



## Power

Ref: APL/REGL/EMD/MoEFCC/EC/211/05/23

Date: 25.05.2023

To,

**Additional Principal Chief Conservator of Forest  
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 Thermal Power Plant at village Chote Bhandar, Bade Bhandar, Sarvani & Amali Bhona in Tehsil Pussore of Raigarh District, Chhattisgarh.**

**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. EC Transfer from Raigarh Energy Generation Ltd. to Adani Power Ltd. dated 24.04.2023.

Dear Sir,

With reference to the above, please find enclosed herewith Six-Monthly Environment Clearance (EC) compliance status report along with environmental monitoring reports as Ambient Air, Water Quality, Noise level, Soil quality, CAAQM data, Met. data, Greenbelt development, Fly ash data & CSR progress report etc. for the period of **October'2022 to March'2023** in soft copy (e-mail).

This is for your kind information and record please.

Thanking You,

Yours faithfully,

**for Adani Power Limited**

**(Santosh Kumar Singh)**

**Head - AESG**

**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**

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

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# SIX MONTHLY COMPLIANCE REPORT OF ENVIRONMENTAL CLEARANCE (EC)

for

**1x600 MW**

**Raigarh Thermal Power Plant**

At

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

*Submitted to:*

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



*Submitted By:*

**Environment Management Department**

**Adani Power Limited**

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

**Period: October'2022 – March'2023**

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**Adani Power Limited, Raigarh**

**Adani Power Limited, Raigarh  
(1x600 MW Coal Based Thermal Power Plant)**

**Introduction**

Adani Power Limited, Raigarh (formerly known as Raigarh Energy Generation 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.

Raigarh Thermal Power Plant has been granted Environmental Clearance by Hon'ble MoEFCC vide letter No. J-13012/57/2008-IA.II (T), dated 20.05.2010 and Amendment of Environment Clearance dated 16.04.2015.

Environment Clearance is transferred from Raigarh Energy Generation Limited to **Adani Power Limited** vide letter no. J-13012/57/2008-IA.II (T), dated 24.04.2023. Under the Hon'ble NCLT vide its order dated 08.02.2023 sanctioning the scheme of amalgamation of Raigarh Energen Limited with Adani Power Limited. Subsequently.

APL, Raigarh 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.

We have 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 Adani Power Limited- Raigarh TPP. The samples were analysed partly at site and partly at their MoEFCC recognized laboratory situated at Gurgaon. This report presents the data generated for the Third & Fourth 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.

**Adani Power Limited, Raigarh**

**Compliance Status on Environment Clearance  
(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 &

EC Transfer from Raigarh Energy Generation Ltd. to Adani Power Ltd. 24.04.2023

Sr. No.	EC Conditions	Compliance Status
<b>A.</b>	<b>Specific Conditions</b>	
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 "M/S Water Solution Pvt Ltd" and report enclosed as <b>Annexure - II</b> . 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 MoEFCC.
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.	Complied. The ground water quality and ground water level monitoring being carried out on regular basis monitoring report is enclosed as <b>Annexure - III</b> .
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.	Complied. 15 MCM Water has been allotted from Mahanadi River by Water Resources Dept. 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.	Noted There is no water body within the power plant premises.
vi	COC of 5.0 shall be adopted.	Being Complied COC of 5.0 is being maintained during plant operation.

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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.	Complied. About 70 Number of local employments has been created which is 36% of total on Roll employees. For contractual side we deployed approx. 340 number 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.	Entire plant area is almost flat. There are no natural 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 MoEF&CC Notification dated 05.09.2022 APL Raigarh TPP is falling under Category "C" Non- retiring TPPs and the timelines for compliance of SO <sub>2</sub> emission is up to December 2026. Accordingly, the work is under progress & shall be completed within the scheduled time.
x	A stack 275 m with flue gas velocity of 25 m/s shall be installed.	Complied. One flue stack 275 meters has been provided and online continuous emission monitoring system (CEMS) installed for PM, SO <sub>x</sub> & NO <sub>x</sub> . Exit velocity is more than 25 m/sec & record are being maintained.
xi	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm <sup>3</sup> .	Complied A High Efficiency Electrostatic Precipitators has been provided (ESP) to meet particulate emission less than 50 mg/Nm <sup>3</sup> . Monitoring report enclosed as <b>Annexure – III</b> .
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.	Complied 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 <sup>th</sup> year of operation of the plant. Status of implementation shall be reported to the Regional Office of the Ministry from time	Complied Fly ash utilization for the period of April '2022 to March'2023 is more than 100%. Fly Ash utilization report is enclosed as <b>Annexure – VII</b> .

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	to time.	
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.	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 <b>Annexure - III</b> .
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, once got approval from concern authority
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 %.	Complied Green belt/plantation is developed in more than 33% of total plant area. Approximate 267,000 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 <b>Annexure - VI</b> .
xviii	Two nearest village shall be adopted and basic amenities like development of roads, Drinking water supply, primary health centre, primary school etc. shall be developed in co-ordination with the district administration.	Complied Four nearby villages are adopted for development of basic amenities such as construction of approach road, community hall, school room, safe drinking water facilities have been completed in all the adopted

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		<p>villages. Pond deepening work has been undertaken in village Bade Bhandar and Sarwani. Tailoring training has been started from September 2022, total trained about 110 during the year.</p> <p>The activities carried earlier are being monitored and sustained by the beneficiaries</p>
xix	<p>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.</p>	<p>Development activities are being carried out in the neighboring villages. Water filter cum cooler has been provided to Govt H S School, Bade Bhandar village.</p> <p>Detailed CSR Progress report enclosed as <b>Annexure-V</b>.</p>
xx	<p>A good action plan for R&amp;R (if applicable) with package for the project affected persons be submitted and implemented as per prevalent R&amp;R policy within three months from the date of issue of this letter.</p>	<p>Complied</p> <p>The project is out of Abadi/population area. The R&amp;R plan has already been prepared, implemented, under progress and submitted to MoEF &amp; CECB, Raipur.</p>
xxi	<p>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.</p>	<p>Being Complied.</p> <p>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 are 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, Sanskritic munch, drinking water facility etc. have been undertaken in the tribal villages for their upliftment.</p> <p>CSR activities are under implementation. CSR report enclosed as <b>Annexure-V</b>.</p>



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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.	Complied. The CSR activities are undertaken through Adani Foundation: 1. Infrastructure development in the villages, 2. Livelihood Enhancement and training, 3. Education, 4. Community Health and Promotion of Sports and Culture. CSR report enclosed as <b>Annexure-V</b> .
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 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.	Various income generating activities were implemented and are under execution. Self Employed Tailor training conducted where 110 girls and women are trained. The company is industry partner for ITI Sariya, where Fitter, Electrician and COPA trade course is under operation. CSR report enclosed as <b>Annexure-V</b> .
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.  For the FY 2022-23 Social audit has been carried out by reputed institute IISWBM, of Kolkata University. Audit report is enclosed as <b>Annexure – IV</b>
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.	Complied. All streetlights have been replaced with Solar & 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	Complied Radioactive analysis carried out by Board of Radiation and Isotope Technology, Department of Atomic Energy, Govt. of India report enclosed in <b>Annexure – VIII</b> .

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	heavy metals in coal and fly ash (including bottom ash) shall be put in place.	
xxvii	Mercury emissions shall also be monitored. on periodic basis.	Complied Analysis report for Mercury emission monitoring stack is enclosed in <b>Annexure - III.</b>
xxix	Fly ash shall not be used for agricultural purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, 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.	Being followed.
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 in more than 33% of total plant area. About 267000 saplings 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 <b>Annexure - VI.</b>
xxxii	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	Complied. We have already established an Environmental Management Cell & Environment Head has direct reported to Senior Management.

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	would be accountable for implementation of environmental regulations and social impact improvement/ mitigation measures	
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 compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.	Complied
<b>B. General Conditions:</b>		
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.	Complied ETP has been established and treated water is being reuse within the premises. The concept of "Zero Liquid Discharge Condition" is implemented. Separate drainage network is established for storm water. Effluent water quality report is enclosed in <b>Annexure - III</b> .
ii	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation.	Complied Sewage Treatment Plants has been installed and the treated effluent is being used for plantation/greenbelt. Analysis report of STP is enclosed in <b>Annexure - III</b> .
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.	Complied A rain water harvesting & recharging system has already been constructed. 04 nos. of rain water 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.	Complied Adequate safety personnel 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	Complied 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.

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	Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.	Disaster management plan (DMP) has been prepared to handle the any eventuality in case of an accident taking place due to storage of oil.
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.	Complied 05 Nos Piezometric wells are established around within the plant premises.
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.	Complied The surface water samples being collected, and analysis report is enclosed as <b>Annexure III</b> .
viii	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	Complied 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.	Complied 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 <sub>2</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> & PM <sub>10</sub> and Hg shall be carried out in the impact zone and records maintained. If at any stage these	Complied Regular monitoring of SO <sub>2</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> & PM <sub>10</sub> CO and Hg is being carried and records

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	levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.	are being maintained during construction phase as well as operational phase. Environmental monitoring report is enclosed as <b>Annexure – III</b> . 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 <a href="http://envfor.nic.in">http://envfor.nic.in</a> .	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. <a href="http://www.adanipower.com">http://www.adanipower.com</a>
xiv	A separate Environment Management Cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards.	Complied. We have already established an Environment Management Cell with well qualified staff for implementation of the stipulated environmental safeguards.

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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 <sub>2.5</sub> & PM <sub>10</sub> ), SO <sub>2</sub> , NO <sub>x</sub> (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.	Complied. Six monthly EC compliance report is being submitted to Regional office, MoEF&CC, CPCB and CECB, Chhattisgarh. The environmental parameters display board provided at main gate of the plant. Previous compliance status was updated in company website.  <a href="http://www.adanipower.com">http://www.adanipower.com</a>
xvi	The environment statement for each financial year ending 31 <sup>st</sup> 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.	Complied The Environment Statement for the year 2021-22 has been submitted to Chhattisgarh Environment Conservation Board (CECB) vide letter no. Ref. No.: REGL/ENV/22-23/35, dated-14/09/2022. Copy of same already submitted to Ministry in previous compliance.
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.	Complied. Six monthly Environmental Clearance compliance status report is regularly submitted to MoEF&CC, CPCB and SPCB. The same is sent by email also. Last compliance report for the period of April'2022 – October'2022 had been submitted to your good office via our latter no. Ref: APL/REGL/TPP/EMD/ MoEFCC/EC/220/11/22. dated- 28.11.2022.
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	Complied

