specific conditions, to ensure maximum utilisation of fly ash</p> <p>iv) Subject to 2(i) above, the thermal power plants to dispose fly ash in abandoned or working mines (to be facilitated by mine owner) with environmental safeguards.</p>	<p>ii) Water requirement is being restricted to 15 MCM. Optimization of water has been incorporated as part of plant design and COC is being maintained more than 5.0</p> <p>iii) Noted & being complied</p> <p>iv) Noted & will be complied as & when fly ash is disposed in abandoned or working mines</p>
3)	<p>Transportation</p> <p>i) Coal transportation may be undertaken by covered Railway wagon (railway wagons covered by tarpaulin or other means) and/or covered conveyor beyond the mine area. However, till such time enabling Rail transport/conveyer beyond infrastructure is not available, road transportation may be undertaken in trucks, covered by tarpaulin or other means.</p> <p>ii) It shall be ensured by the thermal power plant that</p> <p>a) Rail siding facility or conveyer facility is set up at or near the power plant, for transportation by rail or conveyor; and</p> <p>b) If transportation by rail or conveyor facility is not available, ensure that the coal is transported out from the Delivery Point of the respective mine in covered trucks (by tarpaulin or other means), or any mechanized closed trucks by roads.</p>	<p>i) We have taken EC amendment for the Coal transportation by road, till the time railway line will be constructed/ commission.</p> <p>ii) Currently, we are transporting coal by road in tarpaulin covered truck.</p> <p>a) Coal is being unloaded at Vimla siding nearby Bhudevpur railway station in Raigarh district.</p> <p>b) Coal is being transported by tarpaulin covered truck from off-take site from being supplied Vimla siding as well as other market purchasing.</p>

1st Quarterly Environmental Monitoring Report



Submitted To:

**M/s Raigarh Energy Generation Ltd.
Village Chhote Bhandar, Post office Bade Bhandar,
Tehsil Pussore, Dist.-Raigarh -496100 (Chhattisgarh)**

Conducted by:

**M/s Vardan EnviroLab
Plot no. 82A, Sector-5, IMT Manesar, Gurugram (Haryana)**

(Recognized by MoEF & CC, NABL Government of India)

PREFACE

The growing concern for environmental protection and the passing of various environmental legislations have increased the responsibilities of Ministry of Environment, Forests & Climate Change, Pollution Control boards in many folds. Besides enforcing the various environmental legislations MoEF&CC, CPCB & SPCB strive to propagate the necessity awareness regarding the various legal provisions and environmental protection measures in the country.

Electric Power scenario has occupied a significant place in the development program of the country. Development and environment can neither be separated nor ignored. In fact, they are complimentary to each other. These issues have become a concern of the community, particularly the environment impact due to industries in the developing countries.

However, the prerequisite for sustainable development is judicious planning of environmental status, likely impacts of the approach adopted on the environment including inhabitants of the locality, availability of the eco-friendly technology, emerging waste disposal and waste utilization processes, techniques of land reclamation for the restoration of aesthetic beauty and soon.

M/s Raigarh Energy Generation Ltd., Village Chhote Bhandar, Post Office Bade Bhandar, Raigarh-496100, India, has engaged **M/S Vardan EnviroLab, Gurugram, (HR)** to provide Environmental Services in respect of ambient air quality monitoring, stack emission, noise level monitoring & Sampling and Analysis of ground water quality, surface water quality, treated effluent sewage, effluent water from ETP, and soil for **Raigarh Energy Generation Ltd., Raigarh district of Chhattisgarh**, as per guidelines of MoEF & CC and CPCB Gazette notification.

M/S Vardan EnviroLab, Gurugram, (HR) has deployed entirely its own personnel, facilities and expertise for doing this service. Sampling / Monitoring Stations were identified by the Environmental Officer of Raigarh Energy Generation Ltd., The samples were analyzed **partly** at site and partly at our MoEF Recognized laboratory situated at Gurugram (HR).

This report presents the data generated for the period from 25th June 2021 to 29th June 2021, i.e. for **First quarter which** includes sampling locations, Methodology, testing procedure and compilation for the Environmental parameters i.e. Air, Water & Noise with a view to evaluate the impact due to the thermal power plant activities.

During the course of our operations for the above task, the staff and management of Raigarh Energy Generation Ltd., were extremely co-operative. We are grateful to them for their invaluable support and assistance rendered to us during the course of the sampling and monitoring.

Date :

7/7/2021



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Chapter – 1.0

INTRODUCTION

M/s Raigarh Energy Generation Ltd., a subsidiary of Adani Power, is a power generation company based at Raigarh in the State of Chhattisgarh. On 07-Sep-2019, “Adani Power Limited” got approval from NCLT to become new owner of this project “Raigarh Energy Generation Ltd.”, has commissioned its Thermal Power Plant first 600MW Unit at Village Chhote Bhandar, Post Office Bade Bhandar, Raigarh- 496100, India. The second unit of 600MW is under implementation.

Raigarh Energy Generation Ltd., is also committed towards the environment and the community it operates in. It has successfully implemented several community welfare schemes in the field of livelihood, infrastructure, community health and education which has so far benefited over 60,000 people from close to 75 villages.



Figure No.1. Raigarh Energy Generation Ltd.

Chapter – 2.0

PROJECT PROFILE

2.1 Topography & Drainage

Topography of this area is generally undulating. The area is drained by Mand River approximately 3 km. away from plant in North direction and Mahanadi River approximately 5 km. away from plant in South direction.

2.2 Location

Plant is bounded by Northern Latitudes of 21° 44' 00" to 21° 44' 42" and Eastern Longitude of 83° 16' 30" to 83° 17' 18". This area falls in the survey of India toposheet no. 64 O/1, 64 O/2, 64 O/5 and 64 O/6. The location of the mine area is shown in **Fig. No. 2**

2.3 Climate

The climate of the area is Sub-tropical type. It is in the zone of humid tropic climate where temperature and humidity of air are very high. The temperature varies from the minimum - maximum temperature range between 29.5°C - 49 °C in summer, and 8°C - 25 °C in winter. The humidity varies from 35% to 82%. The annual average rainfall in the area is about 1300 mm.

2.4 Communication

The nearest railway station is Kirodimal, which is at a distance of ~23 Km towards North direction. The area is well connected with N.H. No. 216. Nearest Airport is Raipur ~250 km in SW direction. Nearest village is Bade Bhandar ~ 1 km. in North direction and nearest town is Raigarh ~21 km. in North-East direction.

2.5 Location Map

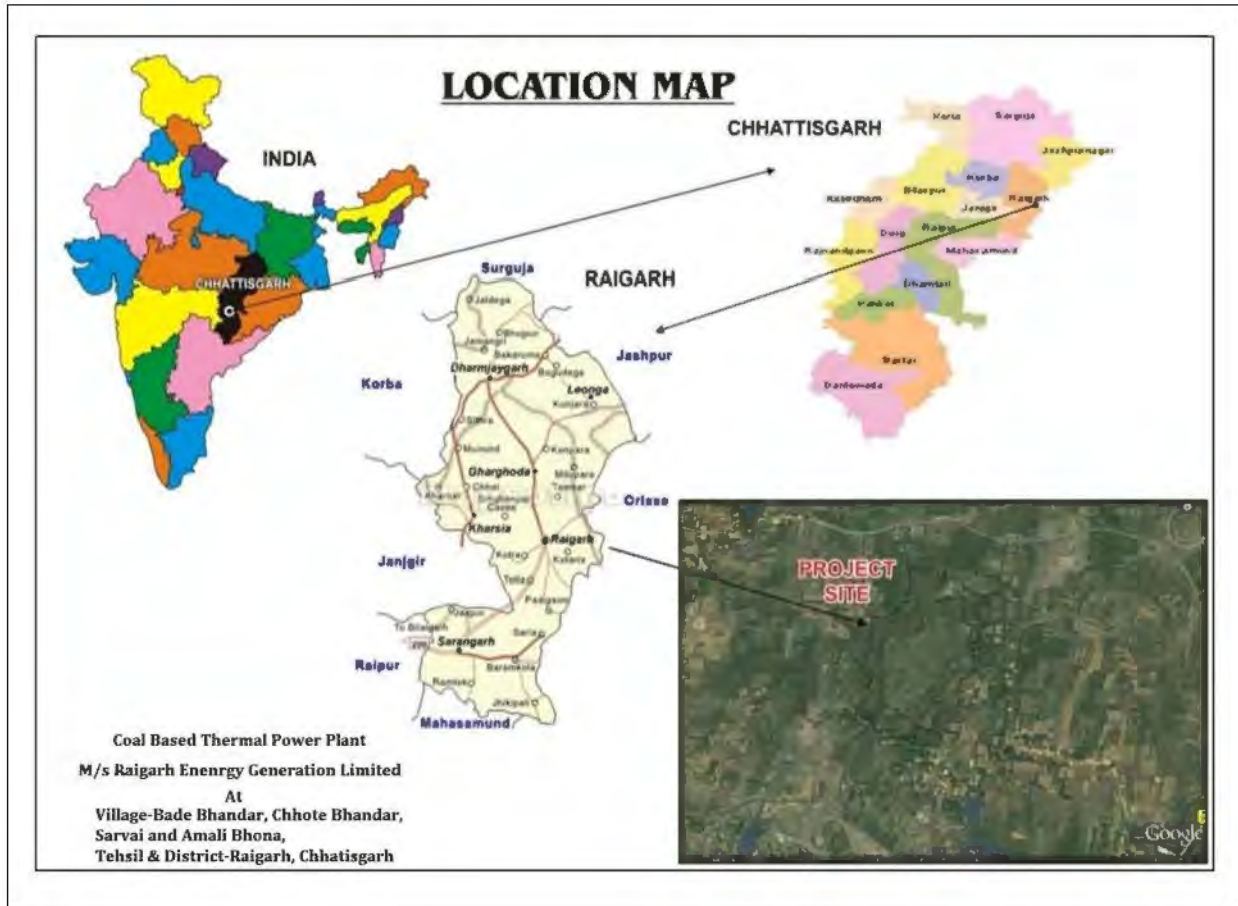


Figure No.2. Location Map

Chapter – 3.0

SCOPE OF STUDY AND METHODOLOGY

3.1 Scope of Study

The scope of study includes Environmental Services in respect of ambient air quality monitoring, noise level monitoring & Sampling and Analysis of ground water quality, surface water quality, treated effluent sewage, effluent water from ETP and soil.

3.2 Methodology

As mentioned in the scope of work covering the various Environmental components monitoring and sampling and its analysis was carried out on the basis of guidelines of Ministry of Environment Forest & Climate Control of Government of India & Chhattisgarh State Pollution Control Board. Sampling procedure method reference and Analysis procedure method reference are mentioned in monitoring reports.

3.2.1 Ambient Air Quality Monitoring

The ambient air quality has been carried out at various sources of air pollution surrounding and in the Plant. The prime objective of the ambient air quality monitoring is to assess the existing air quality of the area.

The ambient air quality monitoring was carried out for 24 hours at each station. At all stations SO₂, NO₂, PM₁₀, PM_{2.5}, CO and Mercury were monitored. All the samples collected were analyzed for quantitative analysis of various pollutants.

The ambient air quality sampling locations were identified by the Environmental Officer of Raigarh Energy Generation Ltd.

3.2.2 Water Environment

The ground water samples, surface water samples were collected from selected locations in two liter sterilized plastic cans. These samples were analyzed as per IS 10500:2012. The domestic effluent and Industrial effluent samples were collected and analyzed for parameters: pH, Total suspended solids, Biochemical Oxygen Demand, Chemical Oxygen Demand and Oil & Grease.

3.2.3 Noise Environment

Sound level meter was used to know the sound levels generated due to plant activities at different locations. The measurements were taken for Equivalent sound level over a time period for day and night which is expressed in dB(A).

3.2.4 Soil

The Soil samples were collected from selected locations. These samples were analyzed for Physico-Chemical parameters including heavy metals.

Chapter – 4.0

SAMPLING LOCATION MAP AND ANALYSIS REPORTS

4.1 Ambient Air Quality Monitoring



Figure No.3. Plan Showing Ambient Air Quality Location Map

- Location Code: -
- A1- Site Office
 - A2- PalsadaVillage
 - A3- Kathali Village
 - A4- Chhote Bhandar Village
 - A5- Bade Bhandar Village
 - A6- Kondataral Village
 - A7-Chatamura Chowk
 - A8- Supa, Near REGL Plant
 - A9- Near Main Gate



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/01 Report No.: VEL/A/2107020001
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh) Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 07/07/2021
Period of Analysis: 02-07/07/2021
Receipt Date: 02/07/2021
Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Kondataral
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/03
Instrument Calibration Status : Calibrated
Latitude : 21°51'52"
Longitude : 83°22'44"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 25/06/2021 to 26/06/2021
Time of Sampling : 10:10 AM to 10:10 AM
Ambient Temperature (°C) : Min. 28°C, Max. 39 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	*IS: 5182 (P-24), 2019	35.16	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	74.68	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	18.24	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	10.14	µg/m ³	80
5.	Ozone (as O ₃)	IS:51 82 (P- 9)-1974, RA. 2014	8.42	µg/m ³	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m ³	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	174.36	µg/m ³	600

Note :-*BDL-Below Detection Limit,**DL-Detection Limit.

(Checked By)

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Test Report

Sample Number: VEL/REGL/AA/02 Report No.: VEL/A/2107020002
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh) Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 07/07/2021
Period of Analysis: 02-07/07/2021
Receipt Date: 02/07/2021
Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Chatamura Chowk
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude : 21°51'52"
Longitude : 83°22'44"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 25/06/2021 to 26/06/2021
Time of Sampling : 10:30 AM to 10:30 AM
Ambient Temperature (°C) : Min. 28°C, Max. 39 °C
Surrounding Activity : Human, Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	*IS: 5182 (P-24), 2019	40.26	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	78.64	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	22.48	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	10.98	µg/m ³	80
5.	Ozone (as O ₃)	IS:51 82 (P- 9)-1974, RA. 2014	16.22	µg/m ³	180
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3 rd 1988, Method No.317	BDL(*DL-1.0)	ng/m ³	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	268.0	µg/m ³	600

Note :-*BDL-Below Detecation Limit ,**DL-Detecation Limit.

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Test Report

Sample Number: VEL/REGL/AA/03
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)
Report No.: VEL/A/2107020003
Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 07/07/2021
Period of Analysis: 02-07/07/2021
Receipt Date: 02/07/2021

Sample Description : Ambient Air Quality Monitoring

General Information:-

Sampling Location : Supa, Near REGL Plant
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude : 21°45'8"
Longitude : 83°18'4"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 25/06/2021 to 26/06/2021
Time of Sampling : 11.20 AM to 11:20 AM
Ambient Temperature (°C) : Min. 28°C, Max. 39 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	*IS: 5182 (P-24), 2019	33.18	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	72.26	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	20.54	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	12.29	µg/m ³	80
5.	Ozone (as O ₃)	IS:51 82 (P- 9)-1974, RA. 2014	8.21	µg/m ³	180
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3 rd 1988, Method No.317	BDL(DL-1.0)	ng/m ³	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	178.26	µg/m ³	600

Note :- *BDL- Below Detection Limit, **DL-Detection Limit.

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Test Report

Sample Number: VEL/REGL/AA/04 Report No.: VEL/A/2107020004
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh) Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 07/07/2021
Period of Analysis: 02-07/07/2021
Receipt Date: 02/07/2021
Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Site Office
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude : 21°44'27"
Longitude : 83°16'32"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 26/06/2021 to 27/06/2021
Time of Sampling : 10:15 AM to 10:15 AM
Ambient Temperature (°C) : Min. 27°C, Max. 38 °C
Surrounding Activity : Human, Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	*IS: 5182 (P-24), 2019	36.78	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	76.12	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	22.96	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:5182 (P- 2)-2001, RA. 2017	15.31	µg/m ³	80
5.	Carbon Monoxide (as CO)	CO By Analyzer	0.48	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3 rd 1988, Method No.317	BDL(*DL-1.0)	ng/m ³	--

Note :- *BDL-Below Detection Limit, **DL-Detection Limit.

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Test Report

Sample Number: VEL/REGL/AA/05 Report No.: VEL/A/2107020005
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh) Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 07/07/2021
Period of Analysis: 02-07/07/2021
Sample Description: Ambient Air Quality Monitoring Receipt Date: 02/07/2021

General Information:-

Sampling Location : Village - Palsada
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude : 21°44'13"
Longitude : 83°16'30"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 27/06/2021 to 28/06/2021
Time of Sampling : 10:30 AM to 10:30 AM
Ambient Temperature (°C) : Min. 27°C, Max. 38 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	*IS: 5182 (P-24), 2019	34.12	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	71.60	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	21.84	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:5182 (P- 2)-2001, RA. 2017	13.68	µg/m ³	80
5.	Carbon Monoxide (as CO)	CO By Analyzer	0.68	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3 rd 1988, Method No.317	BDL(*DL-1.0)	ng/m ³	--

Note :-*BDL-Below Detection Limit, **DL-Detection Limit.

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/06 Report No.: VEL/A/2107020006
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh) Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 07/07/2021
Period of Analysis: 02-07/07/2021
Receipt Date: 02/07/2021
Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Kathli
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude : 21°44'17"
Longitude : 83°16'19"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 27/06/2021 to 28/06/2021
Time of Sampling : 11:00 AM to 11:00 AM
Ambient Temperature (°C) : Min. 27°C, Max. 38 °C
Surrounding Activity : Human, Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	*IS: 5182 (P-24), 2019	40.31	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	76.59	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	22.34	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	16.48	µg/m ³	80
5.	Carbon Monoxide (as CO)	CO By Analyzer	0.76	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3 rd 1988, Method No.317	BDL(*DL -1.0)	ng/m ³	--

Note :- *BDL-Below Detection Limit, **DL-Detection Limit.