**Adani Power Limited, Raigarh**

	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.																																								
xix	Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. This 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.	<p>Being Complied Last (FY2021-22) year Environmental Protection costs are given below.</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Expenditure Heads</th> <th>Actual Expenditures FY 2021 – 22 (In Lakhs)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Environmental Protection O&amp;M</td> <td>41.84</td> </tr> <tr> <td>2</td> <td>Environmental Monitoring Cost</td> <td>8.35</td> </tr> <tr> <td>3</td> <td>Legal &amp; Consent Fee</td> <td>20.0</td> </tr> <tr> <td>4</td> <td>CSR</td> <td>36.31</td> </tr> <tr> <td>5</td> <td>Environmental Lab Setup</td> <td>22.6</td> </tr> <tr> <td>6</td> <td>Fly Ash Management</td> <td>769.35</td> </tr> <tr> <td>7</td> <td>Greenbelt development</td> <td>60.0</td> </tr> <tr> <td>8</td> <td>Environment Awareness Training</td> <td>1.0</td> </tr> <tr> <td>9</td> <td>Tree Plantation</td> <td>7.2</td> </tr> <tr> <td>10</td> <td>World Environment Day</td> <td>0.30</td> </tr> <tr> <td>11</td> <td>Waste Management at Site</td> <td>4.81</td> </tr> <tr> <td align="center" colspan="2"><b>Total</b></td> <td><b>971.76</b></td> </tr> </tbody> </table>	Sl. No.	Expenditure Heads	Actual Expenditures FY 2021 – 22 (In Lakhs)	1	Environmental Protection O&M	41.84	2	Environmental Monitoring Cost	8.35	3	Legal & Consent Fee	20.0	4	CSR	36.31	5	Environmental Lab Setup	22.6	6	Fly Ash Management	769.35	7	Greenbelt development	60.0	8	Environment Awareness Training	1.0	9	Tree Plantation	7.2	10	World Environment Day	0.30	11	Waste Management at Site	4.81	<b>Total</b>		<b>971.76</b>
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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.																																							
<b>Conditions of EC Amendment Letter</b>																																									
i	The coal shall be transported on road through mechanically covered trucks.	Noted. 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.																																							

**Adani Power Limited, Raigarh**

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.	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.
iii	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, The Road has been recently constructed by NHAI and maintenance of road is being taken care by the company. 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 21<sup>st</sup> May, 2020**

Sl. No.	Condition of Notification	Compliance Status
1)	<p>Setting up technology solution for emission norms</p> <p>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.</p> <p>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.</p>	<p>Noted.</p> <p>i) Technology solutions are being implemented for mitigating fugitive emissions of Particulate Matter.</p> <p>ii) Washeries, middling and rejects are not applicable for this Thermal Power Plant.</p>
2)	<p>Management of Ash Ponds</p> <p>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.</p> <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</p>	<p>i) Noted &amp; 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. Please refer <b><u>Annexure VII</u></b></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 &amp; being complied.</p>



**Adani Power Limited, Raigarh**

	<p>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>iv) Noted &amp; will be complied as &amp; when fly ash is disposed in abandoned or working mines</p>
<p>3)</p>	<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 conveyer 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 conveyer; and</p> <p>b) If transportation by rail or conveyer 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>

\*\*\*\*\*

**F. No. J-13012/57/2008-IA.II (T)**  
Government of India  
Ministry of Environment, Forest and Climate Change  
(Impact Assessment Division)

2<sup>nd</sup> Floor, Vayu Block  
Indira Paryavaran Bhawan  
Jor Bagh Road, Aliganj,  
New Delhi – 110 003

**Dated: 24<sup>th</sup> April, 2023**

To,

**M/s Adani Power Ltd.**  
Adani House, Nr Mithakhali Circle  
Navrangpura, Ahmedabad – 380 009  
Gujarat

**Sub: 1X600 MW Coal based thermal Power plant at villages Chhote Bhandar, Bade Bhandar, Sarvani and Amlı Bhauna, Tehsil Pussore, District Raigarh (Chhattisgarh) - Transfer of Environmental Clearance from M/s Raigarh Energy Generation Limited to M/s Adani Power Ltd. - reg.**

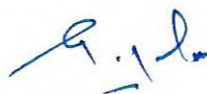
Sir,

This has reference to your online proposal no. IA/CG/THE/297961/2023 dated 25<sup>th</sup> February, 2023 regarding transfer of the environmental clearance for the above said project from M/s Raigarh Energy Generation Limited to M/s Adani Power Ltd.

2. The Ministry had earlier issued environmental clearance for the project 1X600 MW Coal based thermal Power plant at villages Chhote Bhandar, Bade Bhandar, Sarvani and Amlı Bhauna, Tehsil Pussore, District Raigarh (Chhattisgarh) in favour of M/s Korba West Power Company Ltd vide letter dated 20<sup>th</sup> May, 2010, followed by amendment in EC dated 16<sup>th</sup> April, 2015, 26<sup>th</sup> November, 2019 and 30<sup>th</sup> July, 2020 for permission for transportation of coal by road. The said EC was transferred by the Ministry vide letter dated 22<sup>nd</sup> October, 2019 in the name of M/s Raigarh Energy Generation Limited from M/s Korba West Power Company Ltd.

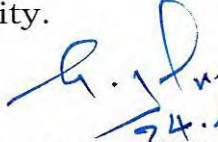
3. M/s Adani Power Ltd has submitted application for transfer of environmental clearance and informed that the Hon'ble NCLT vide its order dated 08<sup>th</sup> February, 2023, sanctioning the scheme of amalgamation of M/s Raigarh Energy Generation Limited with M/s Adani Power Ltd, and thus necessitating transfer of all requisite approvals in the name of M/s Adani Power Ltd. Also, it has informed that M/s Raigarh Energy Generation Limited is wholly owned subsidiary company of Adani Power Ltd.

4. M/s Adani Power Ltd, has submitted an affidavit to abide by the terms and conditions stipulated in the environment clearance dated 20<sup>th</sup> May, 2010, followed by amendment in EC dated 16<sup>th</sup> April, 2015, 26<sup>th</sup> November, 2019 and 17<sup>th</sup> July, 2020 issued in the name of M/s Raigarh Energy Generation Limited.



5. As per the relevant provisions of the EIA Notification, 2006, as amended, the Environmental Clearance granted to the project vide letter dated 20<sup>th</sup> May, 2010 for 1X600 MW Coal based thermal Power plant followed by its further amendments dated 16<sup>th</sup> April, 2015, 26<sup>th</sup> November, 2019 and 17<sup>th</sup> July, 2020, at villages Chhote Bhandar, Bade Bhandar, Sarvani and Amlī Bhauna, Tehsil Pussore, District Raigarh (Chhattisgarh) is hereby transferred from M/s Raigarh Energy Generation Limited to M/s Adani Power Ltd. on the same terms and conditions under which prior environmental clearance was initially granted.

6. This issues with approval of the competent authority.

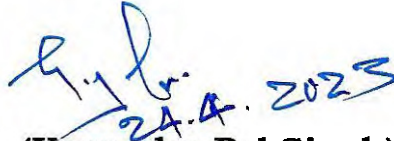
  
24.4.2023  
**(Yogendra Pal Singh)**  
**Scientist 'E'**

Tele: 011-20819364

Email Id: [yogendra78@nic.in](mailto:yogendra78@nic.in)

**Copy to: -**

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi – 110 001.
2. The Chairman, Central Electricity Authority, Sewa Bhawan, R. K. Puram, New Delhi – 110 066.
3. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD cum-Office Complex, East Arjun Nagar, Delhi – 110 032.
4. The Deputy Director General of Forests (Central), Integrated Regional Office, Office Address: Room No 407, Aranya Bhawan, Near CH-3 Circle, Sector 10A, Gandhinagar, Gujarat – 382 010.
5. The Additional Chief Secretary, Forests & Environment Department, Government of Gujarat, Block-14, 8<sup>th</sup> Floor, Sachivalaya, Gandhinagar - 382 010, Gujarat.
6. The Member Secretary, Gujarat Pollution Control Board, Paryavaran Bhavan, Sector - 10A, Gandhinagar – 382 010.
7. The District Collector, Kutch District, City Police Station Rd, Old Umed Nagar, Bhuj, Gujarat – 370 001.
8. Guard file/Monitoring file.
9. Website of MoEF&CC.

  
24.4.2023  
**(Yogendra Pal Singh)**  
**Scientist 'E'**

HYDROGEOLOGICAL REPORT  
OF  
RAIGARH ENERGY GENERATION LTD  
(ADANI POWER LTD)  
RAIGARH, CHHATTISGARH



WATER SOLUTIONS  
GURUGRAM, HARYANA, INDIA

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# Accreditation Board of CGWA

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*Gurugaon, Haryana*

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- Impact Assessment of Existing / Proposed GW Extraction*
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*Certificate No. : CGWA/RGI/011*

*Valid thru : 14.02.2026*

*Dated : 07.07.2021*

क्षेत्रीय निदेशक  
Regional Director  
आरजीएनजीडब्ल्यूटीआरआई  
RGNGWT & RI

सदस्य  
Member  
आरजीएनजीडब्ल्यूटीआरआई  
RGNGWT & RI

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## **1. BACKGROUND**

M/s Raigarh Energy Generation Ltd, previously known as Korba West Power Corporation Ltd a subsidiary of Adani Power, is a power generation company based at village - Chote Bhandar of Pusaur block of Raigarh district, Chhattisgarh state. 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. Raigarh Energy Generation Ltd., is also committed towards the environment and the community it operates in. It has successfully implemented several community welfares 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.

## **2. LOCATION AND ACCESSIBILITY**

The Raigarh Energy Generation Ltd (REGL) plant area falls under village - Chote Bhandar situated in west direction of Pussor block of the Raigarh district, Chhattisgarh state. For the present study, an area by considering 10 km of radius, which comes about 350 sq.km and lies between N 21°38' 37" – 21°49' 57" latitude and E 83°10'16 " – 83°22'37" longitude and falls under the Survey of India Topo-sheet No. 64 O/1, 64O/2, 64O/5 & 64O/6 (1:50000 scale).

The Project site is in the vicinity of the rivers, Mand about 3 km towards west and Mahanadi River about 5 km towards south, on their left banks. The area is well connected by Bituminous Road as well as Rail networks. The surrounding of the projects is connected by Bituminous Road as well as mettle and un-mettle road within 10 km radius. Raigarh Railway station, on Mumbai- Howrah Broad Gauge main line of the South-Eastern-Central Railway is close to the project area around 23 km away. The block head quarter is Pussor & is about 15 km away from the study area on eastern side.

The location map of the project site is given in Fig. 1, 2 & 3

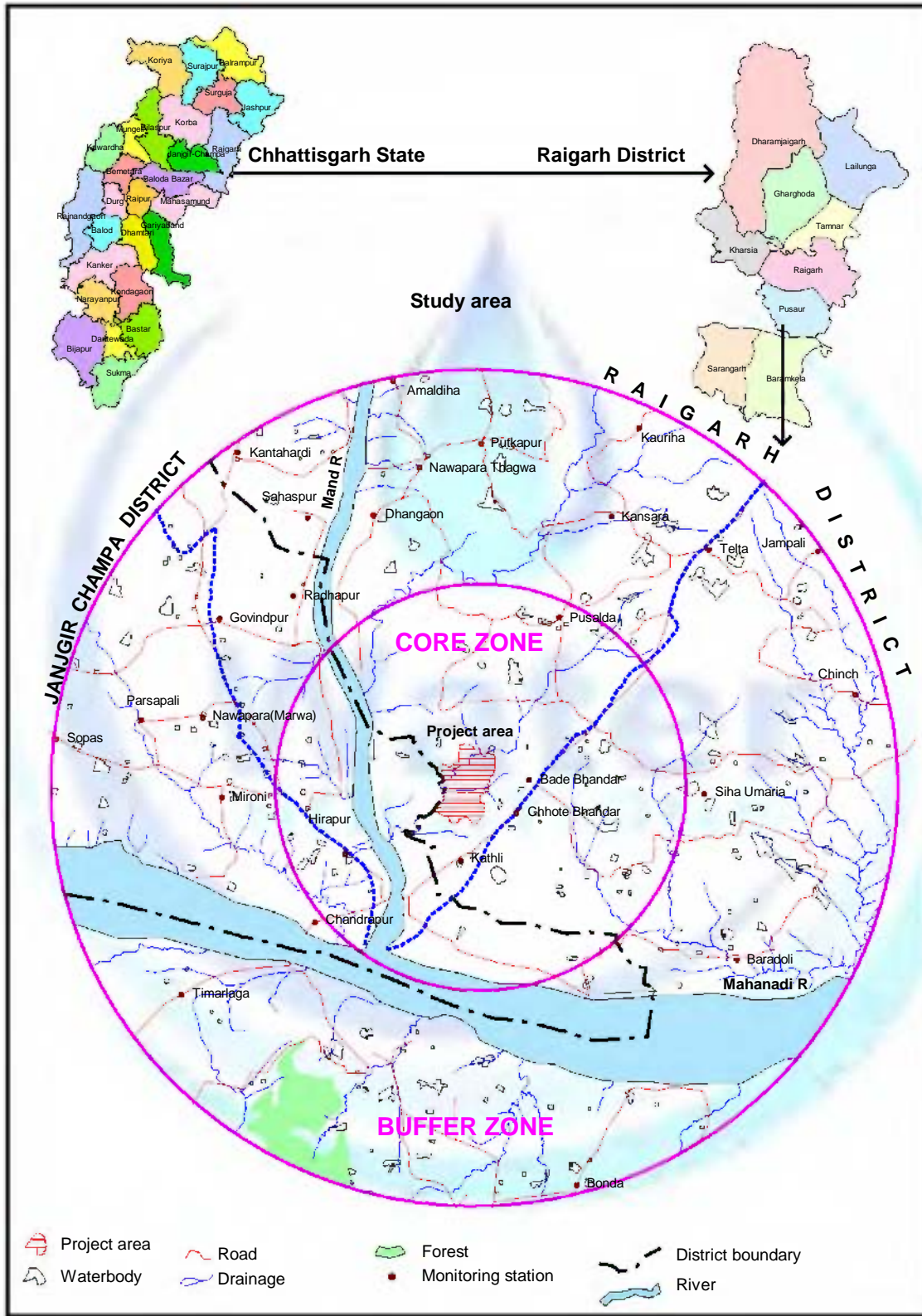


**Fig.1 Location map of the project site, Satellite image (True Color)**





**Fig.2 Location map of the project site with Buffer Zone (Satellite image -True Color)**



**Fig.3 Location map of the project site: Topo sheet map (1:50000)**

### 3. GENERAL DESCRIPTION OF THE AREA

The brief description of the study area is given below.

#### 3.1 Demography

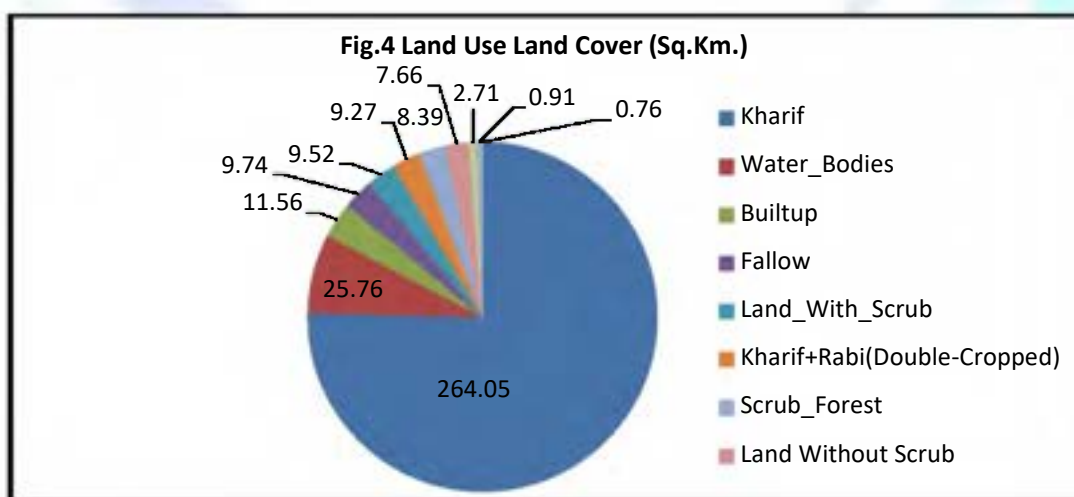
There are 97 nos. of villages present in the area within 10 km of radius. According to Census 2011, the total population of the area is 98489. Out of which 49450 are males & 49039 are female. Schedule Tribe & Schedule Cast population is 22583 & 13394 respectively.

#### 3.2 Land use

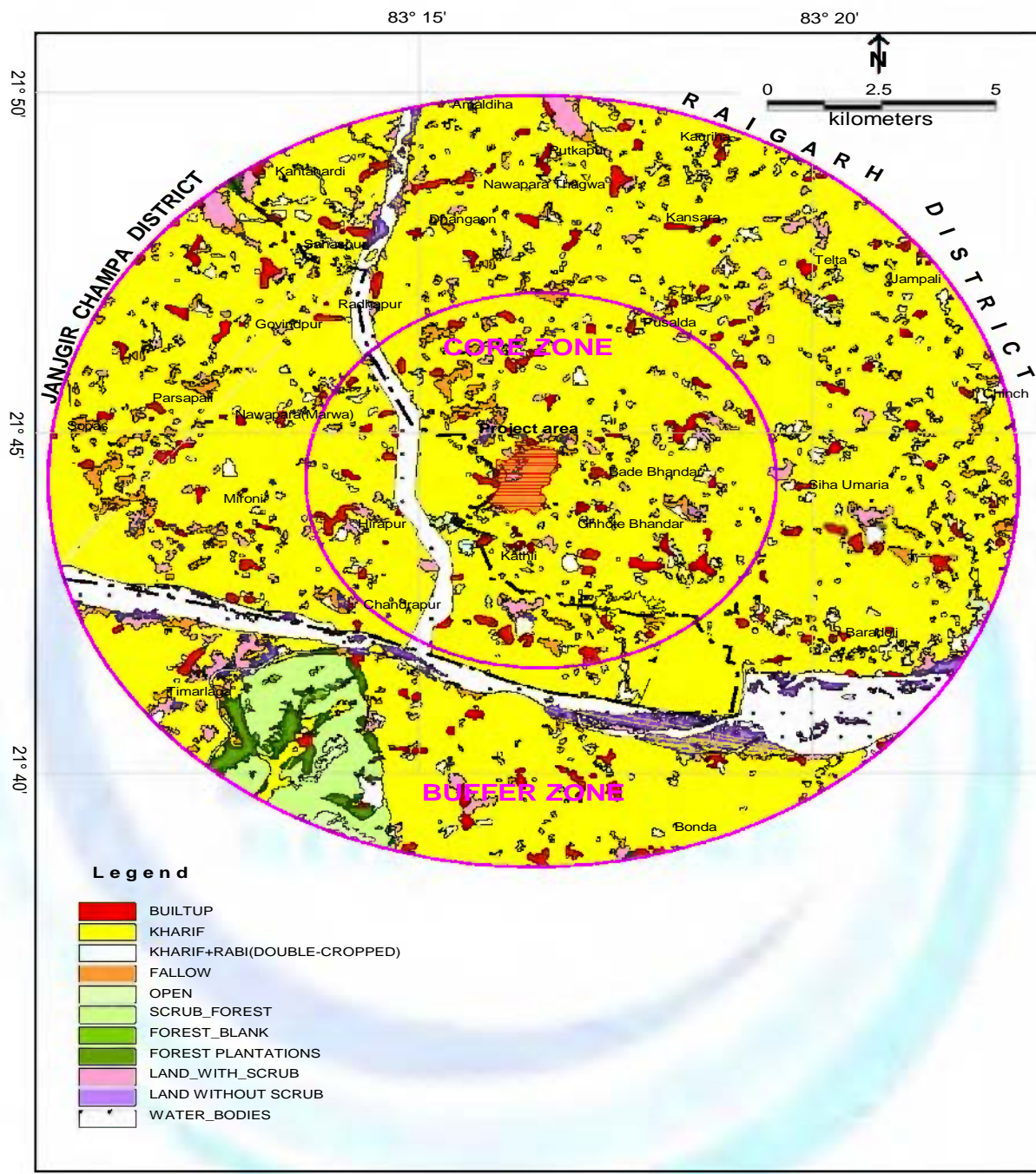
The Satellite Image has been used for Land use study is given in Table no: 1

**Table.1 Land use of the Study area**

Sl. No.	Land Use	Area In Sq.Km.
1	Forest Blank	0.91
2	Scrub Forest	8.39
3	Open	0.76
4	Forest Plantations	2.71
5	Built up	11.56
6	Land with Scrub	9.52
7	Land Without Scrub	7.66
8	Kharif+Rabi (Double-Cropped)	9.27
9	Water Bodies	25.76
10	Kharif	264.05
11	Fallow	9.74
	<b>Total</b>	<b>350.33</b>



**Fig: 4 Land Use Land Cover (Sq. Km.)**



**Fig.5 Land use Map of the Study**



**Fig.6 Sentinel-2 Satellite Image of the Study Area (10 m Resolution)**

### **3.3 Soil**

There are two soil categories are present in the study area namely Ultisols (Red & Yellow soil) and Alfisols (Sandy& Red Sandy soil).

Red & yellow soil (Ultisols) exposed in major part of the study area. It is the ultimate product of continuous weathering of minerals in a humid climate. This is a highly weathered and leached acid soil with high levels of clay below top layer.

Sandy soil (Alfisols) is exposed along river courses of the study area while Red Sandy soil (Alfisols) is exposed in the southern part of the study area in patch. It is a fertile leached soil found in humid areas which is alkaline in nature and contains clay-rich layer.

### 3.4 Climate and Rainfall

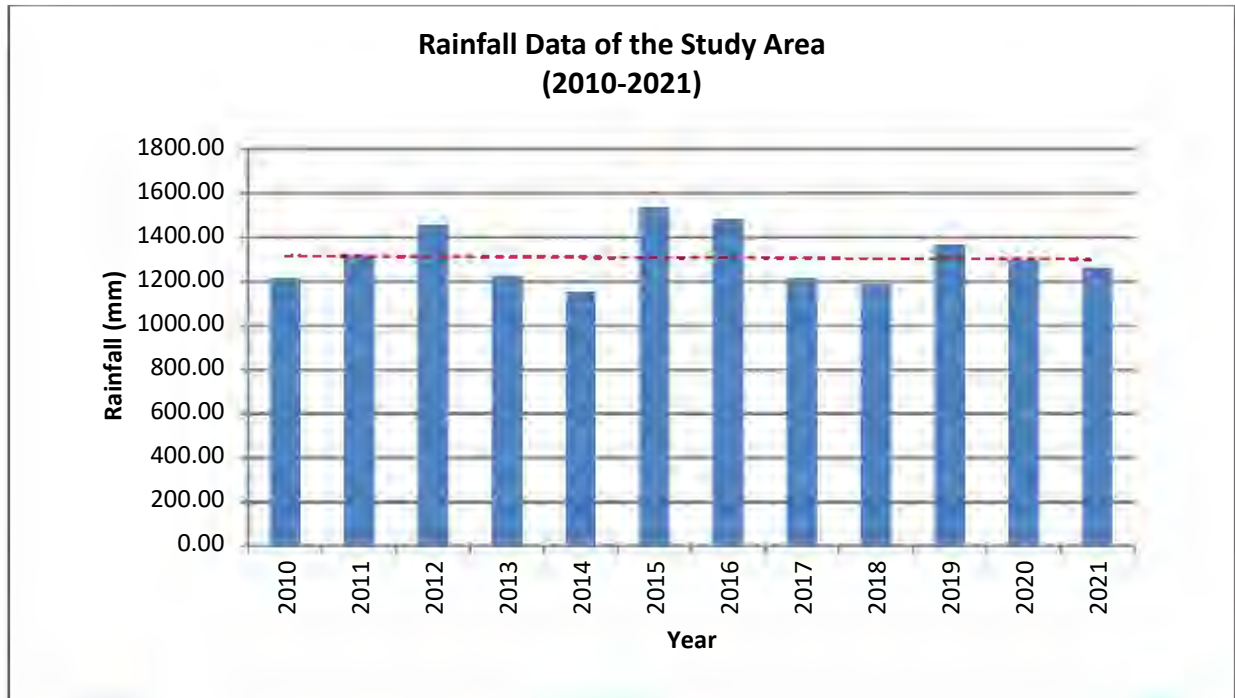
The area falls under tropical climate with hot summer followed by well-distributed rainfall through South-West monsoon season. The winter commences from December and last till the end of February. The period from March to the end of May is hot season. The monsoon season starts from the middle of June and last till the end of September. The average daily annual normal temperature for the area is 32°C. During the summer Season humidity is lowest i.e. about 32% and is highest during the South-West Monsoon period i.e. about 80%.