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ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/07 Report No.: VEL/A/2107020007
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh) Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 07/07/2021
Period of Analysis: 02-07/07/2021
Receipt Date: 02/07/2021

Sample Description : Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Chhote Bhandar
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude : 21°44'22"
Longitude : 83°16'43"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 28/06/2021 to 29/06/2021
Time of Sampling : 10:20 AM to 10:20 AM
Ambient Temperature (°C) : Min. 27°C, Max. 38 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	*IS: 5182 (P-24), 2019	36.51	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	75.84	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	20.42	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	12.80	µg/m ³	80
5.	Carbon Monoxide (as CO)	CO By Analyzer	0.74	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3 rd 1988,Method No.317	BDL(*DL-1.0)	ng/m ³	--

Note :-*BDL-Below Detection Limit,**DL-Detection Limit.

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Test Report

Sample Number: VEL/REGL/AA/08 Report No.: VEL/A/2107020008
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh) Format No.: 7.B F 01
Party Reference No.: NIL
Report Date: 07/07/2021
Period of Analysis: 02-07/07/2021
Receipt Date: 02/07/2021

Sample Description : Ambient Air Quality Monitoring

General Information:-

Sampling Location : Bade Bhandar
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/03
Instrument Calibration Status : Calibrated
Latitude : 21°44'29"
Longitude : 83°17'6"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 27/06/2021 to 28/06/2021
Time of Sampling : 11:20 AM to 11:20 AM
Ambient Temperature (°C) : Min. 27°C, Max. 38 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	*IS: 5182 (P-24), 2019	37.62	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	77.28	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	24.56	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:5182 (P- 2)-2001, RA. 2017	12.14	µg/m ³	80
5.	Carbon Monoxide (as CO)	CO By Analyzer	0.74	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3 rd 1988, Method No.317	BDL(DL-1.0)	ng/m ³	--

Note :- *BDL-Below Detection Limit, **DL-Detection Limit.

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Test Report

Sample Number: VEL/REGL/AA/10
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)
Report No.: VEL/A/2107020010
Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 07/07/2021
Period of Analysis: 02-07/07/2021
Receipt Date: 02/07/2021

Sample Description : Ambient Air Quality Monitoring

General Information:-

Sampling Location : Near Main Gate
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude : 21°51'52"
Longitude : 83°22'44"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 28/06/2021 to 29/06/2021
Time of Sampling : 10:10 AM to 10:10 AM
Ambient Temperature (°C) : Min. 28°C, Max. 39 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	#IS: 5182 (P-24), 2019	38.24	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	72.46	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	19.15	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	11.98	µg/m ³	80
5.	Ozone (as O ₃)	IS:51 82 (P- 9)-1974, RA. 2014	12.58	µg/m ³	180
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3 rd 1988, Method No.317	BDL(*DL-1.0)	ng/m ³	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	220.14	µg/m ³	600

Note :-*BDL-Below Detection Limit,**DL-Detection Limit.

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4.2 Noise Level Monitoring



Figure No.4. Plan Showing Noise Level Monitoring Location Map

Ambient Noise Level Monitoring Locations

- Location Code: -
- N1- PalsadaVillage
 - N2- Kathali Village
 - N3- Chote Bhandar Village
 - N4- Bade Bhandar Village



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Test Report

Sample Number:	VEL/REGL/AN/01	Report No.:	VEL/N/2107020001
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	07/07/2021
Protocol Used:	IS 9989: IS 9876	Receipt Date:	02/07/2021
Instrument Used	SLM	Sampling Duration	24 Hrs"
		Sample Collected by	VEL Team
		Instrument Calibration Status	Calibrated

Ambient Noise Level Monitoring Results

General Information:-

Sampling Location	: Village- Bade Bhandar
Instrument Code	: VEL/JAI/SLM/06
Meteorological condition during monitoring	: Clear sky
Date of Monitoring	: 27/06/2021 to 28/06/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 27°C, Max. 38 °C
Surrounding Activity	: Human, Vehicular & Plant Activities
Parameter Required	: As per Work Order

Sl.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	65.2	54.7
2.	M min	IS:9989,IS9876:1981	41.8	38.1
3.	Leq	IS:9989,IS9876:1981	55.63	43.51

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeakers and bursting of crackers is banned in these zones.
Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply

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Test Report

Sample Number:	VEL/REGL/AN/02	Report No.:	VEL/N/2107020002
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	07/07/2021
Protocol Used:	IS 9989: IS 9876	Receipt Date:	02/07/2021
Instrument Used	SLM	Sampling Duration	24 Hrs"
		Sample Collected by	VEL Team
		Instrument	
		Calibration Status	Calibrated

Ambient Noise Level Monitoring Results

General Information:-

Sampling Location	: Village- Palsada
Instrument Code	: VEL/JAI/SLM/06
Meteorological condition during monitoring	: Clear sky
Date of Monitoring	: 25/06/2021 to 26/06/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 26°C, Max. 36 °C
Surrounding Activity	: Human, Vehicular & Plant Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
4.	L max	IS:9989,IS9876:1981	64.2	56.3
5.	M min	IS:9989,IS9876:1981	42.7	39.7
6.	Leq	IS:9989,IS9876:1981	53.87	44.58

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

4. Day Time is from 6.00 AM to 10.00 PM.
 5. Night Time is reckoned between 10.00 PM to 6.00 AM.
 6. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeakers and bursting of crackers is banned in these zones.
- Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply

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Test Report

Sample Number:	VEL/REGL/AN/03	Report No.:	VEL/N/2107020003
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - ChhoteBhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	07/07/2021
Protocol Used:	IS 9989: IS 9876	Receipt Date:	02/07/2021
Instrument Used	SLM	Sampling Duration	24 Hrs"
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

Ambient Noise Level Monitoring Results

General Information:-

Sampling Location	: Kathli
Instrument Code	: VEL/JAI/SLM/06
Meteorological condition during monitoring	: Clear sky
Date of Monitoring	: 28/06/2021 to 29/06/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 27°C, Max. 38 °C
Surrounding Activity	: Human, Vehicular & Plant Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
7.	L max	IS:9989,IS9876:1981	68.5	55.6
8.	M min	IS:9989,IS9876:1981	44.3	40.2
9.	Leq	IS:9989,IS9876:1981	56.78	45.20

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

7. Day Time is from 6.00 AM to 10.00 PM.
8. Night Time is reckoned between 10.00 PM to 6.00 AM.
9. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeakers and bursting of crackers is banned in these zones.
Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply

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Test Report

Sample Number:	VEL/REGL/AN/04	Report No.:	VEL/N/2107020004
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	07/07/2021
Protocol Used:	IS 9989; IS 9876	Receipt Date:	02/07/2021
Instrument Used	SLM	Sampling Duration	24 Hrs"
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

Ambient Noise Level Monitoring Results

General Information:-

Sampling Location	: Chhote Bhandar
Instrument Code	: VEL/JAI/SLM/06
Meteorological condition during monitoring	: Clear sky
Date of Monitoring	: 26/06/2021 to 27/06/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 28°C, Max. 39 °C
Surrounding Activity	: Human, Vehicular & Plant Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
10.	L max	IS:9989,IS9876:1981	65.3	54.7
11.	M min	IS:9989,IS9876:1981	45.7	40.6
12.	Leq	IS:9989,IS9876:1981	55.36	45.87

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

10. Day Time is from 6.00 AM to 10.00 PM.

11. Night Time is reckoned between 10.00 PM to 6.00 AM.

12. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeakers and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply

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4.3 Ground water Quality Analysis



Figure No.5. Plan Showing Ground Water Quality Monitoring Location Map

Location Code: -

- GW1- Site Office
- GW2- PalsadaVillage
- GW3- Kathali Village
- GW4- Chote Bhandar Village
- GW5- Bade Bhandar Village



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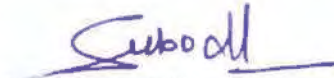
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
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Test Report

Sample Number:	VEL/REGL/W/02	Report No.:	VEL/W/2107020002
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	07/07/2021
Sample Description:	Ground Water	Period of Analysis:	02-07/07/2021
Sampling Location:	Village- Palsada	Receipt Date:	02/07/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	26/06/2021
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr
		Parameter Required:	As Per IS 10500-2012

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	IS 3025(P-11):1983:RA.2017	7.38	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025(P-4):1983:RA.2017	BDL(DL 1 Hazen)	Hazen	5	15
3.	Turbidity	IS 3025(P-10):1984:RA.2017	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	IS 3025(P-5):RA.2018	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025(P-8):1984:RA.2017	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025(P-21):2009:RA.2019	205.60	mg/l	200	600
7.	Calcium as Ca	IS 3025(P-40):1991:RA.2019	54.30	mg/l	75	200
8.	Alkalinity as CaCO ₃	IS 3025(P-23):1986:RA.2019	191.8	mg/l	200	600
9.	Chloride as Cl	IS 3025(P-32):1988:RA.2019	50.69	mg/l	250	1000
10.	Residual free Chlorine	IS 3025(P-26):1986:RA.2019	BDL(DL 0.15mg/l)	mg/l	0.2	1
11.	Total Ammonia	IS 3025(P-34):1988:RA.2019	BDL(DL 0.5mg/l)	mg/l	0.5	No Relaxation
12.	Magnesium as Mg	IS 3025(P-46):1994:RA.2019	17.04	mg/l	30	100
13.	Total Dissolved Solids	IS 3025(P-16):1984:RA.2017	328.0	mg/l	500	2000
14.	Sulphate as SO ₄	IS 3025(P-24):1986:RA.2019	28.38	mg/l	200	400


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Test Report

Sample No.: VEL/REGL/W/02			Report No.: VEL/W/2107020002			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 - 2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F-D	0.41	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	2.87	mg/l	45	No Relaxation
17.	Iron as Fe	IS 3025 (P-53)2003:RA.2019	0.14	mg/l	0.3	No relaxation
18.	Aluminium as Al	IS 3025 (P-55)2003:RA.2019	BDL(DL 0.002mg/l)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition,2017,4500-B	BDL(DL 0.01mg/l)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition,2017, 5530 C	BDL(DL 0.001mg/l)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.02mg/l)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02mg/l)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Edition 2017, 3030D,3112B	BDL(DL 0.01mg/l)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition 2017,3111B	BDL(DL 0.002mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-46) 1994:RA.2019	BDL(DL 0.01mg/l)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025(P-39)	BDL(DL 0.05mg/l)	mg/l	0.5	No relaxation
27.	Sulphide	IS 3025(p-29):1986, Reaffirmed:2019	BDL(DL 0.02mg/l)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01mg/l)	mg/l	0.7	No relaxation
29.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent/100ml	NA
31.	Fecal Coliform	IS:1622:2009	Absent	MPN/100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	No relaxation

Note:- *BDL-Below Detection Limit, *DL- Detection Limit

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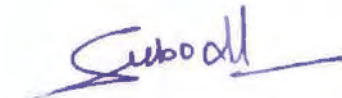
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/03	Report No.:	VEL/W/2107020003
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village -ChhoteBhandar,Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	07/07/2021
Sample Description:	Ground Water	Period of Analysis:	02-07/07/2021
Sampling Location:	Village-Kathli	Receipt Date:	02/07/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	26/06/2021
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr
		Parameter Required:	As Per IS 10500-2012

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	IS 3025(P-11):1983:RA.2017	7.28	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025(P-4):1983:RA.2017	BDL(DL 1 Hazen)	Hazen	5	15
3.	Turbidity	IS 3025(P-10):1984:RA.2017	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	IS 3025(P-5):RA.2018	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025(P-8):1984:RA.2017	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025(P-21):2009:RA.2019	252.20	mg/l	200	600
7.	Calcium as Ca	IS 3025(P-40):1991:RA.2019	71.80	mg/l	75	200
8.	Alkalinity as CaCO ₃	IS 3025(P-23):1986:RA.2019	248.90	mg/l	200	600
9.	Chloride as Cl	IS 3025(P-32):1988:RA.2019	69.13	mg/l	250	1000
10.	Residual free Chlorine	IS 3025(P-26):1986:RA.2019	BDL(DL 0.15mg/l)	mg/l	0.2	1
11.	Total Ammonia	IS 3025(P-34):1988:RA.2019	BDL(DL 0.5mg/l)	mg/l	0.5	No Relaxation
12.	Magnesium as Mg	IS 3025(P-46):1994:RA.2019	17.77	mg/l	30	100
13.	Total Dissolved Solids	IS 3025(P-16):1984:RA.2017	388.0	mg/l	500	2000
14.	Sulphate as SO ₄	IS 3025(P-24):1986:RA.2019	30.27	mg/l	200	400


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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/03			Report No.: VEL/W/2107020003			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 - 2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F-D	0.46	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	3.62	mg/l	45	No Relaxation
17.	Iron as Fe	IS 3025 (P-53)2003:RA.2019	0.12	mg/l	0.3	No relaxation
18.	Aluminium as Al	IS 3025 (P-55)2003:RA.2019	BDL(DL 0.002mg/l)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition,2017,4500-B	BDL(DL 0.01mg/l)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition,2017, 5530 C	BDL(DL 0.001mg/l)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.02mg/l)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02mg/l)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Edition 2017, 3030D,3112B	BDL(DL 0.01mg/l)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-46) 1994:RA.2019	BDL(DL 0.01mg/l)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025(P-39)	BDL(DL 0.05mg/l)	mg/l	0.5	No relaxation
27.	Sulphide	IS 3025(p-29):1986, Reaffirmed:2019	BDL(DL 0.02mg/l)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01mg/l)	mg/l	0.7	No relaxation
29.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent/100ml	NA
31.	Fecal Coliform	IS:1622:2009	Absent	MPN/100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	No relaxation

Note:- *BDL-Below Detection Limit, *DL- Detection Limit

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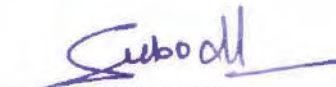
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/04	Report No.:	VEL/W/2107020004
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	07/07/2021
Sample Description:	Ground Water	Period of Analysis:	02-07/07/2021
Sampling Location:	Village-Chote Bhandar	Receipt Date:	02/07/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	26/06/2021
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr
		Parameter Required:	As Per IS 10500-2012

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	IS 3025(P-11):1983:RA.2017	7.54	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025(P-4):1983:RA.2017	BDL(DL 1 Hazen)	Hazen	5	15
3.	Turbidity	IS 3025(P-10):1984:RA.2017	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	IS 3025(P-5):RA.2018	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025(P-8):1984:RA.2017	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025(P-21):2009:RA.2019	263.80	mg/l	200	600
7.	Calcium as Ca	IS 3025(P-40):1991:RA.2019	77.60	mg/l	75	200
8.	Alkalinity as CaCO ₃	IS 3025(P-23):1986:RA.2019	236.60	mg/l	200	600
9.	Chloride as Cl	IS 3025(P-32):1988:RA.2019	73.74	mg/l	250	1000
10.	Residual free Chlorine	IS 3025(P-26):1986:RA.2019	BDL(DL 0.15mg/l)	mg/l	0.2	1
11.	Total Ammonia	IS 3025(P-34):1988:RA.2019	BDL(DL 0.5mg/l)	mg/l	0.5	No Relaxation
12.	Magnesium as Mg	IS 3025(P-46):1994:RA.2019	17.07	mg/l	30	100
13.	Total Dissolved Solids	IS 3025(P-16):1984:RA.2017	410.0	mg/l	500	2000
14.	Sulphate as SO ₄	IS 3025(P-24):1986:RA.2019	34.05	mg/l	200	400


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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/04				Report No.: VEL/W/2107020004		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 - 2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F-D	0.42	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	2.87	mg/l	45	No Relaxation
17.	Iron as Fe	IS 3025 (P-53)2003:RA.2019	0.10	mg/l	0.3	No relaxation
18.	Aluminium as Al	IS 3025 (P-55)2003:RA.2019	BDL(DL 0.002mg/l)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition,2017,4500-B	BDL(DL 0.01mg/l)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition,2017, 5530 C	BDL(DL 0.001mg/l)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.02mg/l)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02mg/l)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Edition 2017, 3030D,3112B	BDL(DL 0.01mg/l)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-46) 1994:RA.2019	BDL(DL 0.01mg/l)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025(P-39)	BDL(DL 0.05mg/l)	mg/l	0.5	No relaxation
27.	Sulphide	IS 3025(p-29):1986, Reaffirmed:2019	BDL(DL 0.02mg/l)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01mg/l)	mg/l	0.7	No relaxation
29.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent/100ml	NA
31.	Fecal Coliform	IS:1622:2009	Absent	MPN/100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	No relaxation

Note:- *BDL-Below Detection Limit, *DL- Detection Limit

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

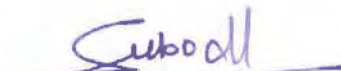
Test Report

Sample Number: **VEL/REGL/W/05** Report No.: **VEL/W/2107020005**
Name & Address of Party: **M/s Raigarh Energy Generation Ltd.
Village -ChhoteBhandar,Post Office Bade
Bade Bandar, Tehsil Pussore, Dist-
Raigarh
496100 (Chhattisgarh)** Format No.: **5.10 F-01**
Party Reference No.: **NIL**
Reporting Date: **07/07/2021**
Period of Analysis: **02-07/07/2021**
Receipt Date: **02/07/2021**
Sampling Date: **26/06/2021**
Sampling Type: **Grab**
Preservation: **Refrigerated**
Sampling Quantity: **2.0 Ltr**
Parameter Required: **As Per IS 10500-2012**