The study area receives an average rainfall of 1380.80 mm/annum. About 94% of the annual rainfall is received during the Northwest Monsoon period (June to October), of which July and August being the main rainy months. The variation in annual rainfall from year to year is very large. On an average there are 60- 80 rainy days in a year.

Rainfall data of the area for last 12 years is as mentioned in the table no: 2

S. No.	Year	Rainfall ( mm)
1	2010	1212.6
2	2011	1319.6
3	2012	1457.6
4	2013	1224.8
5	2014	1150.2
6	2015	1534.7
7	2016	1484.2
8	2017	1213.5
9	2018	1186.3
10	2019	1367.5
11	2020	1294.12
12	2021	1260.47
Average Rainfall		1308.80

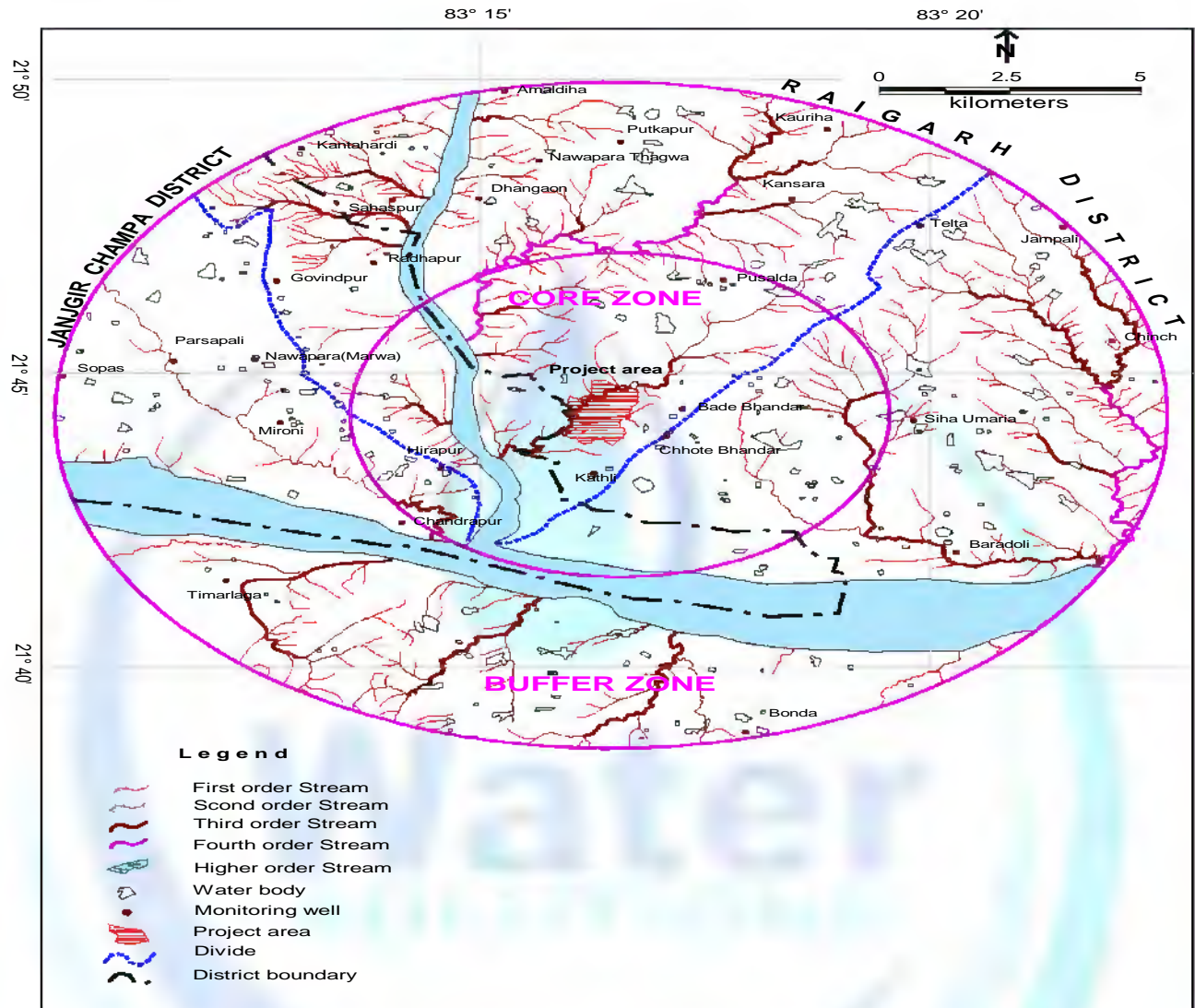
**Table.2 Rainfall data for last 12 years**



**Fig.7 Rainfall Data of the Study Area (2010-2021)**

### **3.5 Drainage**

The area is mainly drained by tributaries of Mand River. This tributary system comes under Mahanadi basin which flows through the study area from 1<sup>st</sup> to 5<sup>th</sup> order. The drainage pattern is dendritic to sub parallel. The drainage density is high especially in hilly area and low in the plain and low lying area. The high drainage density in the upper reaches of the study area indicates high surface run-off and less infiltration of the water while in plain area it indicates less surface run-off and high infiltration.



**Fig.8 Drainage map of the study area**

### 3.6 Geomorphology

Geomorphological the study area is characterized by gently sloping plain land which is classified as structural plain on Proterozoic rocks, structural hills& Valleys and Flood plain. The elevation of the area varies from 200 to 750 mamsl. The Physiography of the basin is controlled by geological formations namely limestone, Shale, sandstone& Conglomerate. The rocks were exposed to renewed post depositional activities and were subjected to intensive and extensive pedimentation, peneplanation and denudation during Pre-Quaternary and Quaternary time. In response to lithology of rocks, their chemical composition, their relative deposition, tectonic set up, they were chiselled into various geomorphic and hydro geomorphic surfaces namely structural plain on Proterozoic rocks, structural hills& Valleys and Flood plain.





**Fig.9 Geomorphological Map of the study area**

## 4. GEOLOGY

### 4.1 Stratigraphic Sequence

The area mainly covers the rocks Chandrapur, Gunderdehi, Raigarh & Chandi Formations of Chhattisgarh Super Group of Proterozoic in age. The generalised geological succession in the area as per Geological Survey of India is given below in the form of Table 4.1.

**Table 3: Generalized geological succession in Raigarh district**

Age	Period	Group	Formation	Lithology
Quaternary	Recent to sub-recent		Alluvium & laterite	Sand, silt, clay, lateritic soil
Cenozoic			Rhyolite(intrusive)	
Proterozoic		Raipur Group	Saradih	Dolomite
			Bamnidi	Shale & Limest.
			Chandi	Lime st. & Shale
			Raigarh	Shale, Limest., Arenite & Conglomerate
			Gunderdehi	Shale
		Charmuria	Lime st. & Shale	
		Chandrapur Group	Orthoquartzite to Sub-arkosic Sandstones	
Archaean	Bilaspur-Raigarh-Surguja belt, Metamorphic & Igneous rock (Basement Crystallines)		Granites, gneiss, mica schists with quartz vein & pegmatite	

### 4.2 Geological formation of the area

#### 4.2.1 Chandrapur Group

The Chandrapur Formation is exposed in south part of the study area in small patch. It mainly consists of conglomerate, arkose, sub-arkose, chert and fine-grained ferruginous arenite. Black shale varies laterally on either side to pink and light grey shale. The intercalated arenite is fine grained containing asymmetric ripple marks.

#### 4.2.2 Raipur group

##### a) Gunderdehi Formation:

The Gunderdehi Formation It is exposed in south-western part of the study area in small patch. Charmuria Formation is conformably overlain by Gunderdehi Formation, which is dominantly a calcareous argillite developed as a distinct facies in the sub-basin. Although

the purple-coloured shale with intercalated limestone is the dominate member, a buff-coloured shale and a ferruginous arenite are also two prominent members occurring at the middle of the formation.

The purple shale is generally calcareous, highly friable in character and is associated with impersistent limestone bands. Locally intra-formational conglomerate lenses are present in the upper part. Besides this, lenses and pockets of stromatolitic limestone appearing towards top indicate a gradational contact with the overlying formation. It is reported that at subsurface Gunderdehi purple shale grades to black shale.

**b) Raigarh Formation:**

The formation is developed in major part of the study area comprising dominantly friable calcareous purple shale with limestone intercalations. The formation can be classified into a lower shale flaggy carbonate-arenite member which is followed upward by a purple calcareous shale member. At places, arenite lenses and bands are also present in the member. The upper member is mainly purple calcareous shale with limestone as well as arenite lenses. Mud cracks and ripple marks are the common structures.

**c) Chandi Formation:**

It is also exposed in south-western part of the study area in small patch. This comprises a major stromatolitic limestone sequence consist of limestone and shale. The carbonate facies is intercalated discrete pockets or lenses in calcareous argillite. Chandi Formation had been classified into four major carbonate members as Newari, Pendri, Deodongar and Nipania Member.

The geological map of the study area is given in **Fig.10**

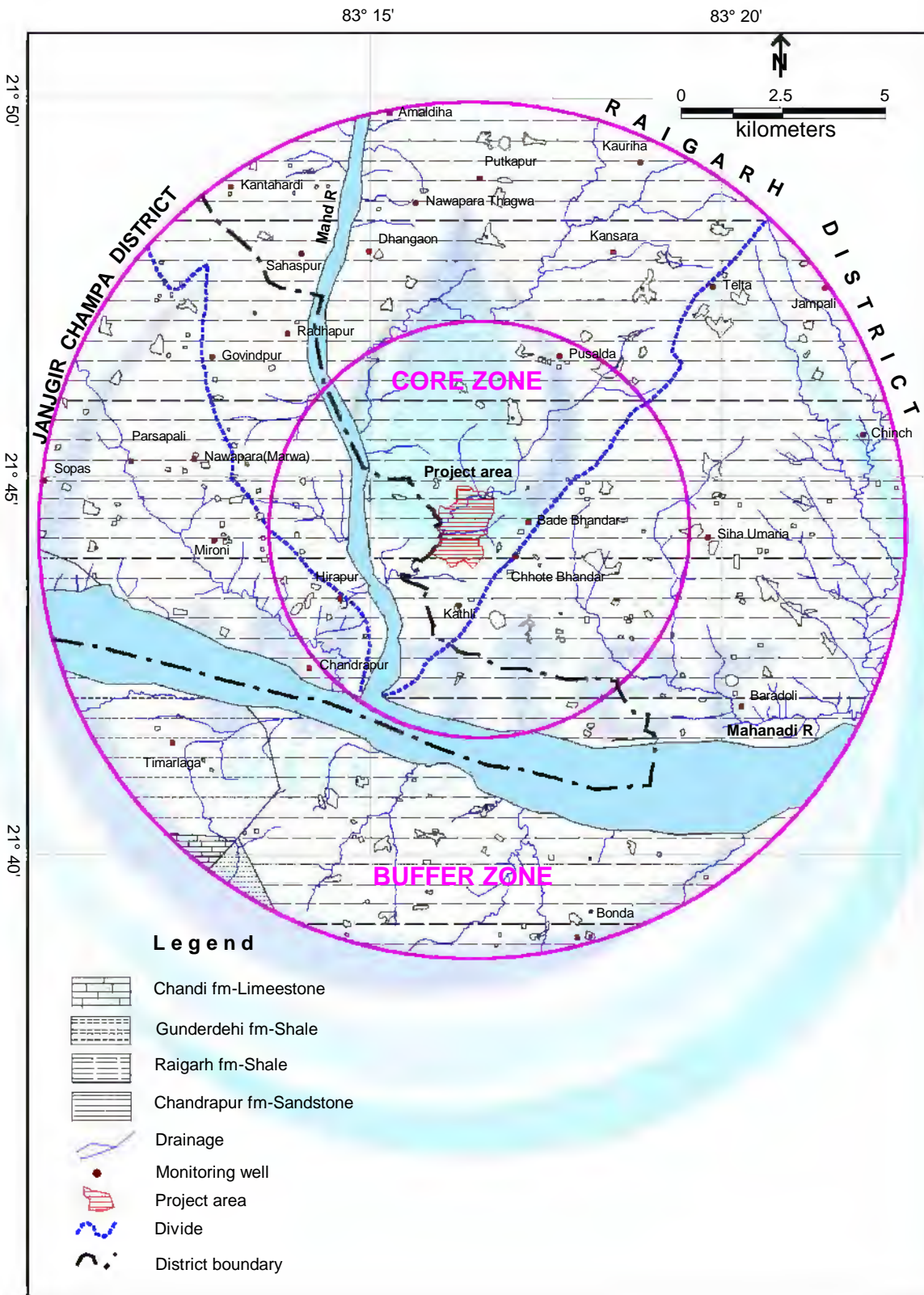


Fig 10 Geological map of the Study area

## **5. HYDROGEOLOGY**

### **5.1 Introduction**

The ground water occurrence and its distribution in space are highly influenced by the underlying geological formations and hydro-geological characteristic of the surroundings. The weathered and fractured zones present in the rocks or formation provides scope of ground water occurrence, storage and its movement. The hydrogeology of the area broadly describes the disposition of water bearing formations occurrence of ground water and their yield potential, groundwater regime conditions, depth to water levels in different seasons, yield potential of the aquifers etc.

### **5.2 Ground water occurrence and Aquifer systems**

In the area, ground water occurs under phreatic or unconfined condition in weathered portion of rocks and semi-confined to confined conditions in fractures/cavernous part of rocks i.e. limestone and shale at depths.

The shallow aquifers of the study area occur within an average depth of 20 m. They are composed of weathered mantle. The configuration of water table in the shallow aquifer follows the topography due to which the ground water movement is generally towards valleys or topographic low. The recharging bodies such as tanks, canals and streams also influence the occurrence and movement of ground water in shallow aquifers. The shallow aquifers of the area are mostly developed by way of dug wells in the area whose depth varies from 7 to 16 m. In general, the yield of dug wells ranges from 25 to 40 m<sup>3</sup>/day.

### **5.3 Pumping Test**

A pumping test is one of the most useful means of determining hydraulic properties of water-bearing layers and confining beds, and important for a proper understanding of some groundwater system to evaluate groundwater as a water supply. The aquifer was pumped at a constant discharge rate of about 3870 m<sup>3</sup> /day. Amongst different analytical methods, it is important to select numerical formula which is more appropriate to actual field conditions. Hydrogeologists and engineers have developed several theoretical models over the past century to analyze and evaluate pumping test data. These methods for analyzing groundwater flow in bounded aquifers is based on the principle of superposition. According to this principle, the drawdown induced by two or more wells is equal to the sum of the drawdowns caused by each separate well. Therefore, by introducing imaginary wells, or image wells, it is possible to transform an aquifer of finite extent into one of seemingly infinite extent.

Pumping Test was conducted at Village- Chote Bhandar, Private Borewell. The static water level observed is 6.45m, drawdown observed is 7.64m after 100minutes of pumping. The analysis is explained in the following section.

To apply the Cooper and Jacob solution, plot  $S_s$  as a function of  $\log t$  on semi-logarithmic axes and draw a straight line through the data and the equation to Determine T is given below:

$$T = 2.303 / Q4\pi\Delta s$$

$\Delta s$  is the slope of the fitted line (change in drawdown per log cycle time) With the estimate of T obtained from, calculate Ss as follows:

$$S = 2.25Tt_0 / r^2$$

Where

Q is pumping rate [ $L^3/T$ ]

r is radial distance from pumping well to observation well [L]

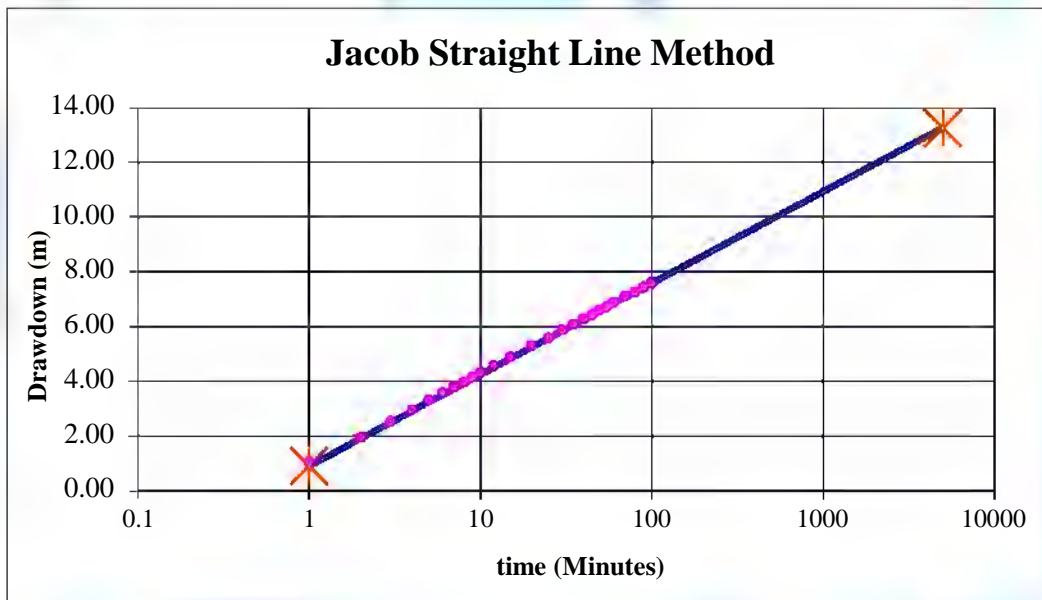
s is drawdown [L]

S is storativity [dimensionless]

t is elapsed time since start of pumping [T]

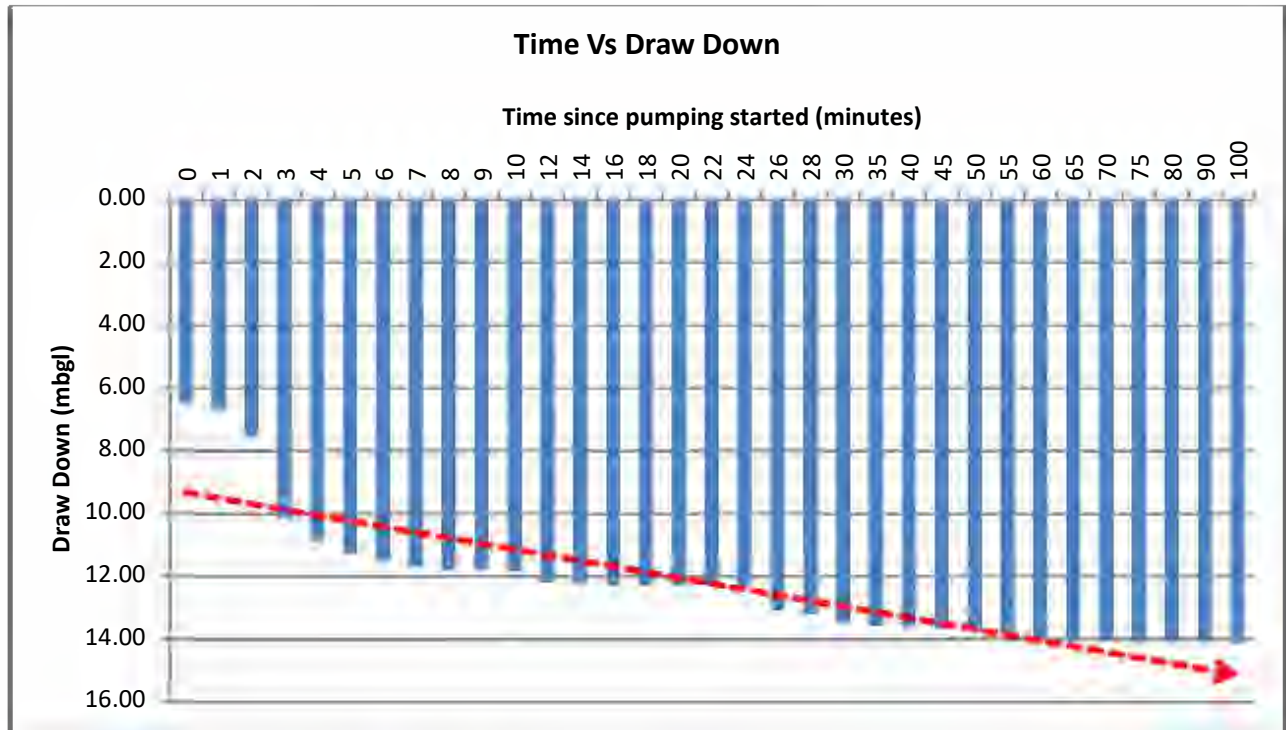
T is transmissivity [ $L^2/T$ ]

w(u) is the Theis well function for nonleaky confined aquifers [dimensionless]