Sample Description: **Ground Water**
Sampling Location: **Village-BadeBhandar**
Sample Collected by: **Vardan EnviroLab Representative**
Sampling & Analysis Protocol: **IS-10500-2012**

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	IS 3025(P-11):1983:RA.2017	7.62	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025(P-4):1983:RA.2017	BDL(DL 1 Hazen)	Hazen	5	15
3.	Turbidity	IS 3025(P-10):1984:RA.2017	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	IS 3025(P-5):RA.2018	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025(P-8):1984:RA.2017	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025(P-21):2009:RA.2019	454.0	mg/l	200	600
7.	Calcium as Ca	IS 3025(P-40):1991:RA.2019	75.70	mg/l	75	200
8.	Alkalinity as CaCO ₃	IS 3025(P-23):1986:RA.2019	195.80	mg/l	200	600
9.	Chloride as Cl	IS 3025(P-32):1988:RA.2019	73.74	mg/l	250	1000
10.	Residual free Chlorine	IS 3025(P-26):1986:RA.2019	BDL(DL 0.15mg/l)	mg/l	0.2	1
11.	Total Ammonia	IS 3025(P-34):1988:RA.2019	BDL(DL 0.5mg/l)	mg/l	0.5	No Relaxation
12.	Magnesium as Mg	IS 3025(P-46):1994:RA.2019	64.44	mg/l	30	100
13.	Total Dissolved Solids	IS 3025(P-16):1984:RA.2017	411.0	mg/l	500	2000
14.	Sulphate as SO ₄	IS 3025(P-24):1986:RA.2019	32.16	mg/l	200	400


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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/05				Report No.: VEL/W/2107020005		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 - 2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F-D	0.36	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	2.57	mg/l	45	No Relaxation
17.	Iron as Fe	IS 3025 (P-53)2003:RA.2019	0.21	mg/l	0.3	No relaxation
18.	Aluminium as Al	IS 3025 (P-55)2003:RA.2019	BDL(DL 0.002mg/l)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition,2017,4500-B	BDL(DL 0.01mg/l)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition,2017, 5530 C	BDL(DL 0.001mg/l)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.02mg/l)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02mg/l)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Edition 2017, 3030D,3112B	BDL(DL 0.01mg/l)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-46) 1994:RA.2019	BDL(DL 0.01mg/l)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025(P-39)	BDL(DL 0.05mg/l)	mg/l	0.5	No relaxation
27.	Sulphide	IS 3025(p-29):1986, Reaffirmed:2019	BDL(DL 0.02mg/l)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01mg/l)	mg/l	0.7	No relaxation
29.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent/100ml	NA
31.	Fecal Coliform	IS:1622:2009	Absent	MPN/100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	No relaxation

Note:- *BDL-Below Detection Limit, *DL- Detection Limit

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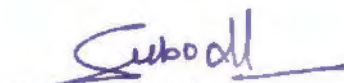
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/06	Report No.:	VEL/W/2107020006
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	07/07/2021
Sample Description:	Ground Water	Period of Analysis:	02-07/07/2021
Sampling Location:	Near Site Office	Receipt Date:	02/07/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	26/06/2021
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr
		Parameter Required:	As Per IS 10500-2012

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	IS 3025(P-11):1983:RA.2017	7.58	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025(P-4):1983:RA.2017	BDL(DL 1 Hazen)	Hazen	5	15
3.	Turbidity	IS 3025(P-10):1984:RA.2017	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	IS 3025(P-5):RA.2018	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025(P-8):1984:RA.2017	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025(P-21):2009:RA.2019	147.40	mg/l	200	600
7.	Calcium as Ca	IS 3025(P-40):1991:RA.2019	48.50	mg/l	75	200
8.	Alkalinity as CaCO ₃	IS 3025(P-23):1986:RA.2019	134.6	mg/l	200	600
9.	Chloride as Cl	IS 3025(P-32):1988:RA.2019	50.69	mg/l	250	1000
10.	Residual free Chlorine	IS 3025(P-26):1986:RA.2019	BDL(DL 0.15mg/l)	mg/l	0.2	1
11.	Total Ammonia	IS 3025(P-34):1988:RA.2019	BDL(DL 0.5mg/l)	mg/l	0.5	No Relaxation
12.	Magnesium as Mg	IS 3025(P-46):1994:RA.2019	6.42	mg/l	30	100
13.	Total Dissolved Solids	IS 3025(P-16):1984:RA.2017	278.0	mg/l	500	2000
14.	Sulphate as SO ₄	IS 3025(P-24):1986:RA.2019	18.92	mg/l	200	400


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ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/06			Report No.: VEL/W/2107020006			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 - 2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F-D	0.38	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	1.58	mg/l	45	No Relaxation
17.	Iron as Fe	IS 3025 (P-53)2003:RA.2019	0.16	mg/l	0.3	No relaxation
18.	Aluminium as Al	IS 3025 (P-55)2003:RA.2019	BDL(DL 0.002mg/l)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition,2017,4500-B	BDL(DL 0.01mg/l)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition,2017, 5530 C	BDL(DL 0.001mg/l)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.02mg/l)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02mg/l)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Edition 2017, 3030D,3112B	BDL(DL 0.01mg/l)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-46) 1994:RA.2019	BDL(DL 0.01mg/l)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025(P-39)	BDL(DL 0.05mg/l)	mg/l	0.5	No relaxation
27.	Sulphide	IS 3025(p-29):1986, Reaffirmed:2019	BDL(DL 0.02mg/l)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01mg/l)	mg/l	0.7	No relaxation
29.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent/100ml	NA
31.	Fecal Coliform	IS:1622:2009	Absent	MPN/100ml	Shall Not Be. detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.002mg/l)	mg/l	0.01	No relaxation

Note:- *BDL-Below Detection Limit, *DL- Detection Limit

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4.4 Surface water Quality Analysis



Figure. No. 6. Plan Showing Surface Water Quality Monitoring Location Map

Location Code: - 1. Mand Nadi River (Up Stream)

2. Mand Nadi River (Down Stream)



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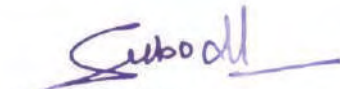
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: **VEL/REGL/W/11** Report No.: **VEL/W/2107020011**
Name & Address of Party: **M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office
Bade Bade Bandar, Tehsil Pussore, Dist-
Raigarh
496100 (Chhattisgarh)** Format No.: **5.10 F-01**
Party Reference No.: **NIL** Reporting Date: **07/07/2021**
Sample Description: **Surface Water** Period of Analysis: **02-07/07/2021**
Sampling Location: **Mand River (Down Stream)** Receipt Date: **02/07/2021**
Sample Collected by: **Vardan EnviroLab Representative** Sampling Date: **26/06/2021**
Sampling & Analysis Protocol: **IS-2296** Sampling Type: **Grab**
Preservation: **Refrigerated**
Sampling Quantity: **2.0 Ltr**

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025(P-11):1983:RA.2017	7.54	--
2.	Colour	IS 3025(P-4):1983:RA.2017	BDL(DL 1 Hazen)	Hazen
3.	Turbidity	IS 3025(P-10):1984:RA.2017	BDL (DL 1 NTU)	NTU
4.	Odour	IS 3025(P-5):RA.2018	Agreeable	--
5.	Taste	IS 3025(P-8):1984:RA.2017	Agreeable	--
6.	Total Hardness as CaCO ₃	IS 3025(P-21):2009:RA.2019	147.40	mg/l
7.	Calcium as Ca	IS 3025(P-40):1991:RA.2019	42.70	mg/l
8.	Alkalinity as CaCO ₃	IS 3025(P-23):1986:RA.2019	97.90	mg/l
9.	Chloride as Cl	IS 3025(P-32):1988:RA.2019	55.30	mg/l
10.	Residual free Chlorine	IS 3025(P-26):1986:RA.2019	BDL(DL 0.15mg/l)	mg/l
11.	Total Ammonia	IS 3025(P-34):1988:RA.2019	BDL(DL 0.5mg/l)	mg/l
12.	Magnesium as Mg	IS 3025(P-46):1994:RA.2019	9.95	mg/l
13.	Total Dissolved Solids	IS 3025(P-16):1984:RA.2017	245.0	mg/l
14.	Sulphate as SO ₄	IS 3025(P-24):1986:RA.2019	31.21	mg/l


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(Authorized Signatory)



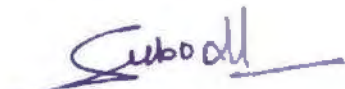
Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/11			Report No.: VEL/W/2107020011	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F D	0.26	mg/l
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	4.38	mg/l
17.	Iron as Fe	IS 3025 (P-53)2003:RA.2019	0.22	mg/l
18.	Aluminium as Al	IS 3025 (P-55)2003:RA.2019	BDL(DL 0.002mg/l)	mg/l
19.	Boron	APHA 23 rd Edition,2017,4500-B	0.34	mg/l
20.	Phenolic Compounds	APHA 23 rd Edition,2017, 5530 C	BDL(DL 0.001mg/l)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.02mg/l)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02mg/l)	mg/l
23.	Zinc as Zn	APHA 23 rd Edition 2017, 3030D,3112B	BDL(DL 0.01mg/l)	mg/l
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002mg/l)	mg/l
25.	Manganese as Mn	IS 3025 (P-46) 1994:RA.2019	BDL(DL 0.01mg/l)	mg/l
26.	Mineral Oil	IS 3025(P-39)	BDL(DL 0.05mg/l)	mg/l
27.	Sulphide	IS 3025(p-29):1986, Reaffirmed:2019	BDL(DL 0.02mg/l)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01mg/l)	mg/l
29.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	46.0	MPN/100ml
30.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml
31.	Fecal Coliform	IS:1622:2009	32.0	MPN/100ml
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002mg/l)	mg/l
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.002mg/l)	mg/l

Note: - *BDL-Below Detection Limit, *DL- Detection Limit


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(Authorized Signatory)



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/12	Report No.:	VEL/W/2107020012
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	07/07/2021
Sample Description:	Surface Water	Period of Analysis:	02-07/07/2021
Sampling Location:	Mand River (UP Stream)	Receipt Date:	02/07/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	26/06/2021
Sampling & Analysis Protocol:	IS-2296	Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr.

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025(P-11):1983:RA.2017	7.48	--
2.	Colour	IS 3025(P-4):1983:RA.2017	BDL(DL 1 Hazen)	Hazen
3.	Turbidity	IS 3025(P-10):1984:RA.2017	BDL (DL 1 NTU)	NTU
4.	Odour	IS 3025(P-5):RA.2018	Agreeable	--
5.	Taste	IS 3025(P-8):1984:RA.2017	Agreeable	--
6.	Total Hardness as CaCO ₃	IS 3025(P-21):2009:RA.2019	97.0	mg/l
7.	Calcium as Ca	IS 3025(P-40):1991:RA.2019	31.0	mg/l
8.	Alkalinity as CaCO ₃	IS 3025(P-23):1986:RA.2019	85.70	mg/l
9.	Chloride as Cl	IS 3025(P-32):1988:RA.2019	46.09	mg/l
10.	Residual free Chlorine	IS 3025(P-26):1986:RA.2019	BDL(DL 0.15mg/l)	mg/l
11.	Total Ammonia	IS 3025(P-34):1988:RA.2019	BDL(DL 0.5mg/l)	mg/l
12.	Magnesium as Mg	IS 3025(P-46):1994:RA.2019	4.75	mg/l
13.	Total Dissolved Solids	IS 3025(P-16):1984:RA.2017	190.0	mg/l
14.	Sulphate as SO ₄	IS 3025(P-24):1986:RA.2019	20.81	mg/l

(Checked By)

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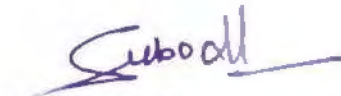
Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/12			Report No.: VEL/W/2107020012	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F-D	0.36	mg/l
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	4.51	mg/l
17.	Iron as Fe	IS 3025 (P-53)2003:RA.2019	0.21	mg/l
18.	Aluminium as Al	IS 3025 (P-55)2003:RA.2019	BDL(DL 0.002mg/l)	mg/l
19.	Boron	APHA 23 rd Edition,2017,4500-B	BDL(DL 0.01mg/l)	mg/l
20.	Phenolic Compounds	APHA 23 rd Edition,2017, 5530 C	BDL(DL 0.001mg/l)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.02mg/l)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02mg/l)	mg/l
23.	Zinc as Zn	APHA 23 rd Edition 2017, 3030D,3112B	BDL(DL 0.01mg/l)	mg/l
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002mg/l)	mg/l
25.	Manganese as Mn	IS 3025 (P-46) 1994:RA.2019	BDL(DL 0.01mg/l)	mg/l
26.	Mineral Oil	IS 3025(P-39)	BDL(DL 0.05mg/l)	mg/l
27.	Sulphide	IS 3025(p-29):1986, Reaffirmed:2019	2.28	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01mg/l)	mg/l
29.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	32.0	MPN/100ml
30.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml
31.	Fecal Coliform	IS:1622:2009	24.0	MPN/100ml
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002mg/l)	mg/l
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.002mg/l)	mg/l

Note: - *BDL-Below Detection Limit, *DL- Detection Limit


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Figure. No. 7. Plan Showing Surface Water Quality Monitoring Location Map



Location Code: - 1 Mahanadi River Up Stream

2 Mahanadi River down Stream



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: **VEL/REGL/W/13** Report No.: **VEL/W/2107020013**
Name & Address of Party: **M/s Raigarh Energy Generation Ltd.
Village -Chhote Bhandar, Post Office
Bade Bade Bandar, Tehsil Pussore, Dist-
Raigarh
496100 (Chhattisgarh)** Format No.: **5.10 F-01**
Party Reference No.: **NIL**
Reporting Date: **07/07/2021**
Period of Analysis: **02-07/07/2021**
Receipt Date: **02/07/2021**
Sampling Date: **26/06/2021**
Sampling Type: **Grab**
Preservation: **Refrigerated**
Sampling Quantity: **2.0 Ltr**

Sample Description: **Surface Water**
Sampling Location: **Mahanadi (Down Stream)**
Sample Collected by: **Vardan EnviroLab Representative**
Sampling & Analysis Protocol: **IS-2296**

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025(P-11):1983:RA.2017	7.46	--
2.	Colour	IS 3025(P-4):1983:RA.2017	BDL(DL 1 Hazen)	Hazen
3.	Turbidity	IS 3025(P-10):1984:RA.2017	BDL (DL 1 NTU)	NTU
4.	Odour	IS 3025(P-5):RA.2018	Agreeable	--
5.	Taste	IS 3025(P-8):1984:RA.2017	Agreeable	--
6.	Total Hardness as CaCO ₃	IS 3025(P-21):2009:RA.2019	147.40	mg/l
7.	Calcium as Ca	IS 3025(P-40):1991:RA.2019	44.60	mg/l
8.	Alkalinity as CaCO ₃	IS 3025(P-23):1986:RA.2019	118.30	mg/l
9.	Chloride as Cl	IS 3025(P-32):1988:RA.2019	55.30	mg/l
10.	Residual free Chlorine	IS 3025(P-26):1986:RA.2019	BDL(DL 0.15mg/l)	mg/l
11.	Total Ammonia	IS 3025(P-34):1988:RA.2019	BDL(DL 0.5mg/l)	mg/l
12.	Magnesium as Mg	IS 3025(P-46):1994:RA.2019	8.78	mg/l
13.	Total Dissolved Solids	IS 3025(P-16):1984:RA.2017	292.0	mg/l
14.	Sulphate as SO ₄	IS 3025(P-24):1986:RA.2019	38.78	mg/l

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(Authorized Signatory)



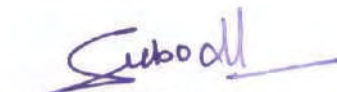
Vardan EnviroLab


Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/13			Report No.: VEL/W/2107020013	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F D	0.36	mg/l
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	7.40	mg/l
17.	Iron as Fe	IS 3025 (P-53)2003:RA.2019	0.24	mg/l
18.	Aluminium as Al	IS 3025 (P-55)2003:RA.2019	BDL(DL 0.002mg/l)	mg/l
19.	Boron	APHA 23 rd Edition,2017,4500-B	BDL(DL 0.01mg/l)	mg/l
20.	Phenolic Compounds	APHA 23 rd Edition,2017, 5530 C	BDL(DL 0.001mg/l)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.02mg/l)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02mg/l)	mg/l
23.	Zinc as Zn	APHA 23 rd Edition 2017, 3030D,3112B	BDL(DL 0.01mg/l)	mg/l
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002mg/l)	mg/l
25.	Manganese as Mn	IS 3025 (P-46) 1994:RA.2019	BDL(DL 0.01mg/l)	mg/l
26.	Mineral Oil	IS 3025(P-39)	BDL(DL 0.05mg/l)	mg/l
27.	Sulphide	IS 3025(p-29):1986, Reaffirmed:2019	BDL(DL 0.02mg/l)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01mg/l)	mg/l
29.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	64.0	MPN/100ml
30.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml
31.	Fecal Coliform	IS:1622:2009	48.0	MPN/100ml
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002mg/l)	mg/l
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.002mg/l)	mg/l