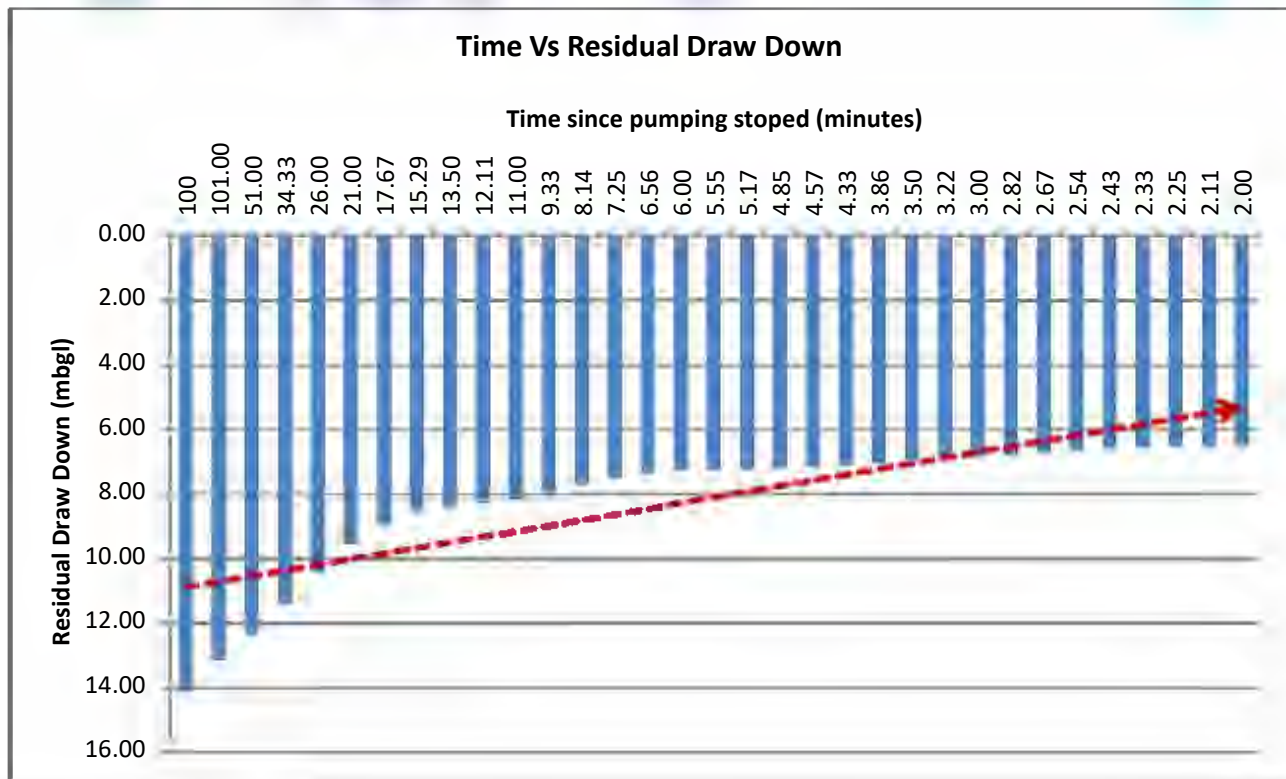


**Fig: 10 Jacob straight line Method**

Based on the pumping test data analysis the transmissivity (T) value observed from the study is 23.71 m<sup>2</sup>/day, Storage value obtained from the aquifer test is 3.84x10<sup>-05</sup>



**Fig: 11 Time Vs Draw Down**



**Fig: 12 Time vs Residual draw down**

**Table no 4: Data collected during the pumping test**

Pumping			Recuperation				Residual Draw Down
Time in minutes since pumping started	Water level in m bmp	Drawdown	Time since pump started t (min)	Time since pump stopped t` (min)	t/t`	Water level in m	
0	6.45	0.00	100	0	0	14.09	7.64
1	6.68	0.23	101	1	101.00	13.14	6.69
2	7.56	1.11	102	2	51.00	12.36	5.91
3	10.14	3.69	103	3	34.33	11.39	4.94
4	10.84	4.39	104	4	26.00	10.39	3.94
5	11.25	4.80	105	5	21.00	9.54	3.09
6	11.5	5.05	106	6	17.67	8.97	2.52
7	11.65	5.20	107	7	15.29	8.53	2.08
8	11.78	5.33	108	8	13.50	8.41	1.96
9	11.79	5.34	109	9	12.11	8.25	1.80
10	11.81	5.36	110	10	11.00	8.14	1.69
12	12.16	5.71	112	12	9.33	8.03	1.58
14	12.20	5.75	114	14	8.14	7.68	1.23
16	12.26	5.81	116	16	7.25	7.47	1.02
18	12.26	5.81	118	18	6.56	7.33	0.88
20	12.27	5.82	120	20	6.00	7.24	0.79
22	12.27	5.82	122	22	5.55	7.24	0.79
24	12.27	5.82	124	24	5.17	7.22	0.77
26	13.06	6.61	126	26	4.85	7.20	0.75
28	13.19	6.74	128	28	4.57	7.15	0.70
30	13.45	7.00	130	30	4.33	7.09	0.64
35	13.56	7.11	135	35	3.86	7.04	0.59
40	13.59	7.14	140	40	3.50	6.91	0.46
45	13.64	7.19	145	45	3.22	6.86	0.41
50	13.68	7.23	150	50	3.00	6.84	0.39
55	13.83	7.38	155	55	2.82	6.79	0.34
60	13.94	7.49	160	60	2.67	6.68	0.23
65	14.01	7.56	165	65	2.54	6.61	0.16
70	14.05	7.60	170	70	2.43	6.57	0.12
75	14.06	7.61	175	75	2.33	6.53	0.08
80	14.06	7.61	180	80	2.25	6.51	0.06
90	14.08	7.63	190	90	2.11	6.50	0.05
100	14.09	7.64	200	100	2.00	6.48	0.03



### 5.4 Water table configuration and flow direction

The ground water flow direction follows broadly the topographic pattern, in northern part of the study area, it is in east-west and in southern part of the study area and it is in north-south direction indicating the major surface water divides in the central portion of the study area N-S & E-W and two local water divides NW-SE & NE-SW. A local variation in flow direction is also observed in the vicinity of surface water divide. The water table elevation in the study area ranges between 190 to 200mamsl. Eastern & southern part of the area is having high altitude of water table elevation i.e. 200mamsl while water table elevation decreases to south-eastern & is 190mamsl. The gradient of water table is variable. Ground water divide has been demarcated based on the field data as shown in Hydrogeological map, Fig. 5.1.

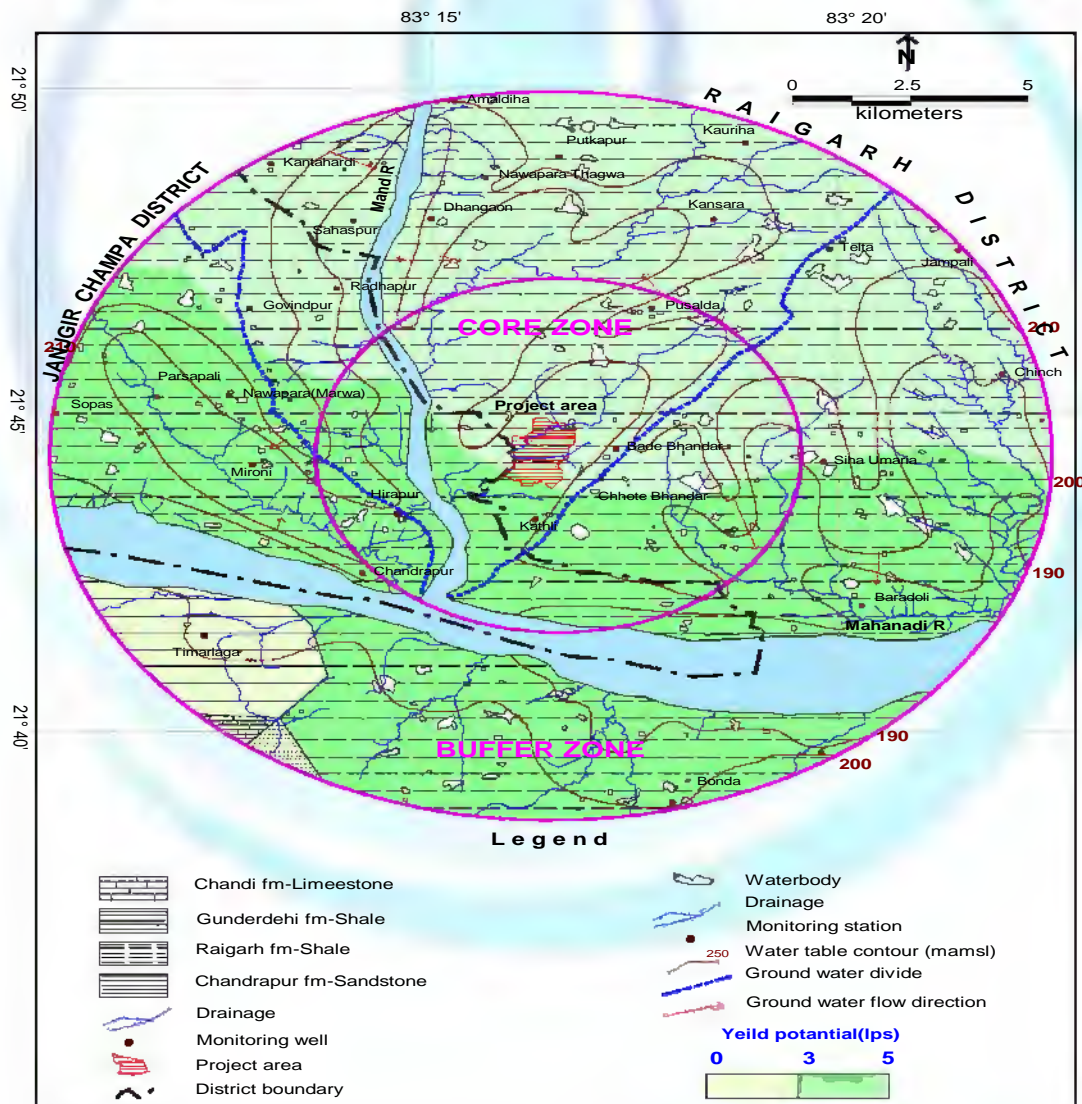


Fig. 13 Hydrogeological map

## 6 GROUND WATER REGIME MONITORING

### 6.1 Introduction

The monitoring data will be of immense helpful in management of the water resources as well as protecting the ground water storage. Such study envisages regular monitoring of water level at selected locations to observe the variation of the ground water level and the changes in water quality with respect to ground water withdrawal over a period of time and space. It is pertinent to say that any ground water development of a particular area would bring changes in the immediate vicinity of the development area.

The objective is to identify the potential areas that have registered change in ground water levels and quality which in turn would help in identifying the appropriate measures for adoption of artificial recharge to neutralize the negative impact of the envisaged ground water development. In the present report, the monitored data has been presented and the overall picture of ground water storage behaviour due to continuous abstraction of ground water has been analysed for the January 2010 to November 2021. The monitoring was carried out four times in each year i.e. January May, August and November. The water level data of the month of May and November are taken as level of pre-monsoon and post-monsoon respectively.

### 6.2 Distribution of monitoring stations

To study the change in ground water regime in and around study area, a total of 27 monitoring wells (DW & BW) were selected at different locations for regular monitoring of ground water level (Core zone- 4 nos., Buffer zone-23nos.The monitoring schedule undertaken in and around the plant area has been bifurcated in core and buffer zone to have a better understating about the changes that is being observed in the ground water regime. The separate analysis of the long term ground water behaviour in core and buffer zone would enable to demarcate the areas that bear direct impact of any ground water development that has triggered its impact in the surrounding areas has also been discussed in subsequent headings. The basic details of these monitoring wells are presented in **Table Nos.5**

**Table 5: Basic details of established monitoring wells in the Core Zone**

Sl No	Location	Lat	Long	Type of well	Dia in (m)	Depth in (m)	RL (m amsl)
1	Bade Bhandar	21.739360	83.289519	Borewell	0.15	82	217
2	Chhote Bhandar	21.731270	83.282079	Borewell	0.15	85	218
3	Amlibhouna	21.725683	83.268322	Borewell	0.15	100	237
4	Jevridih	21.732607	83.285202	Borewell	0.15	95	215
5	Barpali	21.747425	83.293045	Borewell	0.15	90	244

6	Gopalpur	21.738151	83.225732	Borewell	0.15	80	204
7	Kotmara	21.758395	83.273520	Borewell	0.15	85	231
8	Supa	21.751738	83.299698	Borewell	0.15	95	227
9	Taparda	21.720197	83.284497	Borewell	0.15	100	229
10	Kotasura	21.745560	83.334827	Borewell	0.15	80	220
11	Kathali	21.723253	83.271810	Borewell	0.15	86	238
12	Bunga	21.726707	83.300077	Borewell	0.15	75	214
13	Ranbhata	21.718512	83.293932	Borewell	0.15	90	228
14	Kalma	21.700327	83.274772	Borewell	0.15	75	212
15	Chandli	21.713263	83.259052	Borewell	0.15	70	212
16	Chandarpur	21.710450	83.237630	Borewell	0.15	85	207
17	Nandeli	21.760950	83.336739	Borewell	0.15	80	224
18	Gotma	21.740673	83.361387	Borewell	0.15	90	216
19	Basanpali	21.812959	83.290373	Borewell	0.15	95	223
20	Latesara	21.743418	83.191503	Borewell	0.15	85	207
21	Borsi	21.771609	83.229350	Borewell	0.15	72	204
22	Dadarpali	21.660214	83.257402	Borewell	0.15	70	209
23	Naughata	21.664786	83.289977	Borewell	0.15	78	201
24	Parsapali	21.701567	83.346822	Borewell	0.15	85	204
25	Tetala	21.790384	83.329855	Borewell	0.15	90	225
26	Semra	21.760510	83.254302	Borewell	0.15	85	224
27	Dhangaon	21.812103	83.259367	Borewell	0.15	85	216
28	Timarlaga	21.694123	83.203903	Borewell	0.15	70	198
29	Kawriha	21.818007	83.310533	Borewell	0.15	90	212
30	Ruchida	21.795896	83.278562	Borewell	0.15	85	217

## 7. ANALYSIS OF WATER LEVELS

### 7.1 Introduction

Water level or piezometric heads is the resultant of all the input and output to the ground water reservoir, considering it to behave as a system with defined boundaries. Ground water is a dynamic system. The variables required to be monitored, namely water level or head, chemical quality are subject to changes both due to natural and manmade causes. The zones of aeration and saturation play important roles in ground water recharge and ground water level fluctuations, as also in evolution of its quality. Hence assessment of chemical quality and temperature monitoring are essential parts of the monitoring system.

### 7.2 Ground water levels:

The configuration of the water table depends upon by topography, geology, climate, water yielding and water bearing properties of rocks in the zones of aeration and saturation, which control ground water recharge. The upper surface of the zone of saturation is the water table. In case of wells penetrating confined aquifers, the water level represents the

pressure or piezometric head at that point. The water level is dependent on static or time independent topographical features and also Dynamic or time- dependent variables.

Monitoring network planning is basic to groundwater assessment and development programmed. The groundwater, being subterranean resource can only be accessed through the indirect reflection in the form of water level fluctuations. The systematic and regular monitoring of groundwater levels can bring out the changes taking place in the regime. The data so generated are of immense help for regional groundwater flow modeling to serve as a groundwater management tool, and to provide the necessary advance information to the user agencies to frame contingency plans in case of unfavorable groundwater recharge situation.

The seasonal water levels in different years have been collected, analyzed for every set of measurements and write up with maps are presented in following sections. It is observed that in the study area major surface water divides are present in central part of the study area extending N-S & E-W. Hence, for the analysis part of Bade Bhandar, ChoteBhandar, Kathli and Pusalda villages of core zone and Amaldiha, Baradoli, Chinch, Dhangaon, Jampali, Kansara, Kauriha, Nawagaon Thangwa and Putkapur of buffer zone have been considered.

### 7.2.1 Analysis of water levels

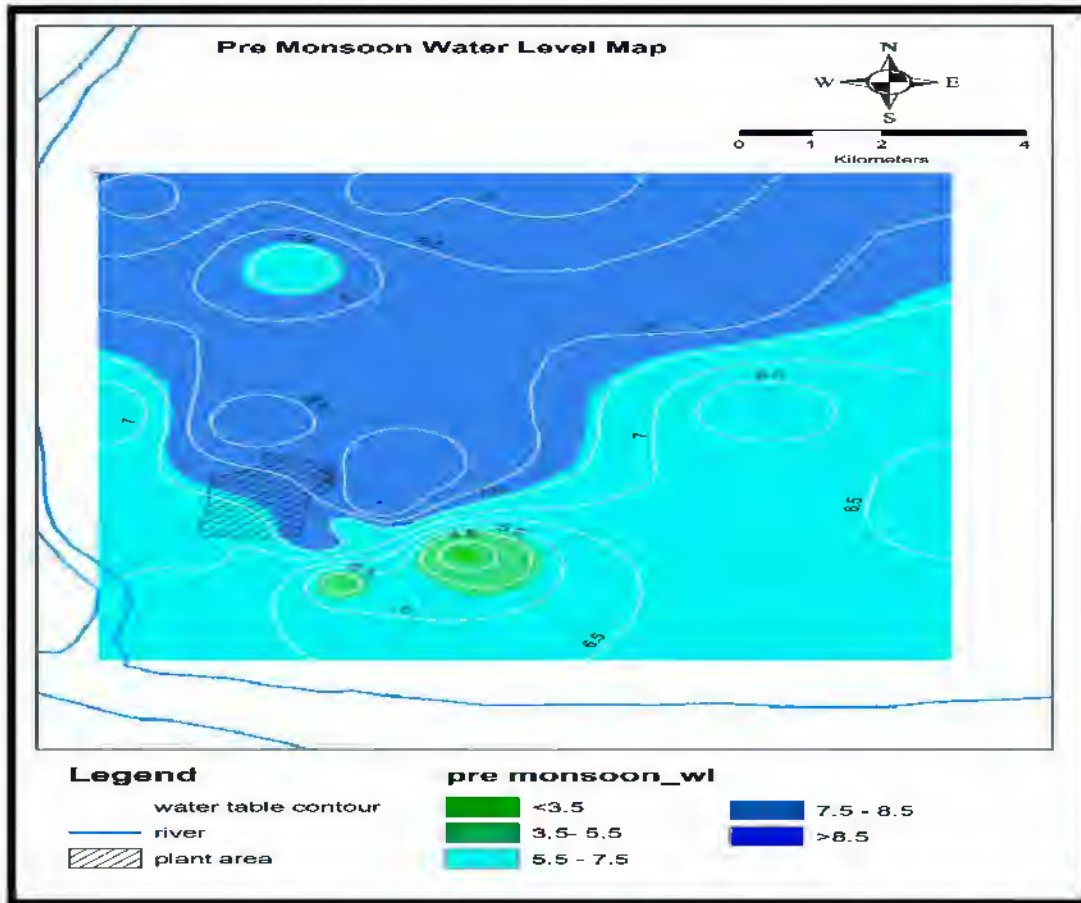
The water level data collected four times during the year 2022 from the observation wells in core zone as well as buffer zone is presented in **Table No.6**

Sl No	Location	Lat	Long	Pre Monsoon Water Level (mbgl)	Post Monsoon Water Level (mbgl)	Fluctuation (m)
1	Bade Bhandar	21.739360	83.289519	9.5	6.8	2.7
2	Chhote Bhandar	21.731270	83.282079	8.45	7.19	1.26
3	Amlibhouna	21.725683	83.268322	7.15	6.45	0.7
4	Jevridih	21.732607	83.285202	6.95	5.75	1.2
5	Barpali	21.747425	83.293045	9.5	6.5	3
6	Gopalpur	21.738151	83.225732	6.45	5.85	0.6
7	Kotmara	21.758395	83.273520	9	7.45	1.55
8	Supa	21.751738	83.299698	8.5	7.75	0.75
9	Taparda	21.720197	83.284497	5.15	3.35	1.8
10	Kotasura	21.745560	83.334827	7	6.1	0.9

11	Kathali	21.723253	83.271810	6.5	5.65	0.85
12	Bunga	21.726707	83.300077	3.5	1.45	2.05
13	Ranbhata	21.718512	83.293932	5.8	4.35	1.45
14	Kalma	21.700327	83.274772	5.95	5.15	0.8
15	Chandli	21.713263	83.259052	9.65	8.35	1.3
16	Chandarpur	21.710450	83.237630	7.1	5.5	1.6
17	Nandeli	21.760950	83.336739	6	4.95	1.05
18	Gotma	21.740673	83.361387	6.15	5.5	0.65
19	Basanpali	21.812959	83.290373	9.15	7.65	1.5
20	Latesara	21.743418	83.191503	5.46	4.85	0.61
21	Borsi	21.771609	83.229350	5	4.5	0.5
22	Dadarpali	21.660214	83.257402	6.4	5.12	1.28
23	Naughata	21.664786	83.289977	5.5	4.78	0.72
24	Parsapali	21.701567	83.346822	6.9	5.74	1.16
25	Tetala	21.790384	83.329855	8.5	6.45	2.05
26	Semra	21.760510	83.254302	6.45	5.94	0.51
27	Dhangaon	21.812103	83.259367	9.1	8.4	0.7
28	Timarlaga	21.694123	83.203903	6.3	5.18	1.12
29	Kawriha	21.818007	83.310533	9.4	8.5	0.9
30	Ruchida	21.795896	83.278562	7.2	6.34	0.86