Note: - *BDL-Below Detection Limit, *DL- Detection Limit


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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

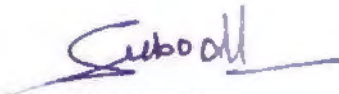
Test Report


Sample Number: **VEL/REGL/W/14** Report No.: **VEL/W/2107020014**
Name & Address of Party: **M/s Raigarh Energy Generation Ltd.
Village -Chhote Bhandar, Post Office
Bade Bade Bandar, Tehsil Pussore, Dist-
Raigarh
496100 (Chhattisgarh)** Format No.: **5.10 F-01**
Party Reference No.: **NIL**
Reporting Date: **07/07/2021**
Period of Analysis: **02-07/07/2021**
Receipt Date: **02/07/2021**
Sampling Date: **26/06/2021**
Sampling Type: **Grab**
Preservation: **Refrigerated**
Sampling Quantity: **2.0 Ltr**

Sample Description: **Surface Water**
Sampling Location: **Mahanadi (UP Stream)**
Sample Collected by: **Vardan EnviroLab Representative**
Sampling & Analysis Protocol: **IS-2296**

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025(P-11):1983:RA.2017	7.38	--
2.	Colour	IS 3025(P-4):1983:RA.2017	BDL(DL 1 Hazen)	Hazen
3.	Turbidity	IS 3025(P-10):1984:RA.2017	BDL (DL 1 NTU)	NTU
4.	Odour	IS 3025(P-5):RA.2018	Agreeable	--
5.	Taste	IS 3025(P-8):1984:RA.2017	Agreeable	--
6.	Total Hardness as CaCO ₃	IS 3025(P-21):2009:RA.2019	116.40	mg/l
7.	Calcium as Ca	IS 3025(P-40):1991:RA.2019	38.80	mg/l
8.	Alkalinity as CaCO ₃	IS 3025(P-23):1986:RA.2019	126.50	mg/l
9.	Chloride as Cl	IS 3025(P-32):1988:RA.2019	59.91	mg/l
10.	Residual free Chlorine	IS 3025(P-26):1986:RA.2019	BDL(DL 0.15mg/l)	mg/l
11.	Total Ammonia	IS 3025(P-34):1988:RA.2019	BDL(DL 0.5mg/l)	mg/l
12.	Magnesium as Mg	IS 3025(P-46):1994:RA.2019	4.76	mg/l
13.	Total Dissolved Solids	IS 3025(P-16):1984:RA.2017	250.0	mg/l
14.	Sulphate as SO ₄	IS 3025(P-24):1986:RA.2019	17.97	mg/l


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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/14			Report No.: VEL/W/2107020014	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F-D	0.25	mg/l
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	6.64	mg/l
17.	Iron as Fe	IS 3025 (P-53)2003:RA.2019	0.22	mg/l
18.	Aluminium as Al	IS 3025 (P-55)2003:RA.2019	BDL(DL 0.002mg/l)	mg/l
19.	Boron	APHA 23 rd Edition,2017,4500-B	BDL(DL 0.01mg/l)	mg/l
20.	Phenolic Compounds	APHA 23 rd Edition,2017, 5530 C	BDL(DL 0.001mg/l)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.02mg/l)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02mg/l)	mg/l
23.	Zinc as Zn	APHA 23 rd Edition 2017, 3030D,3112B	BDL(DL 0.01mg/l)	mg/l
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002mg/l)	mg/l
25.	Manganese as Mn	IS 3025 (P-46) 1994:RA.2019	BDL(DL 0.01mg/l)	mg/l
26.	Mineral Oil	IS 3025(P-39)	BDL(DL 0.05mg/l)	mg/l
27.	Sulphide	IS 3025(p-29):1986, Reaffirmed:2019	BDL(DL 0.02mg/l)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01mg/l)	mg/l
29.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	28.0	MPN/100ml
30.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml
31.	Fecal Coliform	IS:1622:2009	18.0	MPN/100ml
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002mg/l)	mg/l
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.002mg/l)	mg/l

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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4.5 Soil Quality Analysis



Figure No. 8. Plan Showing Soil Sample Monitoring Location Map

Location Code: -

- S1- PalsadaVillage
- S2- Kthali Village
- S3- Chote Bhandar Village
- S4- Bade Bhandar Village
- S5- Nursery



Vardan EnviroLab

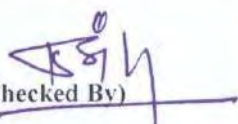
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ISO 9001 | ISO 14001 | ISO 45001

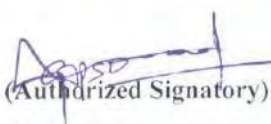
Test Report

Sample Number: **VEL/REGL/01** Report No.: **VEL/S0/2107020001**
Name & Address of the Project: **M/s Raigarh Energy Generation Ltd.
Village -Chhote Bhandar,Post Office Bade Bade
Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)** Format No.: **7.8 F-01**
Party Reference No.: **NIL** Reporting Date: **07/07/2021**
Receipt Date: **02/07/2021**
Sampling Date: **25/06/2021**
Type of Sampling: **Composite**
Sampling Quantity: **2.0 Kg**
Depth of Sampling: **30 cm**
Packing Status: **Temp Sealed**
Sample Description: **SOIL**
Sample Collected by: **Vardan EnviroLab Team**
Sampling Protocol: **IS 2720 & USDA**
Location: **Palsada**

Soil Quality Analysis Results

S.No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.68	--
2.	Conductivity	IS:14767:2000,RA:2016	0.344	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	36.12	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.32	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	96.24	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	326.54	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	88.64	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	110.32	(kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.66	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	86.34	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	206.26	(kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	32.48	(kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	16.24	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	126.84	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.88	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.24	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.92	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	12.36	(mg/kg)


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Test Report

Sample Number: **VEL/REGL/02** Report No.: **VEL/S0/2107020002**
Format No.: **7.8 F-01**
Name & Address of the Project: **M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade Bade
Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)** Party Reference No.: **NIL**
Reporting Date: **07/07/2021**
Receipt Date: **02/07/2021**
Sampling Date: **25/06/2021**
Type of Sampling: **Composite**
Sampling Quantity: **2.0 Kg**
Depth of Sampling: **30 cm**
Packing Status: **Temp Sealed**
Sample Description: **SOIL**
Sample Collected by: **Vardan EnviroLab Team**
Sampling Protocol: **IS 2720 & USDA**
Location: **Kathli**

Soil Quality Analysis Results

S.No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.36	--
2.	Conductivity	IS:14767:2000,RA:2016	0.352	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	35.62	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.26	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	95.34	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	360.16	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	98.14	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	136.48	(kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.65	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	86.25	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	238.24	(kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	51.32	(kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	14.32	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	132.26	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.36	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	2.31	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.45	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	9.34	(mg/kg)

(Checked By)

(Authorized Signatory)



Test Report

Sample Number: **VEL/REGL/03**

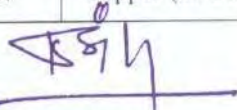
Name & Address of the Project: **M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade Bade
Bhandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)**

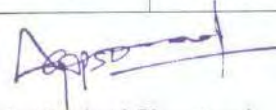
Sample Description: **SOIL**
Sample Collected by: **Vardan EnviroLab Team**
Sampling Protocol: **IS 2720 & USDA**
Location: **Chote Bhandar**

Report No.: **VEL/S0/2107020003**
Format No.: **7.8 F-01**
Party Reference No.: **NIL**
Reporting Date: **07/07/2021**
Receipt Date: **02/07/2021**
Sampling Date: **25/06/2021**
Type of Sampling: **Composite**
Sampling Quantity: **2.0 Kg**
Depth of Sampling: **30 cm**
Packing Status: **Temp Sealed**

Soil Quality Analysis Results

S.No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987.RA:2016	7.42	--
2.	Conductivity	IS:14767:2000,RA:2016	0.356	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	30.27	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.28	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	74.35	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	328.14	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	82.12	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	86.32	(kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972.RA:2015	0.62	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	58.14	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	236.51	(kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	41.58	(kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	18.65	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	118.24	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.68	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.82	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.84	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	16.38	(mg/kg)


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(Authorized Signatory)



Test Report

Sample Number: **VEL/REGL/04**

Name & Address of the Project: **M/s Raigarh Energy Generation Ltd.
Village -Chhote Bhandar,Post Office Bade Bade
Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)**

Sample Description: **SOIL**

Sample Collected by: **Vardan EnviroLab Team**

Sampling Protocol: **IS 2720 & USDA**

Location: **Bade Bhandar**

Report No.: **VEL/S0/2107020004**

Format No.: **7.8 F-01**

Party Reference No.: **NIL**

Reporting Date: **07/07/2021**

Receipt Date: **02/07/2021**

Sampling Date: **25/06/2021**

Type of Sampling: **Composite**

Sampling Quantity: **2.0 Kg**

Depth of Sampling: **30 cm**

Packing Status: **Temp Sealed**

Soil Quality Analysis Results

S.No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.42	--
2.	Conductivity	IS:14767:2000,RA:2016	0.336	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	29.36	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.28	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	94.24	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	332.58	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	89.34	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	91.32	(kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.73	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	42.26	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	248.62	(kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	31.58	(kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	18.48	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	124.22	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	0.48	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.24	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.41	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	9.36	(mg/kg)

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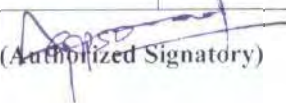
Test Report

Sample Number: **VEL/REGL/05** Report No.: **VEL/S0/2107020005**
Format No.: **7.8 F-01**
Name & Address of the Project: **M/s Raigarh Energy Generation Ltd.** Party Reference No.: **NIL**
Village - Chhote Bhandar, Post Office Bade Bade Reporting Date: **07/07/2021**
Bandar, Tehsil Pussore, Dist- Raigarh Receipt Date: **02/07/2021**
496100 (Chhattisgarh) Sampling Date: **25/06/2021**
Sample Description: **SOIL** Type of Sampling: **Composite**
Sample Collected by: **Vardan EnviroLab Team** Sampling Quantity: **2.0 Kg**
Sampling Protocol: **IS 2720 & USDA** Depth of Sampling: **30 cm**
Location: **Nursery (Near Main Area)** Packing Status: **Temp Sealed**

Soil Quality Analysis Results

S.No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.36	--
2.	Conductivity	IS:14767:2000,RA:2016	0.341	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	28.43	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.23	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	92.57	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	318.14	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	112.28	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	82.34	(kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.53	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	21.47	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	210.26	(kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	36.52	(kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	16.28	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	137.29	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.42	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	4.27	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.86	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	12.48	(mg/kg)

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Project Name: Raigarh Energy Generation Ltd.

Village Chhote Bhandar, Post office Bade Bhandar, Tehsil Pussore, Dist.-Raigarh -496100 (Chhattisgarh)

1st Quarterly Environmental Monitoring Report

4.6 Effluent Sample Analysis Report

Locations

1. STP Outlet
2. ETP Outlet



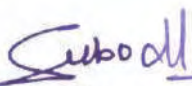
Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/03	Report No.:	VEL/WW/2107020003
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-01
Sample Description:	Waste Water	Party Reference No.:	NIL
Sampling Location :	ETP Outlet	Reporting Date:	07/07/2021
Sample Collected by:	VardanEnviroLab Representative	Receipt Date:	02/07/2021
		Period of Analysis	02-07/07/2021
		Sampling Quantity:	3.0 Ltr
		Sampling Date	25/06/2021
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limit
6.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.65	--	5.5-9.0
7.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	0.68	mg/l	10.0
8.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	20.24	mg/l	100.0
9.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	69.35	mg/l	250.0
10.	Biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	20.0	mg/l	30.0


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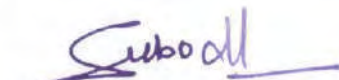
Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/04	Report No.:	VEL/WW/2107020004
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-01
Sample Description:	Waste Water	Party Reference No.:	NIL
Sampling Location :	STP Outlet	Reporting Date:	07/07/2021
Sample Collected by:	VardanEnviroLab Representative	Receipt Date:	02/07/2021
		Period of Analysis	02-07/07/2021
		Sampling Quantity:	3.0 Ltr
		Sampling Date	25/06/2021
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limit
11.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.45	--	5.5-9.0
12.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	1.32	mg/l	10.0
13.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	18.25	mg/l	100.0
14.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	112.0	mg/l	250.0
15.	Biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	22.0	mg/l	30.0


(Checked By)


(Authorized Signatory)

Project Name: Raigarh Energy Generation Ltd.

Village Chhote Bhandar, Post office Bade Bhandar, Tehsil Pussore, Dist.-Raigarh -496100 (Chhattisgarh)

1st Quarterly Environmental Monitoring Report

4.7 Stack Monitoring

Locations

1. TPP



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/ST/01
Name & Address of Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)
Report No.: VEL/S/2107020001
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 07/07/2021
Sample Description: Stack Emission Monitoring
Period of Analysis: 02-07/07/2021
Receipt Date: 02/07/2021

General Information

Sampling Location : TPP
Sample Collected By : VEL Team
Date of Sampling : 25/06/2021
Sampling duration (Minutes) : 35.0 (11:20 to 11:45 Hrs.)
Stack Attached to : TPP
Mack of Stack : Iron
Diameter of Stack (m) : 7.5 mtr.
Height of Stack (m) : 275.0 mtr
Instrument calibration status : Calibrated
Meteorological Condition : Clear Sky
Ambient Temperature - Ta ($^{\circ}$ C) : 33.0
Temperature of Stack Gases - Ts ($^{\circ}$ C) : 124
Velocity of Stack Gases (m/sec.) : 20.3
Flow rate of PM (LPM) : 29.0
Flow rate of Gas (LPM) : 2.0
Sampling condition : Isokinetic
Protocol used : IS :11255 & EPA

RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (PM)	IS 11255 (P-1) 1985 RA:2014	45.36	mg/Nm ³	60
2.	Sulphur Dioxide as (SO ₂)	IS 11255 (P-2) 1985 RA 2017	660.32	mg/Nm ³	600
3.	Oxide of Nitrogen as (NO _x)	IS 11255 (P-7) 2005 RA 2017	276.14	mg/Nm ³	300
4.	Mercury as (Hg)	APHA 3 rd edition 2017, 303A (Page No. 365)	BDL(DL 1.0)	mg/Nm ³	0.03

Note:- *BDL- Below Detection Limit **DL-Detection Limit

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Chapter – 5.0 CONCLUSION

RAIGARH ENERGY GENERATION LTD., authorities have been taken successful steps in controlling environmental pollution in and around the project. This fact is clear from analytical results of different environmental parameters. A brief conclusion is as follows.

Sr. No.	Environmental Parameters	Conclusion
5.1	Air Environment	After analysis of the samples from five different locations it is observed that both the individuals and average concentration of air pollutants in respect of SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} , CO and Mercury are well within the prescribed limits of NAAQM standards. People of township and of surrounding villages do not have any problems regarding the air quality and have no grievances because of Thermal Power Plant activities.
5.2	Water Environment	The analytical result of the samples from the ground water of villages, surface water from river, and domestic & industrial effluent after treatment shows that the concentrations of different water parameters are well within prescribed limits and will not cause any adverse impact on human health and on surrounding area. People of surrounding areas express satisfaction about the water quality of That area.
5.3	Noise Environment	The observations taken at four village location during day and night time shows that the noise level are well within prescribed limits of CPCB. Hence there is no possibility of any adverse effect of noise generated due to Thermal Power Plant activities on peoples of Surrounding areas.

All the above details show that Thermal Power Plant of RAIGARH ENERGY GENERATION LTD. is not causing any adverse impact on the human health and ecological balance.

2nd Quarterly Environmental Monitoring Report



Submitted To:

**M/s Raigarh Energy Generation Ltd.
Village Chhote Bhandar, Post office Bade Bhandar,
Tehsil Pussore, Dist.-Raigarh -496100 (Chhattisgarh)**

Conducted by:

**M/s Vardan EnviroLab
Plot no. 82A, Sector-5, IMT Manesar, Gurugram (Haryana)**

(Recognized by MoEF & CC, NABL Government of India)

PREFACE

The growing concern for environmental protection and the passing of various environmental legislations have increased the responsibilities of Ministry of Environment, Forests & Climate Change, Pollution Control boards in many folds. Besides enforcing the various environmental legislations MoEF&CC, CPCB & SPCB strive to propagate the necessity awareness regarding the various legal provisions and environmental protection measures in the country.

Electric Power scenario has occupied a significant place in the development program of the country. Development and environment can neither be separated nor ignored. In fact, they are complimentary to each other. These issues have become a concern of the community, particularly the environment impact due to industries in the developing countries.

However, the prerequisite for sustainable development is judicious planning of environmental status, likely impacts of the approach adopted on the environment including inhabitants of the locality, availability of the eco-friendly technology, emerging waste disposal and waste utilization processes, techniques of land reclamation for the restoration of aesthetic beauty and soon.

M/s Raigarh Energy Generation Ltd., Village Chhote Bhandar, Post Office Bade Bhandar, Raigarh-496100, India, has engaged M/S Vardan EnviroLab, Gurugram, (HR) to provide Environmental Services in respect of ambient air quality monitoring, stack emission, noise level monitoring & Sampling and Analysis of ground water quality, surface water quality, treated effluent sewage, effluent water from ETP, and soil for Raigarh Energy Generation Ltd., Raigarh district of Chhattisgarh, as per guidelines of MoEF & CC and CPCB Gazette notification.

M/S Vardan EnviroLab, Gurugram, (HR) has deployed entirely its own personnel, facilities and expertise for doing this service. Sampling / Monitoring Stations were identified by the Environmental Officer of Raigarh Energy Generation Ltd., The samples were analyzed partly at site and partly at our MoEF Recognized laboratory situated at Gurugram (HR).

This report presents the data generated for the period from 21st September 2021 to 24th September 2021, i.e. for **Second quarter** which includes sampling locations, Methodology, testing procedure and compilation for the Environmental parameters i.e. Air, Water & Noise with a view to evaluate the impact due to the thermal power plant activities.

During the course of our operations for the above task, the staff and management of Raigarh Energy Generation Ltd., were extremely co-operative. We are grateful to them for their invaluable support and assistance rendered to us during the course of the sampling and monitoring.

Date :

11/10/2021



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Chapter – 1.0

INTRODUCTION

M/s Raigarh Energy Generation Ltd., a subsidiary of Adani Power, is a power generation company based at Raigarh in the State of Chhattisgarh. Raigarh Energy Generation Ltd., has recently commissioned its Thermal Power Plant first 600MW Unit at Village Chhote Bhandar, Post Office Bade Bhandar, Raigarh- 496100, India. The second unit of 600MW is under implementation.

Raigarh Energy Generation Ltd., is also committed towards the environment and the community it operates in. It has successfully implemented several community welfare schemes in the field of livelihood, infrastructure, community health and education which has so far benefited over 60,000 people from close to 75 villages.



Figure No.1. Raigarh Energy Generation Ltd.

Chapter – 2.0

PROJECT PROFILE

2.1 Topography & Drainage

Topography of this area is generally undulating. The area is drained by Mand River approximately 3 km. away from plant in North direction and Mahanadi River approximately 5 km. away from plant in South direction.

2.2 Location

Plant is bounded by Northern Latitudes of 21° 44' 00" to 21° 44' 42" and Eastern Longitude of 83° 16' 30" to 83° 17' 18". This area falls in the survey of India toposheet no. 64 O/1, 64 O/2, 64 O/5 and 64 O/6. The location of the mine area is shown in **Fig. No. 2**

2.3 Climate

The climate of the area is Sub-tropical type. It is in the zone of humid tropic climate where temperature and humidity of air are very high. The temperature varies from the minimum - maximum temperature range between 29.5°C - 49 °C in summer, and 8°C - 25 °C in winter. The humidity varies from 35% to 82%. The annual average rainfall in the area is about 1300 mm.

2.4 Communication

The nearest railway station is Kirodimal, which is at a distance of ~23 Km towards North direction. The area is well connected with N.H. No. 216. Nearest Airport is Raipur ~250 km in SW direction. Nearest village is Bade Bhandar ~ 1 km. in North direction and nearest town is Raigarh ~21 km. in North-East direction.

2.5 Location Map

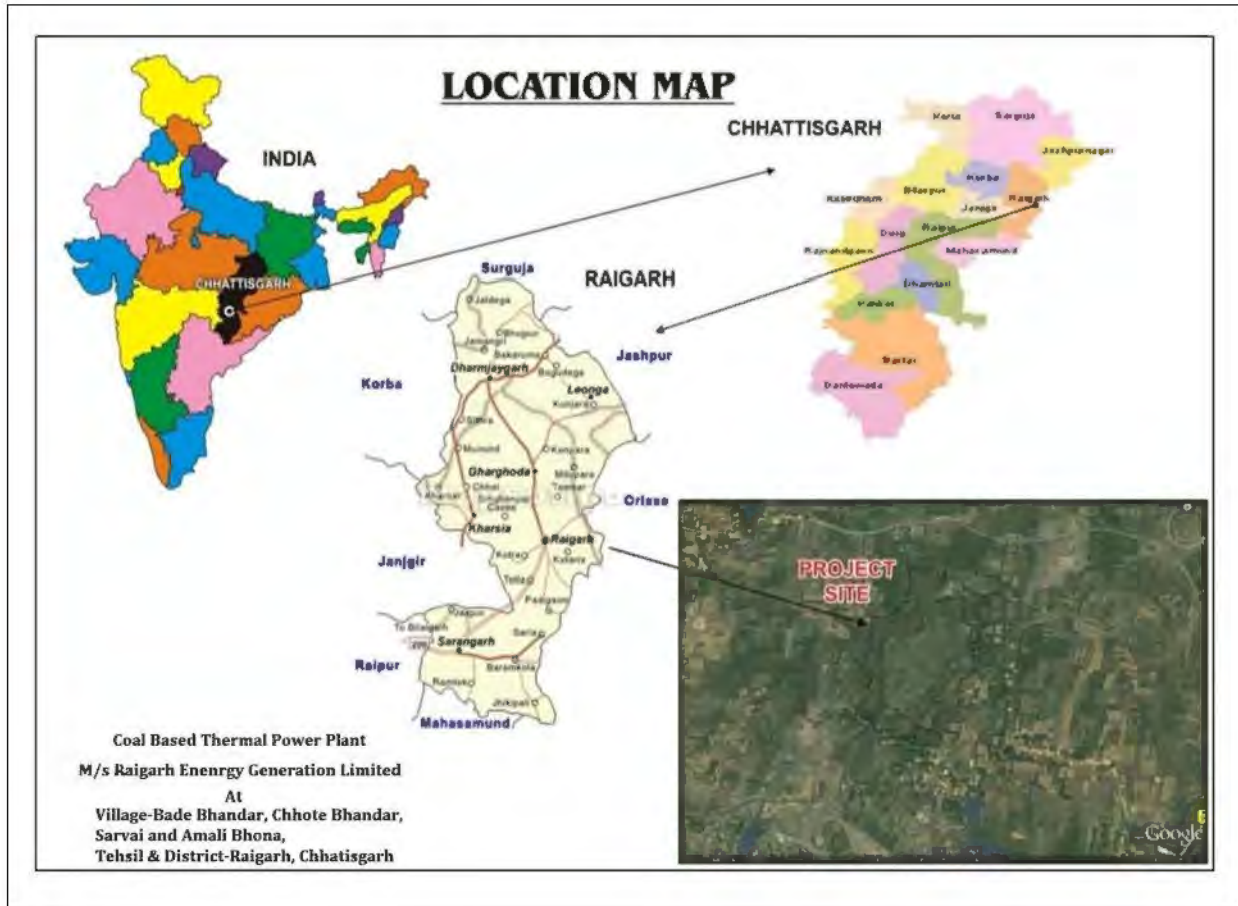


Figure No.2. Location Map

Chapter - 3.0

SCOPE OF STUDY AND METHODOLOGY

3.1 Scope of Study

The scope of study includes Environmental Services in respect of ambient air quality monitoring, noise level monitoring & Sampling and Analysis of ground water quality, surface water quality, treated effluent sewage, effluent water from ETP and soil.

3.2 Methodology

As mentioned in the scope of work covering the various Environmental components monitoring and sampling and its analysis was carried out on the basis of guidelines of Ministry of Environment Forest & Climate Control of Government of India & Chhattisgarh State Pollution Control Board. Sampling procedure method reference and Analysis procedure method reference are mentioned in monitoring reports.

3.2.1 Ambient Air Quality Monitoring

The ambient air quality has been carried out at various sources of air pollution surrounding and in the Plant. The prime objective of the ambient air quality monitoring is to assess the existing air quality of the area.

The ambient air quality monitoring was carried out for 24 hours at each station. At all stations SO₂, NO₂, PM₁₀, PM_{2.5}, CO and Mercury were monitored. All the samples collected were analyzed for quantitative analysis of various pollutants.

The ambient air quality sampling locations were identified by the Environmental Officer of Raigarh Energy Generation Ltd.

3.2.2 Water Environment

The ground water samples, surface water samples were collected from selected locations in two liter sterilized plastic cans. These samples were analyzed as per IS 10500:2012. The domestic effluent and Industrial effluent samples were collected and analyzed for parameters: pH, Total suspended solids, Biochemical Oxygen Demand, Chemical Oxygen Demand and Oil & Grease.

3.2.3 Noise Environment

Sound level meter was used to know the sound levels generated due to plant activities at different locations. The measurements were taken for Equivalent sound level over a time period for day and night which is expressed in dB(A).

3.2.4 Soil

The Soil samples were collected from selected locations. These samples were analyzed for Physico-Chemical parameters including heavy metals.

Chapter – 4.0

SAMPLING LOCATION MAP AND ANALYSIS REPORTS

4.1 Ambient Air Quality Monitoring



Figure No.3. Plan Showing Ambient Air Quality Location Map

- Location Code: -
- A1- Site Office
 - A2- PalsadaVillage
 - A3- Kathali Village
 - A4- Chhote Bhandar Village
 - A5- Bade Bhandar Village
 - A6- Konataral Village
 - A7- Chatamura Chowk
 - A8- Supa, Near REGL Plant
 - A9- Police Station Bhupdeopur



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

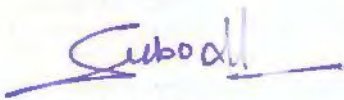
Sample Number: VEL/REGL/AA/01
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)
Report No.: VEL/A/2109280001
Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 01/10/2021
Period of Analysis: 28/09/2021 to 01/10/2021
Receipt Date: 28/09/2021
Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Kondataral
Sample collected by : Vardan EnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/03
Instrument Calibration Status : Calibrated
Latitude : 21°51'52"
Longitude : 83°22'44"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 21/09/2021 to 22/09/2021
Time of Sampling : 10:00 AM to 10:00 AM
Ambient Temperature (°C) : Min. 27°C, Max. 38 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	36.12	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	76.35	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	18.89	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	10.75	µg/m ³	80
5.	Ozone (as O ₃)	IS:51 82 (P- 9)-1974, RA. 2014	8.68	µg/m ³	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m ³	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	182.39	µg/m ³	600

Note :-*BDL-Below Detecation Limit ,**DL-Detecation Limit.



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

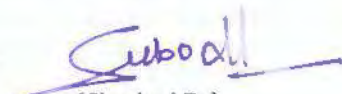
Sample Number: VEL/REGL/AA/02 Report No.: VEL/A/2109280002
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh) Format No.: 7.0 F 01
Party Reference No.: NIL
Report Date: 01/10/2021
Sample Description: Ambient Air Quality Monitoring Period of Analysis: 28/09/2021 to 01/10/2021
Receipt Date: 28/09/2021


General Information:-

Sampling Location : Chatamura Chowk
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude : 21°51'52"
Longitude : 83°22'44"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 21/09/2021 to 22/09/2021
Time of Sampling : 10:40 AM to 10:40 AM
Ambient Temperature (°C) : Min. 27°C, Max. 38 °C
Surrounding Activity : Human, Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	39.45	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	80.61	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	23.12	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	11.02	µg/m ³	80
5.	Ozone (as O ₃)	IS:51 82 (P- 9)-1974, RA. 2014	14.35	µg/m ³	180
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3rd 1988, Method No.317	BDL(*DL-1.0)	ng/m ³	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	276.0	µg/m ³	600

Note :-*BDL-Below Detection Limit, **DL-Detection Limit.


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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
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Test Report

Sample Number: VEL/REGL/AA/03 Report No.: VEL/A/2109280003
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh) Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 01/10/2021
Period of Analysis: 28/09/2021 to 01/10/2021
Sample Description: Ambient Air Quality Monitoring Receipt Date: 28/09/2021

General Information:-

Sampling Location : Supa, Near REGL Plant
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude : 21°45'8"
Longitude : 83°18'4"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 21/09/2021 to 22/09/2021
Time of Sampling : 11.30 AM to 11:30 AM
Ambient Temperature (°C) : Min. 27°C, Max. 38 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	34.47	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5102 (P- 23)-2006,RA. 2017	74.62	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	21.44	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	13.04	µg/m ³	80
5.	Ozone (as O ₃)	IS:51 82 (P- 9)-1974, RA. 2014	9.54	µg/m ³	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(DL-1.0)	ng/m ³	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	192.0	µg/m ³	600

Note :-*BDL-Below Detecation Limit ,**DL-Detecation Limit.

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Test Report

Sample Number: VEL/REGL/AA/04
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)
Sample Description: Ambient Air Quality Monitoring

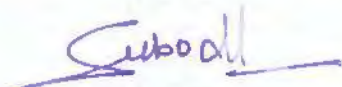
Report No.: VEL/A/2109280004
Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 01/10/2021
Period of Analysis: 28/09/2021 to 01/10/2021
Receipt Date: 28/09/2021

General Information:-

Sampling Location : Site Office
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude : 21°44'27"
Longitude : 83°16'32"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 22/09/2021 to 23/09/2021
Time of Sampling : 11:10 AM to 11:10 AM
Ambient Temperature (°C) : Min. 26°C, Max. 39 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	34.35	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	75.33	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	21.47	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	14.65	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.51	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m ³	--

Note :-*BDL-Below Detecation Limit ,**DL-Detecation Limit.


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Test Report

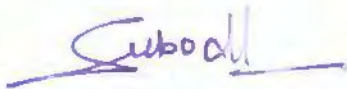
Sample Number: VEL/REGL/AA/05 Report No.: VEL/A/2109280005
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh) Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 01/10/2021
Period of Analysis: 28/09/2021 to 01/10/2021
Sample Description: Ambient Air Quality Monitoring Receipt Date: 28/09/2021

General Information:-

Sampling Location : Village - Palsada
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude : 21°44'13"
Longitude : 83°16'30"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 22/09/2021 to 23/09/2021
Time of Sampling : 11:50 AM to 11:50 AM
Ambient Temperature (°C) : Min. 26°C, Max. 39 °C
Surrounding Activity : Human, Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	36.22	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	73.56	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	20.13	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	13.68	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.71	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3rd 1988, Method No.317	BDL(*DL-1.0)	ng/m ³	--

Note :-*BDL-Below Detection Limit, **DL-Detection Limit.



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VEL/E/1/TR/PN5781

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Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenviromet.com, bd@vardanenviromet.com



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Test Report

Sample Number: VEL/REGL/AA/06
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)
Sample Description: Ambient Air Quality Monitoring

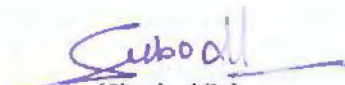
Report No.: VEL/A/2109280006
Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 01/10/2021
Period of Analysis: 28/09/2021 to 01/10/2021
Receipt Date: 28/09/2021

General Information:-

Sampling Location : Village - Kathli
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/03
Instrument Calibration Status : Calibrated
Latitude : 21°44'17"
Longitude : 83°16'19"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 22/09/2021 to 23/09/2021
Time of Sampling : 10:20 AM to 10:20 AM
Ambient Temperature (°C) : Min. 26°C, Max. 39 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	39.27	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	77.42	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	23.54	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	16.35	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.78	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL -1.0)	ng/m ³	--

Note :-*BDL-Below Detecation Limit ,**DL-Detecation Limit.


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ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/07
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade
Bade Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)
Sample Description: Ambient Air Quality Monitoring

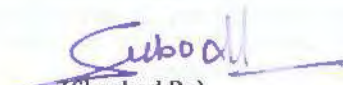
Report No.: VEL/A/2109280007
Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 01/10/2021
Period of Analysis: 28/09/2021 to 01/10/2021
Receipt Date: 28/09/2021

General Information:-

Sampling Location : Village - Chhote Bhandar
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude : 21°44'22"
Longitude : 83°16'43"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 23/09/2021 to 24/09/2021
Time of Sampling : 11:20 AM to 11:20 AM
Ambient Temperature (°C) : Min. 28°C, Max. 36 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	34.36	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	74.98	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	18.87	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	12.02	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.76	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m ³	--

Note :-*BDL-Below Detection Limit ,**DL-Detection Limit.


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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

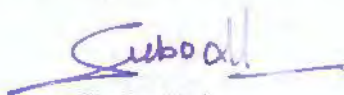
Sample Number: VEL/REGL/AA/08 Report No.: VEL/A/2109280008
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh) Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 01/10/2021
Sample Description: Ambient Air Quality Monitoring Period of Analysis: 28/09/2021 to 01/10/2021
Receipt Date: 28/09/2021


General Information:-

Sampling Location : Bade Bhandar
Sample collected by : VardanEnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude : 21°44'29"
Longitude : 83°17'6"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 23/09/2021 to 24/09/2021
Time of Sampling : 10:45 AM to 10:45 AM
Ambient Temperature (°C) : Min. 28°C, Max. 36 °C
Surrounding Activity : Human, Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	36.18	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	78.33	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	23.61	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	12.86	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.76	mg/m ³	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(DL-1.0)	ng/m ³	--

Note :-*BDL-Below Detecation Limit,**DL-Detecation Limit.


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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
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Test Report

Sample Number: VEL/REGL/AA/09
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)
Sample Description: Ambient Air Quality Monitoring

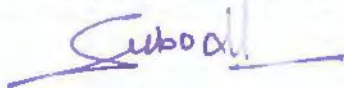
Report No.: VEL/A/2109280009
Format No.: 7.8 F 01
Party Reference No.: NIL
Report Date: 01/10/2021
Period of Analysis: 28/09/2021 to 01/10/2021
Receipt Date: 28/09/2021

General Information:-

Sampling Location : Police Station Bhupdeopur
Sample collected by : Vardan EnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/03
Instrument Calibration Status : Calibrated
Latitude : 21°51'52"
Longitude : 83°22'44"
Meteorological condition during monitoring : Clear sky
Date of Sampling : 23/09/2021 to 24/09/2021
Time of Sampling : 10:50 AM to 10:50 AM
Ambient Temperature (°C) : Min. 28°C, Max. 36 °C
Surrounding Activity : Human , Vehicular & Plant Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	37.23	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS:5182 (P- 23)-2006,RA. 2017	74.36	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS:5182 (P- 6)-2006 RA.2017	20.15	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS:51 82 (P- 2)-2001, RA. 2017	12.06	µg/m ³	80
5.	Ozone (as O ₃)	IS:51 82 (P- 9)-1974, RA. 2014	14.41	µg/m ³	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m ³	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	232.0	µg/m ³	600

Note :-*BDL-Below Detecation Limit,**DL-Detecation Limit.



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4.2 Noise Level Monitoring



Figure No.4. Plan Showing Noise Level Monitoring Location Map

Ambient Noise Level Monitoring Locations

- Location Code: -
- N1- Palsada Village
 - N2- Kathali Village
 - N3- Chote Bhandar Village
 - N4- Bade Bhandar Village



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/AN/01	Report No.:	VEL/N/2109280001
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
Sample Description:	Ambient Noise Level Monitoring	Reporting Date:	02/10/2021
Scope of Monitoring	Regulatory Requirement	Receipt Date:	28/09/2021
Protocol Used:	IS 9989; IS 9876	Sampling Duration	24 Hrs.
Instrument Used	SLM	Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

Ambient Noise Level Monitoring Results

General Information:-

Sampling Location	: Village- Bade Bhandar
Instrument Code	: VEL/SLM/06
Meteorological condition during monitoring	: Clear sky
Date of Monitoring	: 21/09/2021 to 22/09/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 28°C, Max. 33 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	64.5	53.2
2.	M min	IS:9989,IS9876:1981	42.8	39.7
3.	Leq	IS:9989,IS9876:1981	54.36	42.52

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/AN/02	Report No.:	VEL/N/2109280002
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	02/10/2021
Protocol Used:	IS 9989: IS 9876	Receipt Date:	28/09/2021
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

Ambient Noise Level Monitoring Results

General Information:-

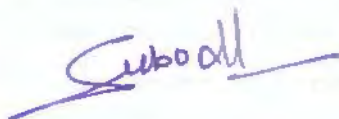
Sampling Location	: Village- Palsada
Instrument Code	: VEL/SLM/06
Meteorological condition during monitoring	: Clear sky
Date of Monitoring	: 22/09/2021 to 23/09/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 26°C, Max. 36 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	63.8	55.2
2.	M min	IS:9989,IS9876:1981	41.1	38.5
3.	Leq	IS:9989,IS9876:1981	52.56	43.89

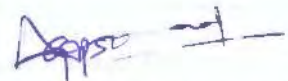
Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/AN/03	Report No.:	VEL/N/2109280003
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - ChhoteBhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
Sample Description:	Ambient Noise Level Monitoring	Reporting Date:	02/10/2021
Scope of Monitoring	Regulatory Requirement	Receipt Date:	28/09/2021
Protocol Used:	IS 9989: IS 9876	Sampling Duration	24 Hrs.
Instrument Used	SLM	Sample Collected by	VEL Team
		Instrument Calibration Status	Calibrated

Ambient Noise Level Monitoring Results

General Information:-

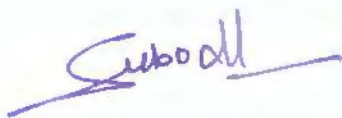
Sampling Location	: Kathli
Instrument Code	: VEL/SLM/06
Meteorological condition during monitoring	: Clear sky
Date of Monitoring	: 23/09/2021 to 24/09/2021
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 26°C, Max. 34 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	69.3	54.2
2.	M min	IS:9989,IS9876:1981	43.6	39.4
3.	Leq	IS:9989,IS9876:1981	53.38	42.87

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	78
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/AN/04	Report No.:	VEL/N/2109280004
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
Sample Description:	Ambient Noise Level Monitoring	Reporting Date:	02/10/2021
Scope of Monitoring	Regulatory Requirement	Receipt Date:	28/09/2021
Protocol Used:	IS 9989: IS 9876	Sampling Duration	24 Hrs.
Instrument Used	SLM	Sample Collected by	VEL Team
		Instrument Calibration Status	Calibrated

Ambient Noise Level Monitoring Results

General Information:-

Sampling Location	: Chhote Bhandar
Instrument Code	: VEL/SLM/06
Meteorological condition during monitoring	: Clear sky
Date of Monitoring	: 24/09/2021 to 25/09/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 26°C, Max. 35 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	67.5	46.8
2.	M min	IS:9989,IS9876:1981	42.2	38.2
3.	Leq	IS:9989,IS9876:1981	53.87	42.65

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply

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4.3 Ground water Quality Analysis



Figure No.5. Plan Showing Ground Water Quality Monitoring Location Map

Location Code: -

- GW1- Site Office
- GW2- PalsadaVillage
- GW3- Kathali Village
- GW4- Chote Bhandar Village
- GW5- Bade Bhandar Village



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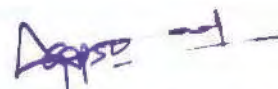
Test Report

Sample Number:	VEL/REGL/W/02	Report No.:	VEL/W/2109280002
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village -ChhoteBhandar,Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
		Reporting Date:	04/10/2021
Sample Description:	Ground Water	Period of Analysis:	28-09-2021 to 04-10-2021
Sampling Location:	Village- Palsada	Receipt Date:	28/09/2021
Sample Collected by	Vardan EnviroLab Representative	Sampling Date:	24/09/2021
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 23 rd Edition, 4500-H+ B	7.44	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 rd Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 rd Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 rd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 rd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 23 rd Edition, 2340 C	192.0	mg/l	200	600
7.	Calcium as Ca	APHA 23 rd Edition, 3500 Ca B	46.17	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 23 rd Edition, 2320 B	181.5	mg/l	200	600
9.	Chloride as Cl	APHA 23 rd Edition, 4500-Cl- B	52.81	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 rd Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH ₃)	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 rd Edition, 2340 B	18.61	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 rd Edition, 2540 C	314.0	mg/l	500	2000
14.	Sulphate as SO ₄	APHA 23 rd Edition, 4500 E	25.66	mg/l	200	400


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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/02				Report No.: VEL/W/2109280002		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F D	0.38	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	3.09	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 rd Ed.,2017, 3500 Fe-B	0.13	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 rd Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 rd Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxatinn
27.	Sulphide	APHA 23 rd Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E.Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

Note: *BDL-Below Detection Limit, *DL- Detection Limit.

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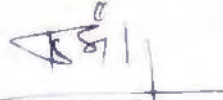
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

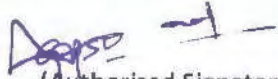
Test Report

Sample Number:	VEL/REGL/W/03	Report No.:	VEL/W/2109280003
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
		Reporting Date:	04/10/2021
Sample Description:	Ground Water	Period of Analysis:	28-09-2021 to 04-10-2021
Sampling Location:	Village- Kathli	Receipt Date:	28/09/2021
Sample Collected by	Vardan EnviroLab Representative	Sampling Date:	24/09/2021
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 23 rd Edition, 4500-H+ B	7.37	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 rd Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 rd Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 rd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 rd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 23 rd Edition, 2340 C	238.88	mg/l	200	600
7.	Calcium as Ca	APHA 23 rd Edition, 3500 Ca B	66.18	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 23 rd Edition, 2320 B	232.1	mg/l	200	600
9.	Chloride as Cl	APHA 23 rd Edition, 4500-Cl- B	58.46	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 rd Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l	8.2	1
11.	Ammonia (as NH ₃)	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 rd Edition, 2340 B	17.65	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 rd Edition, 2540 C	369.0	mg/l	500	2000
14.	Sulphate as SO ₄	APHA 23 rd Edition, 4500 E	27.07	mg/l	200	400


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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/03			Report No.: VEL/W/2109280003			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F-D	0.43	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	4.68	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 rd Ed.,2017, 3500 Fe-B	0.13	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 rd Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 rd Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 rd Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E.Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

Note:- *BDL-Below Detection Limit, *DL- Detection Limit.

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001


Test Report

Sample Number:	VEL/REGL/W/04	Report No.:	VEL/W/2109200004
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
		Reporting Date:	04/10/2021
Sample Description:	Ground Water	Period of Analysis:	28-09-2021 to 04-10-2021
Sampling Location:	Village - Chhote Bhandar	Receipt Date:	28/09/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	24/09/2021
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 23 rd Edition, 4500-H+ B	7.41	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 rd Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 rd Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 rd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 rd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 23 rd Edition, 2340 C	253.44	mg/l	200	600
7.	Calcium as Ca	APHA 23 rd Edition, 3500 Ca B	72.34	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 23 rd Edition, 2320 B	223.7	mg/l	200	600
9.	Chloride as Cl	APHA 23 rd Edition, 4500-Cl- B	67.89	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 rd Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH ₃)	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 rd Edition, 2340 B	17.64	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 rd Edition, 2540 C	396.0	mg/l	500	2000
14.	Sulphate as SO ₄	APHA 23 rd Edition, 4500 E	30.39	mg/l	200	400


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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/04			Report No.: VEL/W/2109280004			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F-D	0.39	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	3.17	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 rd Ed.,2017, 3500 Fe-B	0.12	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 rd Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 rd Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 rd Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E.Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

Note: *BDL-Below Detection Limit, *DL- Detection Limit.

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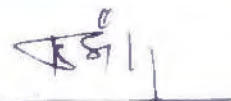
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/05	Report No.:	VEL/W/2109200005
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
		Reporting Date:	04/10/2021
Sample Description:	Ground Water	Period of Analysis:	28-09-2021 to 04-10-2021
Sampling Location:	Village- Bade Bhandar	Receipt Date:	28/09/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	24/09/2021
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 23 rd Edition, 4500-H+ B	7.55	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 rd Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 rd Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 rd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 rd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 23 rd Edition, 2340 C	422.4	mg/l	200	600
7.	Calcium as Ca	APHA 23 rd Edition, 3500 Ca B	69.26	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 23 rd Edition, 2320 B	185.7	mg/l	200	600
9.	Chloride as Cl	APHA 23 rd Edition, 4500-Cl- B	67.89	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 rd Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH ₃)	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 rd Edition, 2340 B	60.57	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 rd Edition, 2540 C	425.0	mg/l	500	2000
14.	Sulphate as SO ₄	APHA 23 rd Edition, 4500 E	27.37	mg/l	200	400


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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/05			Report No.: VEL/W/2109280005			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F D	0.34	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	3.02	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 rd Ed.,2017, 3500 Fe-B	0.19	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 rd Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 rd Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 rd Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E.Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

Note:- *BDL-Below Detection Limit, *DL- Detection Limit.

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/06	Report No.:	VEL/W/2109288006
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village -ChhoteBhandar,Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
		Reporting Date:	04/10/2021
Sample Description:	Ground Water	Period of Analysis:	28-09-2021 to 04-10-2021
Sampling Location:	Site Office	Receipt Date:	28/09/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	24/09/2021
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 23 rd Edition, 4500-H+ B	7.65	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 rd Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 rd Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 rd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 rd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 23 rd Edition, 2340 C	142.08	mg/l	200	600
7.	Calcium as Ca	APHA 23 rd Edition, 3500 Ca B	49.25	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 23 rd Edition, 2320 B	118.2	mg/l	200	600
9.	Chloride as Cl	APHA 23 rd Edition, 4500-Cl- B	43.38	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 rd Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH ₃)	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 rd Edition, 2340 B	4.61	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 rd Edition, 2540 C	288.0	mg/l	500	2000
14.	Sulphate as SO ₄	APHA 23 rd Edition, 4500 E	15.9	mg/l	200	400


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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/06				Report No.: VEL/W/2109280006		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 rd Edition,2017, 4500-F D	0.34	mg/l	1.0	1.5
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	2.04	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 rd Ed.,2017, 3500 Fe-B	0.15	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 rd Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 rd Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 rd Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 rd Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 rd Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 rd Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 rd Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 rd Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E.Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal.Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 rd Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 rd Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

Note:- *BDL-Below Detection Limit, *DL- Detectinn Limit.

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4.4 Surface water Quality Analysis



Figure. No. 6. Plan Showing Surface Water Quality Monitoring Location Map

Location Code: - 1. Mand River (Up Stream)

2. Mand River (Down Stream)



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/08	Report No.:	VEL/W/2109280008
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - ChhoteBhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
		Reporting Date:	04/10/2021
Sample Description:	Surface Water	Period of Analysis:	28-09-2021 to 04-10-2021
Sampling Location:	Mand River (Down Stream)	Receipt Date:	28/09/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	24/09/2021
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 rd Edition, 4500-H ⁺ B	7.42	--
2.	Colour	APHA 23 rd Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 rd Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 rd Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 rd Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO ₃	APHA 23 rd Edition, 2340 C	138.24	mg/l
7.	Calcium as Ca	APHA 23 rd Edition, 3500 Ca B	38.48	mg/l
8.	Alkalinity as CaCO ₃	APHA 23 rd Edition, 2320 B	88.6	mg/l
9.	Chloride as Cl	APHA 23 rd Edition, 4500-Cl ⁻ B	64.12	mg/l
10.	Residual Free Chlorine	APHA [23 rd Edition 2017] 3500 Cl ⁻ B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH ₃)	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 rd Edition, 2340 B	10.22	mg/l
13.	Total Dissolved Solids	APHA 23 rd Edition, 2540 C	258.0	mg/l
14.	Sulphate as SO ₄	APHA 23 rd Edition, 4500 E	34.71	mg/l

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGI/W/08			Report No.: VEL/W/2109280008	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 rd Edition, 2017, 4500-F-D	0.29	mg/l
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	5.43	mg/l
17.	Iron as Fe	APHA 23 rd Ed., 2017, 3500 Fe-B	0.20	mg/l
18.	Aluminium as Al	APHA 23 rd Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 rd Edition, 4500 C	0.29	mg/l
20.	Phenolic Compounds	APHA 23 rd Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 rd Edition, 2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 rd Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 rd Edition 2017, 3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 rd Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 rd Edition, 4500 S2 F, 2017	BDL(DL 0.02)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l
29.	Total Coliform	IS:1622:2009	63	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal Coliform	IS:1622:2009	43	MPN/ 100ml
32.	Arsenic as As	APHA (23 rd Edition) 3030D, 3114C, 2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APIA (23 rd Edition) 3114C, 2017	BDL(DL 0.001)	mg/l

Note:- *BDL-Below Detection Limit, *DL- Detection Limit.

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/09	Report No.:	VEL/W/2109280009
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
		Reporting Date:	04/10/2021
Sample Description:	Surface Water	Period of Analysis:	28-09-2021 to 04-10-2021
Sampling Location:	Mand River (Up Stream)	Receipt Date:	28/09/2021
Sample Collected by	Vardan EnviroLab Representative	Sampling Date:	24/09/2021
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 rd Edition, 4500-H ⁺ B	7.63	--
2.	Colour	APHA 23 rd Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 rd Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 rd Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 rd Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO ₃	APHA 23 rd Edition, 2340 C	103.68	mg/l
7.	Calcium as Ca	APHA 23 rd Edition, 3500 Ca B	35.4	mg/l
8.	Alkalinity as CaCO ₃	APHA 23 rd Edition, 2320 B	76.0	mg/l
9.	Chloride as Cl	APHA 23 rd Edition, 4500-Cl B	39.6	mg/l
10.	Residual Free Chlorine	APHA (23 rd Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH ₃)	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 rd Edition, 2340 B	3.7	mg/l
13.	Total Dissolved Solids	APHA 23 rd Edition, 2540 C	204.0	mg/l
14.	Sulphate as SO ₄	APHA 23 rd Edition, 4500 E	17.91	mg/l

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/09			Report No.: VEL/W/2109280009	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 rd Edition, 2017, 4500-F-D	0.34	mg/l
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	5.21	mg/l
17.	Iron as Fe	APHA 23 rd Ed., 2017, 3500 Fe-B	0.20	mg/l
18.	Aluminium as Al	APHA 23 rd Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 rd Edition, 4500 C	BDL(DL 0.001)	mg/l
20.	Phenolic Compounds	APHA 23 rd Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 rd Edition, 2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 rd Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 rd Edition 2017, 3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 rd Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 rd Edition, 4500 S2 F, 2017	2.04	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l
29.	Total Coliform	IS:1622:2009	43	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal Coliform	IS:1622:2009	31	MPN/ 100ml
32.	Arsenic as As	APHA (23 rd Edition) 3030D, 3114C, 2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 rd Edition) 3114C, 2017	BDL(DL 0.001)	mg/l

Note:- *BDL-Below Detection Limit, *DL- Detection Limit.

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Figure. No. 7. Plan Showing Surface Water Quality Monitoring Location Map



Location Code: - 1 Mahanadi River Up Stream
2 Mahanadi River down Stream



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/10	Report No.:	VEL/W/2109280010
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village -ChhoteBhandar,Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.B F 01
		Party Reference No.:	NIL
		Reporting Date:	04/10/2021
Sample Description:	Surface Water	Period of Analysis:	28-09-2021 to 04-10-2021
Sampling Location:	Mahanadi (Down Stream)	Receipt Date:	28/09/2021
Sample Collected by	Vardan EnviroLab Representative	Sampling Date:	24/09/2021
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 rd Edition, 4500-H ⁺ B	7.34	--
2.	Colour	APHA 23 rd Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 rd Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 rd Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 rd Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO ₃	APHA 23 rd Edition, 2340 C	153.6	mg/l
7.	Calcium as Ca	APHA 23 rd Edition, 3500 Ca B	50.79	mg/l
8.	Alkalinity as CaCO ₃	APHA 23 rd Edition, 2320 B	126.6	mg/l
9.	Chloride as Cl	APHA 23 rd Edition, 4500-Cl ⁻ B	62.24	mg/l
10.	Residual Free Chlorine	APHA (23 rd Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH ₃)	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 rd Edition, 2340 B	6.47	mg/l
13.	Total Dissolved Solids	APHA 23 rd Edition, 2540 C	311.0	mg/l
14.	Sulphate as SO ₄	APHA 23 rd Edition, 4500 E	48.75	mg/l

(Checked By)

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/10			Report No.: VEL/W/2109280010	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 rd Edition, 2017, 4500-F D	0.35	mg/l
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	6.79	mg/l
17.	Iron as Fe	APHA 23 rd Ed., 2017, 3500 Fe-B	0.22	mg/l
18.	Aluminium as Al	APHA 23 rd Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 rd Edition, 4500 C	BDL(DL 0.001)	mg/l
20.	Phenolic Compounds	APHA 23 rd Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 rd Edition, 2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 rd Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 rd Edition 2017, 3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 rd Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 rd Edition, 4500 S2 F, 2017	BDL(DL 0.02)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l
29.	Total Coliform	IS:1622:2009	70	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal Coliform	IS:1622:2009	63	MPN/ 100ml
32.	Arsenic as As	APHA (23 rd Edition) 3030D, 3114C, 2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 rd Edition) 3114C, 2017	BDL(DL 0.001)	mg/l

Note:- *BDL-Below Detection Limit, *DL- Detection Limit.

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/11	Report No.:	VEL/W/2109280011
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - ChhnteBhandar, Pnst Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
		Party Reference No.:	NIL
		Reporting Date:	04/10/2021
Sample Description:	Surface Water	Period of Analysis:	28-09-2021 to 04-10-2021
Sampling Location:	Mahanadi (Up Stream)	Receipt Date:	28/09/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	24/09/2021
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 rd Edition, 4500-H ⁺ B	7.5	--
2.	Colour	APHA 23 rd Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 rd Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 rd Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 rd Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO ₃	APHA 23 rd Edition, 2340 C	107.52	mg/l
7.	Calcium as Ca	APHA 23 rd Edition, 3500 Ca B	29.24	mg/l
8.	Alkalinity as CaCO ₃	APHA 23 rd Edition, 2320 B	113.9	mg/l
9.	Chloride as Cl	APHA 23 rd Edition, 4500-Cl B	62.24	mg/l
10.	Residual Free Chlorine	APHA (23 rd Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH ₃)	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 rd Edition, 2340 B	8.36	mg/l
13.	Total Dissolved Solids	APHA 23 rd Edition, 2540 C	237.0	mg/l
14.	Sulphate as SO ₄	APHA 23 rd Edition, 4500 E	12.48	mg/l

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/11			Report No.: VEL/W/2109280011	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 rd Edition, 2017, 4500-F D	0.26	mg/l
16.	Nitrate as NO ₃	IS 3025 (P-34) 1988:RA.2019	6.04	mg/l
17.	Iron as Fe	APHA 23 rd Ed., 2017, 3500 Fe-B	0.21	mg/l
18.	Aluminium as Al	APHA 23 rd Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 rd Edition, 4500 C	BDL(DL 0.001)	mg/l
20.	Phenolic Compounds	APHA 23 rd Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 rd Edition, 2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 rd Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 rd Edition 2017, 3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 rd Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 rd Edition, 4500 S2 F, 2017	BDL(DL 0.02)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l
29.	Total Coliform	IS:1622:2009	33	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal Coliform	IS:1622:2009	21	MPN/ 100ml
32.	Arsenic as As	APHA (23 rd Edition) 3030D, 3114C, 2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 rd Edition) 3114C, 2017	BDL(DL 0.001)	mg/l

Note:- *BDL-Below Detection Limit, *DL- Detection Limit.

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4.5 Soil Quality Analysis



Figure No. 8. Plan Showing Soil Sample Monitoring Location Map

Location Code: -

- S1- PalsadaVillage
- S2- Kathli Village
- S3- Chote Bhandar Village
- S4- Bade Bhandar Village
- S5- Nursery



Vardan EnviroLab

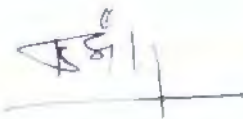
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001


Test Report

Sample Number: : VEL/REGL/01 Report No.: : VEL/S0/2109280001
Name & Address of the Party: : M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office
Bade Bandar, Tehsil Pussore, Dist-
Raigarh 496100 (Chhattisgarh) Format No.: : 7.8 F 01
Party Reference No. : NIL
Reporting Date: : 04/10/2021
Period of Analysis : : 28-04/10/2021
Receipt Date: : 28/09/2021
Sample Description: : SOIL Sampling Date: : 24/09/2021
Location : Village Palsada Sampling Quantity: : 2 kg.
Sample Collected By : Vardan EnviroLab Team Sampling Type: : Composite
Parameter Required : As per work order Packing Status: : Temp. Sealed
Sampling and Analysis Protocol : IS 2720 & USDA

Soil Quality Analysis Results

S. No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.76	--
2.	Conductivity	IS:14767:2000,RA:2016	0.382	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	40.00	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.38	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	100.77	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	343.01	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	92.00	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	125.22	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.72	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	90.92	(mg/kg)
13.	Available Nitrogen (as N)	IS:14684:1999,RA:2015	211.22	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	37.24	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	19.02	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	130.21	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.96	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	4.82	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.82	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	21.00	(mg/kg)


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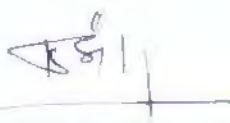
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001


Test Report

Sample Number: : VEL/REGL/02
Name & Address of the Party: : M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office
Bade Bandar, Tehsil Pussore, Dist-
Raigarh 496100 (Chhattisgarh)
Report No.: : VEL/S0/2109280002
Format No.: : 7.8 F 01
Party Reference No. : NIL
Reporting Date: : 04/10/2021
Period of Analysis : : 28-04/10/2021
Receipt Date: : 28/09/2021
Sampling Date: : 24/09/2021
Sample Quantity: : 2 kg.
Sample Description: : SOIL
Location : Village Kathli
Sample Collected By : Vardan EnviroLab Team
Parameter Required : As per work order
Sampling and Analysis Protocol : IS 2720 & USDA
Sampling Type: : Composite
Packing Status: : Temp. Sealed

Soil Quality Analysis Results

S. No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.44	--
2.	Conductivity	IS:14767:2000,RA:2016	0.412	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	38.00	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.32	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	98.14	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	377.08	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	101.20	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	141.13	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.69	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	96.30	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	242.60	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	56.41	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	18.22	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	134.12	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.44	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.13	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.54	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	12.31	(mg/kg)


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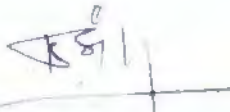
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

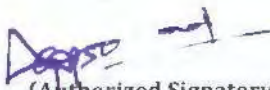
Test Report

Sample Number: : VEL/REGL/03 Report No.: : VEL/S0/2109280003
Name & Address of the Party: : M/s Raigarh Energy Generation Ltd. Format No.: : 7.8 F 01
Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh) Party Reference No. : NIL
Reporting Date: : 04/10/2021
Sample Description: : SOIL Period of Analysis : : 20-04/10/2021
Location : Village Chote Bhandar Receipt Date: : 28/09/2021
Sampling Date: : 24/09/2021
Sample Collected By : Vardan EnviroLab Team Sample Quantity: : 2 kg.
Parameter Required : As per work order Sampling Type: : Composite
Sampling and Analysis Protocol : IS 2720 & USDA Packing Status: : Temp. Sealed

Soil Quality Analysis Results

S. No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.51	--
2.	Conductivity	IS:14767:2000,RA:2016	0.302	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	33.23	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.42	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	82.29	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	231.36	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	88.20	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	90.86	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.89	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	65.03	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	249.62	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	46.12	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	21.49	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	128.22	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.72	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	9.15	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.91	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	18.05	(mg/kg)


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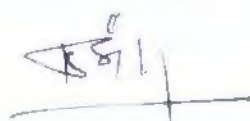
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ISO 9001 | ISO 14001 | ISO 45001

Test Report

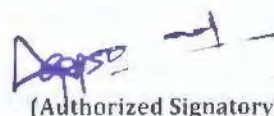
Sample Number: : VEL/REGL/04
Name & Address of the Party: : M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office
Bade Bandar, Tehsil Pussore, Dist-
Raigarh 496100 (Chhattisgarh)
Report No.: : VEL/S0/2109280004
Format No.: : 7.8 F 01
Party Reference No. : NIL
Reporting Date: : 04/10/2021
Period of Analysis : : 28-04/10/2021
Receipt Date: : 28/09/2021
Sampling Date: : 24/09/2021
Sample Description: : SOIL
Location : Village Bade Bhandar
Sample Collected By : Vardan EnviroLab Team
Sample Quantity: : 2 kg.
Parameter Required : As per work order
Sampling Type: : Composite
Sampling and Analysis Protocol : IS 2720 & USDA
Packing Status: : Temp. Sealed

Soil Quality Analysis Results

S. No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.62	--
2.	Conductivity	IS:14767:2000,RA:2016	0.401	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	36.62	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.35	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	99.17	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	311.32	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	94.00	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	97.28	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.81	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	51.44	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	267.23	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	42.39	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	28.01	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	139.08	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	0.67	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.61	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.63	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	15.46	(mg/kg)



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)

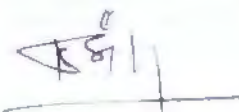
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: : VEL/REGL/05
Name & Address of the Party: : M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office
Bade Bandar, Tehsil Pussore, Dist-
Raigarh 496100 (Chhattisgarh)
Report No.: : VEL/S0/2109280005
Format No.: : 7.8 F 01
Party Reference No. : NIL
Reporting Date: : 04/10/2021
Period of Analysis : : 28-04/10/2021
Receipt Date: : 28/09/2021
Sampling Date: : 24/09/2021
Sample Description: : SOIL
Location : : Nursery (Near Main Area)
Sample Collected By : : Vardan EnviroLab Team
Sample Quantity: : : 2 kg.
Parameter Required : : As per work order
Sampling Type: : : Composite
Sampling and Analysis Protocol : : IS 2720 & USDA
Packing Status: : : Temp. Sealed

Soil Quality Analysis Results

S. No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.91	--
2.	Conductivity	IS:14767:2000,RA:2016	0.367	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	32.54	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.27	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	115.80	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	322.19	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	126.70	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	99.25	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.59	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	33.17	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	224.97	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	52.21	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	24.12	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	1.44	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.57	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	4.44	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.94	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	14.20	(mg/kg)



(Checked By)



(Authorized Signatory)



www.vardan.co.in

Project Name: Raigarh Energy Generation Ltd.

Village Chhote Bhandar, Post office Bade Bhandar, Tehsil Pussore, Dist.-Raigarh -496100 (Chhattisgarh)

2nd Quarterly Environmental Monitoring Report

4.6 Effluent Sample Analysis Report

Locations

1. STP Outlet
2. ETP Outlet




Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/03	Report No.:	VEL/WW/2109280003
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-01
Sample Description:	Waste Water	Party Reference No.:	NIL
Sampling Location :	ETP Outlet	Reporting Date:	02/10/2021
Sample Collected by:	VardanEnviroLab Representative	Receipt Date:	28/09/2021
		Period of Analysis	28/09/2021-02/10/2021
		Sampling Quantity:	3.0 Ltr
		Sampling Date	25/09/2021
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limit
1.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.52	--	5.5-9.0
2.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	0.6	mg/l	10.0
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	23.9	mg/l	100.0
4.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	71.3	mg/l	250.0
5.	Biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	21.6	mg/l	30.0


(Checked By)


(Authorized Signatory)






Vardan EnviroLab

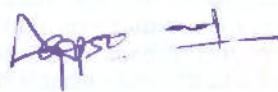
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/04	Report No.:	VEL/WW/2109280004
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-01
Sample Description:	Waste Water	Party Reference No.:	NIL
Sampling Location :	STP Outlet	Reporting Date:	02/10/2021
Sample Collected by:	VardanEnviroLab Representative	Receipt Date:	28/09/2021
		Period of Analysis	28/09/2021-02/10/2021
		Sampling Quantity:	3.0 Ltr
		Sampling Date	25/09/2021
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limit
1.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.35	--	5.5-9.0
2.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	1.6	mg/l	10.0
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	17.6	mg/l	100.0
4.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	121.5	mg/l	250.0
5.	Bi biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	19.9	mg/l	30.0


(Checked By)


(Authorized Signatory)



www.vardan.co.in

Project Name: Raigarh Energy Generation Ltd.

Village Chhote Bhandar, Post office Bade Bhandar, Tehsil Pussore, Dist.-Raigarh -496100 (Chhattisgarh)

2nd Quarterly Environmental Monitoring Report

4.7 Stack Emission Analysis Report

Locations

1. TPP



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/ REGL/S/01 Report No.: VEL /S/2109280001
Name & Address of Party: M/s Raigarh Energy Generation Ltd.
Village- Chhote Bhandar, Post Office
Bade Bandar, Tehsil Pussore, Dist-
Raigarh 496100 (Chhattisgarh) Format No.: 5.10 F-01
Party Reference No.: NIL
Reporting Date: 01/10/2021
Period of Analysis: 28/09/2021 to
01/10/2021
Sample Description : STACK EMISSION MONITORING Receipt Date: 28/09/2021

Sample Collected : VEL Team
Date & Time of Sampling : 23/09/2021
Location : TPP
Sampling duration (Minutes) : 38.0 & 11:00 to 11:38 Hrs.
Meteorological Condition : Clear Sky
Stack Attached : TPP
Stack Diameter : 7.5 m
Stack Height : 275 m
Instrument calibration status : Calibrated
Ambient Temperature - Ta (°C) : 31.0
Temperature of Stack Gases - Ts (°C) : 128
Velocity of Stack Gases (m/sec.) : 21.14
Flow rate of PM (LPM) : 26.0
Flow rate of Gas (LPM) : 2.0 (933.46 m3/sec)
Sampling condition : Isokinetic
Protocol used : IS-11255 &EPA

RESULTS

S. No.	Parameter	Protocol	Results	Units	Limits
1.	Particulate Matter (as PM)	IS 11255 (P-1) :1985,RA,2014	43.57	mg/Nm3	50.0
2.	Sulphur Dioxide (as SO2)	IS: 11255 (p-2)1985, RA. 2014	665.74	mg/Nm3	200.0
3.	Oxide of Nitrogen (as NO2)	IS 11255 (P-7)RA,2017	286.12	mg/Nm3	450.0
4.	Mercury (as Hg)	APHA 3rd ed,2017, 303A (Page No. 365)	BDL(DL0.001)	mg/Nm3	0.03

BDL*(Below Detection Limit) ** (DL Detection Limit)

(Checked By)

(Authorized Signatory)



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Chapter – 5.0 CONCLUSION

RAIGARH ENERGY GENERATION LTD., authorities have been taken successful steps in controlling environmental pollution in and around the project. This fact is clear from analytical results of different environmental parameters. A brief conclusion is as follows.

Sr. No.	Environmental Parameters	Conclusion
5.1	Air Environment	After analysis of the samples from five different locations it is observed that both the individuals and average concentration of air pollutants in respect of SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} , CO and Mercury are well within the prescribed limits of NAAQM standards. People of township and of surrounding villages do not have any problems regarding the air quality and have no grievances because of Thermal Power Plant activities.
5.2	Water Environment	The analytical result of the samples from the ground water of villages, surface water from river, and domestic & industrial effluent after treatment shows that the concentrations of different water parameters are well within prescribed limits and will not cause any adverse impact on human health and on surrounding area. People of surrounding areas express satisfaction about the water quality of That area.
5.3	Noise Environment	The observations taken at four village location during day and night time shows that the noise level are well within prescribed limits of CPCB. Hence there is no possibility of any adverse effect of noise generated due to Thermal Power Plant activities on peoples of Surrounding areas.

All the above details show that Thermal Power Plant of RAIGARH ENERGY GENERATION LTD. is not causing any adverse impact on the human health and ecological balance.

Annexure - II

Ash Generation and Utilization Report (April' 2021 - September'2021)

Sl. No.	ASH GENERATION AND UTILIZATION (in LMT)						MODES OF ASH UTILIZATION AND UTILIZATION IN EACH MODE (in LMT)							
	Month	Coal consumed	Ash content of coal(%)	Ash Generation	Ash Utilization	% age Utilization	In the making of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part replacement of cement in concrete	In Hydro Power Sector in RCC Dam Construction	In Ash dyke raising	In the reclamation of low lying Areas	Others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1	APRIL-2021	2.73261	36.97	1.01025	0.62615	61.98							0.62615	
2	MAY-2021	2.59275	35.23	0.91343	0.29448	32.24							0.29448	
3	JUNE-2021	2.36338	37.23	0.87988	0.22746	25.85							0.22746	
4	JULY-2021	2.76083	37.42	1.03310	0.43243	41.86							0.43243	
5	AUGUST-2021	2.71156	37.60	1.01955	0.60263	59.11							0.60263	
6	SEPTEMBER-2021	1.61217	36.21	0.58377	0.42181	72.26							0.42181	
TOTAL		14.77330	36.82	5.43996	2.60496	47.89							2.60496	

Note: (i) Ash means all types of ash including Fly Ash, bottom Ash and Pond Ash etc
(ii) Quantity of ash may be provided in Lakh Metric Ton (LMT) upto five decimal places
(iii) Ash utilisation in Column (6) shall be equal to summation of modes of ash utilisation in each mode i.e. summation of column (8) to column (15)
Abbreviations:- MW-Mega Watt
TPS- Thermal Power Station KM- Kilometre
LMT- Lakh Metric Tonne Kcl- Kilocalories

Green Belt Development

Plantation on 33% land of 487 acre	232.26 acre	Species
Density of plantation	2500 plants/ Hectare	Casurina, peltaform, chitwan, akasia, Mahagoni, Mango,etc
Area required per plant	4.0 SQM	
Total no. of plantation completed	209,772 Nos.	
2019-20	2,600	
2021-22	8224	
Survival rate maintained	< 70%	

CSR

CSR Report

adani
Foundation

(News archive of Corporate Social Responsibility)

Apr'21 to Sep'21

A. Community Health Care

Mobile Health Care Unit (Swasthya Sewa Tuhar Dwar)

Swasthya Sewa Tuhar Dwar Project- free medical check up and treatment at the door steps of the villagers is operational through Mobile Health Care Unit (MHCU)/ Mobile Medical Van daily as per the fixed roaster in the vicinity villages of the plant located at Pussore Block- Bade Bhandar, Chhote, Bhandar, Sarwani, Jevrideeh, Amlibhouna, Barpali, Kotmra, Supa, Taprda, Tupakdhar, Kathli, Bunga, Ranbhata, and Kalma & Chandli villages from Dabhra block of Janjgir Champa district. In the first half of the year from April to September 2021 health check up and



MHCU – Free treatment at the doorsteps of villagers

and treatment were given to 8145 persons. The major disease reported were General Weakness (16.54%), Back Pain (10.46%), Hypertension (8.87%), Fever, Cough & Cold (8.31%), Skin Disorder (7.47%), Gastrointestinal (7.44%), Diabetas Mellites (6.66%). During the health check up medicines has been distributed free to the patients. Total 964 new patients were registered during this month. The MHCU team consists of 01 MBBS Doctor, 01 Pharmacist and 01 Social Protection Officer. The number of village wise persons treated during the month are as follows: -

Sr. No.	Name of Villages	Male	Female	Total
1	Bade Bhandar	307	245	552
2	Chhote Bhandar	368	446	814
3	Amlibhouna	200	221	421
4	Jevridih	112	214	326
5	Sarwani	366	484	850
6	Barpali	365	269	634
7	Kathli	292	240	532
8	Tupakdhar	192	151	343
9	Bunga	461	529	990
10	Ranbhatha	349	298	647
11	Taparda	325	398	723
12	Supa	129	139	268
13	Kotmara	204	136	340
14	Kalma	166	153	319
15	Chandli	169	217	386
Total		4005	4140	8145

Diabetes Check-up by Mobile Health Care Unit

During the 1st half of the year 2021, blood sugar level of 462 people were checked up, out of which the blood sugar level of 213 people were found higher than the normal level (>140mg-dl). After the blood test result, proper consultation was given by our MHCU Doctor and medicines provided. Two home visit conducted for treatment of patient, those were not able to.

Total Test During 1 st Half Year from Apr to Sep. 2021			Total Beneficiaries having Blood Sugar level above the Normal level i.e., 140mg-dl		
Male	Female	Total	Male	Female	Total
187	275	462	88	125	213

Organized National Nutrition Month

National Nutrition Week is celebrated every year from 1 to 7 September, the purpose is to spread awareness about importance of nutrition and to act and address the issues of malnutrition among children, adolescent girls, pregnant women, and nursing mothers. In order to bring Nutrition to the center-stage of the National Development Agenda GOI launched POSHAN Abhiyan in March 2018 as “Poshan Maah”. It aspires to reduce stunting, under-nutrition, low birth weight and anemia and accelerate improvements in nutritional status of target population. With the above objectives, various activities planned and executed from 1 to 7 September



Inauguration of Suposhan Rath (Nutritional Chariot) Sep. 2021

2021 in coordination with ICDS Pussore project of District Women and Child Development department.

SUPOSHAN RATH: - A Suposhan Rath prepared of small vehicle/van covered with health and nutrition related appropriate behavioral messages with IEC audio on Poshan. The rath was flagged off by District Program Officer and District Women & Child Development Officer in presence of ICDS project staffs at Pussore on 01.09.2021. The Rath visited two villages per day from Sep 01 to 07, 2021 and covered 15 villages. During the period organized various activities like Anna Prashan, God Bharai (Baby Shower), Rangoli, Display of nutritional diet in Anganwadi Centres to improve nutritional outcomes for children, pregnant women & nourishing mothers. Nutrition is the science or practice of consuming and utilising foods. Food provides our body with energy, protein, essential fats, vitamins, and minerals to live, grow, and function properly. Therefore, a balanced diet is important for good health and well-being. Hence REGL celebrated and organized many activities to create awareness among people in villages.



Baby Shower Program During Poshan Maah Sep. 21



Anna Prashan Program During Poshan Maah Sep. 2021

Celebrated 'Global Handwashing Day' among school students

Global Handwashing Day (GHD) is celebrated each year on October 15th to increase global awareness of the importance of handwashing with soap. Handwashing with soap and clean water is among the most effective and inexpensive ways to prevent diarrheal diseases and pneumonia,. During the COVID-19 pandemic, personal hygienic practices, especially handwashing with soap, is one of the key life-saving behaviours.



Hand wash Demostration in Govt. Pri School- Jevrideeh

On this day, essay and slogan writing competition was organized in Govt. Higher Secondary and Govt. Middle School of Village Bade Bhandar. Simultaneously, painting competitions were also organized in Govt. Primary schools of village Chhote Bhandar, Amlibhauna, Jewaridih and Sarwani. Along with this, the students studying in all these schools were given the message of cleanliness by washing their hands with soap and clean water. It was explained to the students in all the schools



Essay Writing Competition in Govt. Hr. Sec. School- Bade Bhandar

that we should take care of the cleanliness of hands and especially in the time of corona pandemic we should be more careful.

The closing ceremony of the program was held at Government Higher Secondary School, Village Bade Bhandar. During the program a street play on the concept of "Hand Hygiene" was performed by a group of students. In the above program, the Mr. S. N. Sidar, Principal of the school, Mr. D.S.Jangde In-charge Jan Shiksha Kendra, Mrs. Puspanjali Dashe In-charge -RSS and on behalf of the REGL, Mr. Purnendu Kumar Head -CSR & Coporate Affairs, Mr. Vivek Pandey -Sr. Project Officer and Mr. Parameshwar Gupta -Sr. Assistant -CSr along with all the students and teachers of the school were present. At the end of the program, all the winning participants were awarded by the company.



Prize Distribution in Govt. Pri. School- Sarwani



Prize Distribution in Govt. Pri. School- Chhote Bhandar



Wall Painting Work – Bade Bhandar



Drawing in Govt. Pri. School- Amlibhauna

B. Sustainable Livelihood

Self Employed Tailor Training Course

Self Employed Tailor (SET) training center for skill development of local girls and women was started by CSR department of Raigarh Energy Generation Limited (REGL) in April 2021. The center is located in Bade Bhandar village of Pussore block of Raigarh District. The objective of this course is to make girls and women self-dependent, self-reliant, and entrepreneurial by starting their own tailoring shop and or get employment in apparel industries. The course is based on fixed curriculum, areas in which trainees will be trained are measuring body and garments, drafting garments, cutting garments, stitching garments, finishing garments, operating sewing machines, operating relevant tools and equipment, common problems and maintenance of machines.

Sr. No.	Village	No. of Trainees
1	Bade Bhandar	5
2	Chhote Bhandar	3
3	Amlibhouna	3
4	Jeveridih	4
5	Ranbhattha	2
6	Sarwani	5
7	Tupakdhar	2
8	Taprda	1
9	Barpali	3
10	Bunga	2
Grand Total		30

At present, total 30 girls from 10 different villages are getting training in this tailoring center and a new batch of 45 children is also going to start from next month. The duration of the above course is 3 months. After the completion of the above course, certificate will also be given to all the trained girls by Adani Skill Development Centre (ASDC).



Self Employed Tailor Training Centre, Village - Bade Bhandar, REGL – Raigarh

Organized Meeting (Nos.) of Women Self Help Groups

Self-Help Group (SHG) is a small, self-organized group of impoverished individuals who are preferably from similar socioeconomic backgrounds. They gather together to solve their common difficulties through self-help and mutual assistance. The SHG encourages its members to save money, these savings are deposited at a bank. Self-help groups help in women’s empowerment by making them independent financially and intellectually. CSR team conducted total 154 meeting with Self Help Groups of 08 villages during the first half of the year from April to September 2021. The main objectives of meeting was

Sr. No.	Village	No. of Meeting Held
1	Bade Bhandar	8
2	Chhote Bhandar	16
3	Taparda	32
4	Ambalibhouna	21
5	Kathli	19
6	Jevridih	30
7	Tupakdhar	12
8	Ranbhatha	16
Grand Total		154

to inculcate the habit of regular saving and using banking facilities among the members, documentation and record keeping. During SHG meeting, CSR team also motivated the women in taking collective decision and enhance the confidence and capabilities of the women.



SHG Meeting at village Taparda



SHG Meeting at village Kathli



SHG Meeting



Adani Foundation's Day Observed

The 22nd anniversary day of Adani Foundation was observed with much pomp and show among all stakeholders of the REGL Site. On this occasion Girls of self-employed tailor training organized Rangoli Competition and motivational song competition, community leaders, PRI members took part in multiple programmes which added more fervour to the celebration.

Members of Women Self Help Group's, AWC

Workers, Mitanin of Taprda Panchayat planted medicinal sapling at Kathli village. Simultaneously, the members of SHG also participated in sports with great enthusiasm. A Rangoli competition was conducted among the trainees of Tailor Training at Bade Bhandar self employed tailor tarning center premises. Awareness program on post monsoon diseases organized by MHCU team. Proper counseling and treatment was also provided to the patients through this program.



Health Checkup by MHCU Team - Adani Foundation day



Tree Plantation on Adani Foundation day By SHG



Singing Competition on Adani Foundation day By Trainee Under SET



Ref. No.: REGL/ENV/20-21/ 146

28th September - 2021

The Member Secretary,
Chhattisgarh Environmental Conservation Board
Paryavas Bhavan, North Block, Sector 19, Atal Nagar,
Nawa Raipur, Dist.- Raipur, Chhattisgarh

Sub: Submission of Environmental Statement Report (Form-V) for 600 MW (1x600 MW) coal based thermal power plant at Village-Chhote Bhandar, PO: Bade Bhandar Tehsil : Pussore, District-Raigarh, Chhattisgarh by M/s Raigarh Energy Generation Limited.

Dear Sir,

This has reference to the above subject and General Conditions of the Environment Clearance Letter above cited issued by MoEF & CC, New Delhi. We are hereby submitting Environment Statement Report (Form-V) for the period of April'2020 to March'2021.

Thanking You,

Yours' faithfully,

For, **M/s Raigarh Energy Generation Limited (REGL)**

Rambhav
Gattu

Digitally signed by
Rambhav Gattu
Date: 2021.09.29
17:25:57 +05'30'

[Gattu Rambhav]
Station Head

Encl: As cited above

CC - Regional Officer, Chhattisgarh Environment Conservation Board, TV Tower Road, Raigarh.

Raigarh Energy Generation Limited
(Formerly Known as Korba West Power Company Limited)
Adani Corporate House,
Shantigram, Near Vaishno Devi Circle,
S. G. Highway, Khodiyar,
Ahmedabad-382421,
Gujarat, India
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info@adani.com
www.adani.com

Registered Office: Adani Corporate House, Shantigram, Near Vaishno Devi Circle, S. G. Highway, Khodiyar, Ahmedabad-382421, Gujarat, India.

ENVIRONMENTAL STATEMENT REPORT

(For Financial Year 2020-21)

1×600 MW THERMAL POWER PLANT

At

**CHHOTE BHANDAR VILLAGE, PUSSORE TEHSIL,
RAIGARH DISTRICT, CHHATTISGARH**

Submitted to:

**Chhattisgarh Environment Conservation Board,
Raipur, Chhattisgarh**



Submitted by:

Environment Management Department

Raigarh Energy Generation Limited

**Bade & Chhote Bhandar Village, Pussore Tehsil, Raigarh
District, Chhattisgarh**

ENVIRONMENT STATEMENT FORM-V

(See rule 14)

Environmental Statement for the financial year ending on 31st March, 2021 as per condition stipulated under clause no. xvi of General Conditions in Environmental Clearance granted by Ministry of Environment & Forest vide letter no. J 13012/57/2008-IA.II (T) dated 20th May, 2010.

PART - A

i.	Name and address of the owner/occupier of the industry Operation or Under process.	Mr. Rambhav Gattu Station Head Vill – Chhote Bhandar, PO – Bade Bhandar, Tehsil – Pussore, Distt – Raigarh, Chhattisgarh – 496 100
ii.	Industry category Primary-(STC Code) Secondary – (STC Code)	Red Category
iii.	Production category – Units	1 x 600 MW (600 MW)
iv.	Year of establishment	01 st April 2014
v.	Date of the last environmental statement submitted.	21 th September, 2020

PART - B

i. Water and raw Material Consumption: -

i.	Water consumption in m ³ /day	m ³ /day
a	Process	721.63
b	Cooling	28312.16
c	Domestic	137.77
	Total	29171.57

S. No.	Name of the Products	Water consumption per unit of products	
		During the previous financial year 2019-20	During the current financial year 2020-21
1.	Electricity	0.18 m ³ / MWh	2.54 m ³ / MWh

ii. Raw material consumption

Name of the Raw materials	Name of the Products	Consumption of Raw Material Per Unit of Power	
		During the previous financial year 2019-20	During the current financial year 2020-21
Coal	Electricity	0.77 MT/ MW	0.775 MT/ MW
LDO	Electricity	0.00235 KL/ MW	0.000291 KL/ MW

PART - C

Pollution discharged to environment/unit of output

(Parameter as specified in the consent issued)

SN	Pollutants	Quantity of pollutants discharged (Ton/day)	Concentrations of pollutants in discharges (mg/Nm ³)	Percentage of variation from prescribed standards with reason
a	Water	0.00	0.00	Plant designed is based on zero discharge
b	Air : PM	2.35	41.5	Within the standards of CECB/CPCB
	SO ₂	67.11	1040	Communicated with MoEF & CC regarding time of alignment with CEA phasing plan for achievement of new emission standards.
	NO _x	18.98	345	Communicated with MoEF & CC regarding time of alignment with CEA phasing plan for achievement of new emission standards.

PART - D

HAZARDOUS WASTES

As specified under Hazardous Wastes (Management & Handling Rules, 1989)

S. No.	Hazardous Wastes	Total Quantity (MT)	
		During the previous financial year 2019-20	During the current financial year 2020-21
a.	From Process - Used Oil	46.730 KL	42.08 KL
b.	From Pollution Control Facilities	Nil	Nil

PART - E

SOLID WASTES

S. No.	Solid Wastes	Total Quantity (MT)	
		During the previous financial year 2019-20	During the current financial year 2020-21
a.	From Process (Ash generation)	139,301 MT	852,208 MT
b.	From Pollution Control Facility	Nil	Nil
c.	Quantity recycled or reutilized within the unit.	Nil	Nil
	Sold		
	Disposal (Total Utilization- in brick utilization, cement etc.)	139,610 MT	305,756 MT

Remark: **Unutilized Ash has been stored in ash dyke.**

PART - F

Please specify the characteristics (in terms of concentration and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

1) Hazardous Waste:

Used Oil (Category 5.1) Storage at Site: The waste/used oil generated as part of process was collected in MS drums within Hazardous Waste Storage Shed. The waste is being sold to registered recyclers/ re-processor.

2) Non Hazardous Solid Waste:

- a) Bottom Ash
- b) Fly Ash

Disposal Practices: The waste generated has been disposed in nearby low-lying areas/ stone quarries. Exploring approaches for utilization avenues like infrastructure, highways, cement industries etc.

PART - G

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

- 1) Effluent Treatment Plant had been installed and generated effluent is being traded and using in Ash quenching and dust suppression in AHP and CHP area.
- 2) REGL has installed Sewage Treatment Plants for treating the Domestic sewage and treated water is being used for green belt development.
- 3) Water generated from ash water recovery system (installed Hydrobins) is recycled back in process.
- 4) Regular monitoring of ambient air quality, ground & surface water, noise level quality has been carried out to evaluate the quality of environment in and around the plant premises.
- 5) REGL has installed ESP with efficiency of 99.938% for reducing the emission.
- 6) Bag Filters and Dry fog dust suppression systems have been installed throughout coal handling system for suppression fugitive dust emission.

PART - H

Additional measures/ investment proposal for environmental protection including abatement of pollution.

- 1) System for Harnessing of Solar Power within premises is in process.
- 2) Shifted from CFL to LED's for optimizing electrical energy.

PART - I

Any other Particulars for improving the quality of the environment

- 1) Water sprinkling in dust prone areas in and around plant premises.
- 2) Increasing the density of plants in and around plant premises development of local plant species has been preferred for the plantation having following characteristics.
 - Fast growing with thick canopy cover.
 - Adequate height with longer duration of foliage.
 - Perennial and evergreen
- 3) Integrated housekeeping management has undertaken at top priority to maintain neat, clean, and safe working environment in the plant area.
- 4) Organic waste is being converted to manure and being used in green belt development activities.
- 5) Rain guns and water sprinkling system has been provided in CHP.
- 6) Engaged CII to be Single Use Plastic (SUP) free organization, certification awaited.
- 7) IMS has been implemented for betterment of environment.