### 7.2.1.1 Pre-monsoon Depth to Water level (May'2022)

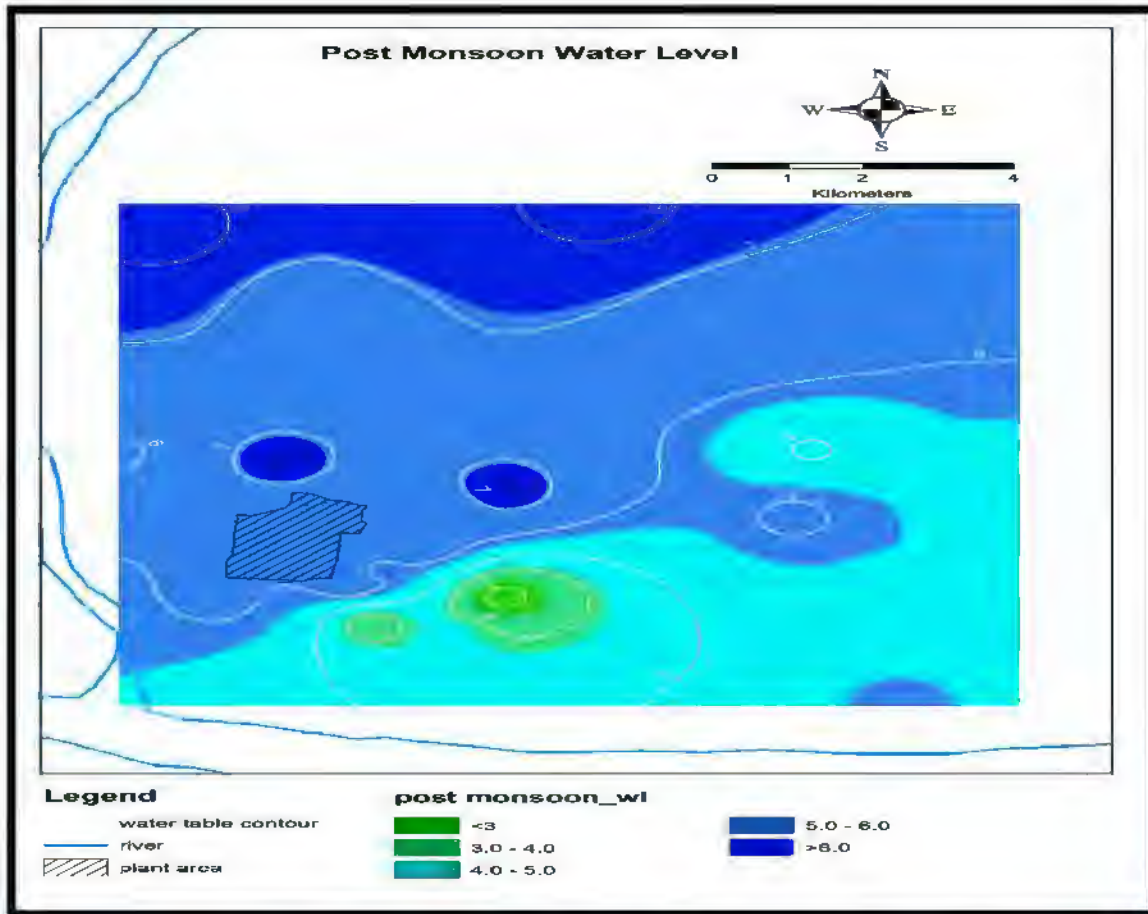
The depth to water level map has been prepared based on ground water monitoring data of May 2022. From the perusal of Table 7.1, it is observed that the overall depth to water level in area remains between 3.50 to 9.65 meters below ground level in core and buffer zone. The lowest water level observed at Village Bunga and Maximum water level observed at Chandli are 3.5 & 9.65 mbgl respectively. The pre monsoon water level map study is given below at Fig. 7.



**Fig: 14 Pre Monsoon water Level map**

### 7.2.1.2 Post-monsoon Depth to Water level (November'2022)

The depth to water level map has been prepared based on ground water monitoring data of November 2022. From the perusal of the Table 7.1, it is observed that the overall depth to water level in area remains between 1.45 to 8.5 meters below ground level in core and buffer zone. The minimum post-monsoon depth to water level is observed at the village Banga and maximum at village Chandli. The post monsoon depth to water level map is given below Fig. 15.



**Fig: 15 Post Monsoon water Level map**

### **8. GROUND WATER FLUCTUATION:**

The difference between pre and post monsoon water level of the year is most important seasonal fluctuation which gives a clear picture of ground water potential which can be utilized for various uses over succeeding year. The fluctuation is used to evaluate the dynamic ground water resources through the change in ground water storage. The water level fluctuation between pre and post monsoon period is generally is in the range of 0.5 to 3.0 m with an average fluctuation 1.2 m.

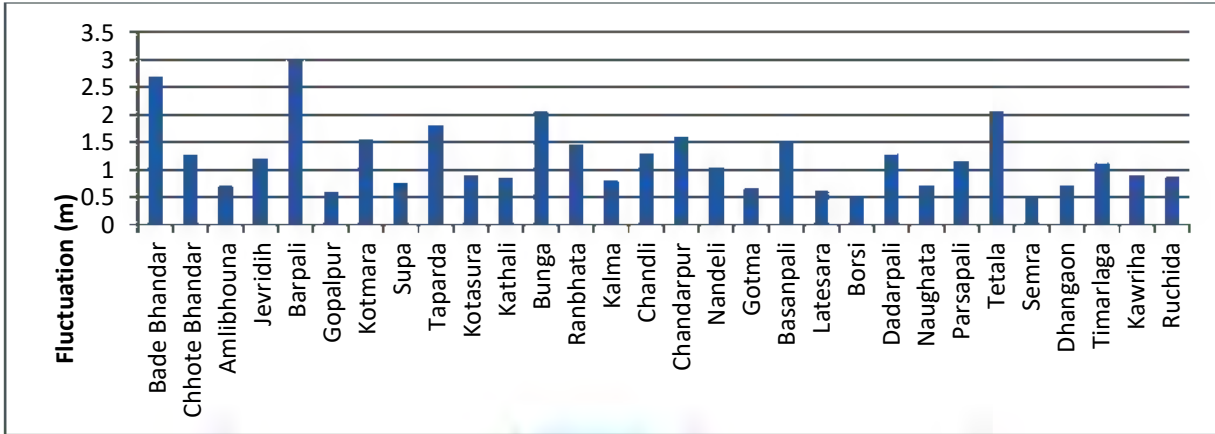


Fig. 16: Fluctuation (Raise/Fall) Analysis of the Study Area

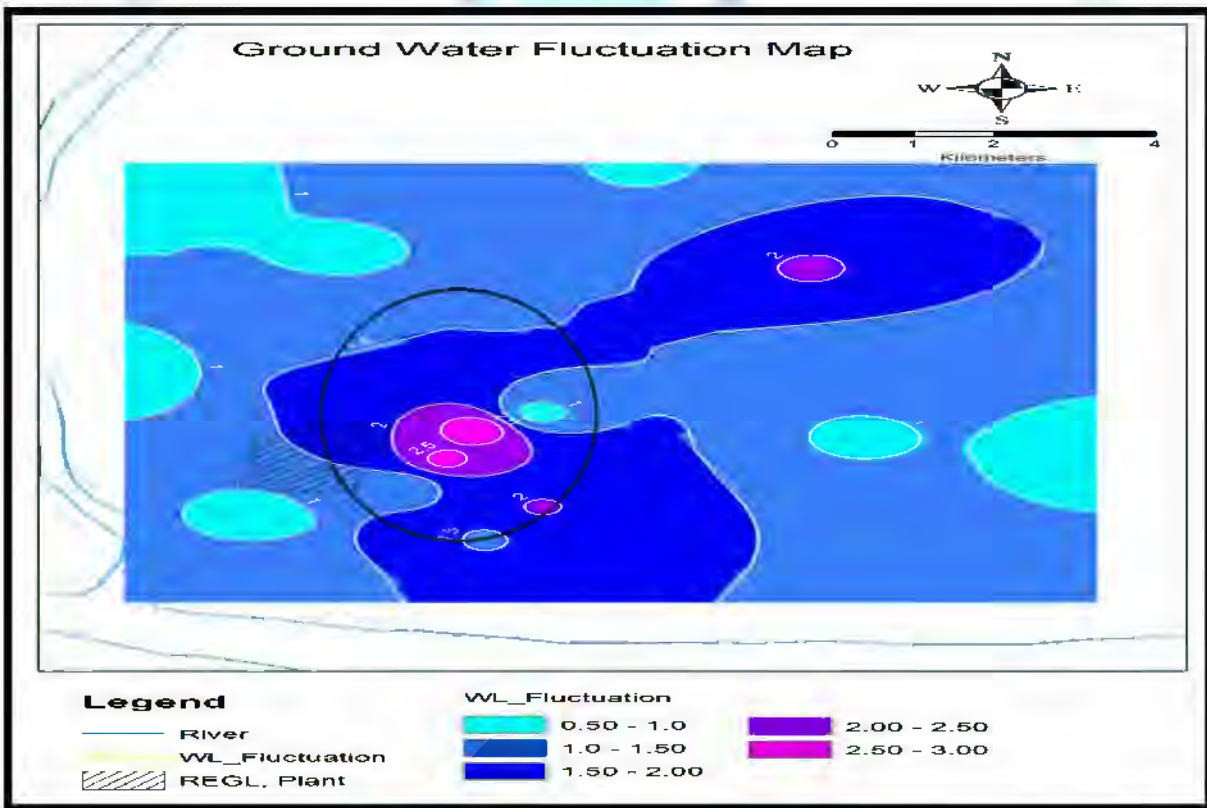


Fig. 17: Ground water Fluctuation Map



## 9. GEOPHYSICAL STUDY

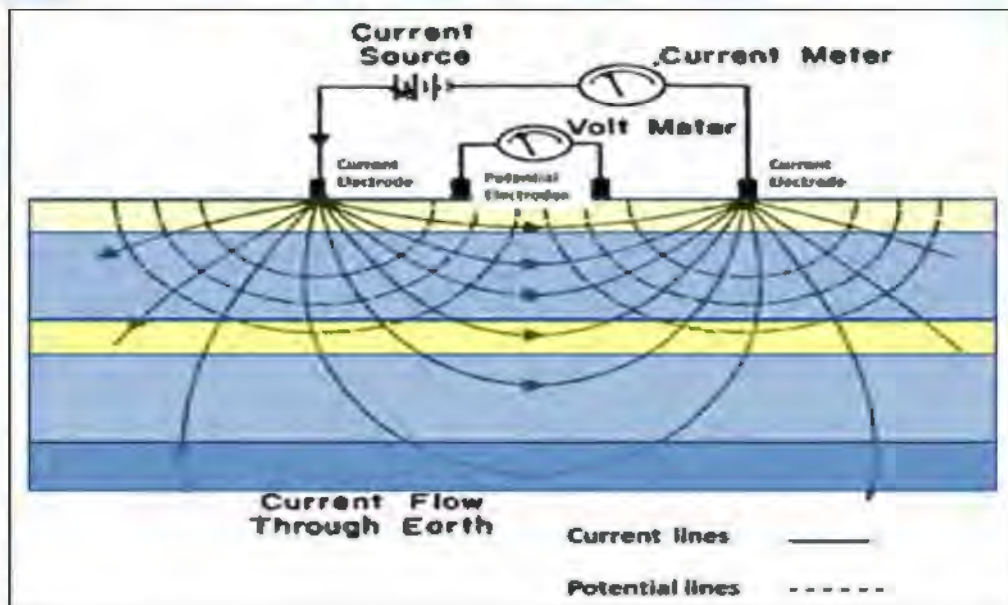
### 9.1 Introduction

To delineate the aquifer geometry Vertical Electrical Sounding (VES) by Schlumberger configuration are conducted in the plant area at village Bade Bhandar, Block Pussore, district Raigarh, Chhattisgarh. Location of VES is selected as per availability of open straight line workable space to cover the entire area. Depending upon the objectives the maximum current electrode spacing (AB) was kept 100 m. The spacing of the electrode controls the depth of investigation and the desired spacing facilitates to get the sub-surface information to the depths suitable for facilitating the rainwater harvesting. The observed resistance value from instrument was multiplied with geometric factor (K) to get the apparent resistivity values for each electrodes spacing. 'K' is the geometric factor and is calculated as per current and potential electrode spacing for each measurement. The field apparent resistivity data were plotted on log-log paper against the half current electrode separation to get the VES curves.

The method Vertical Electrical Sounding (VES) which reflects vertical distribution of electrical resistivity.

$$\rho = K \frac{\Delta V}{i}$$

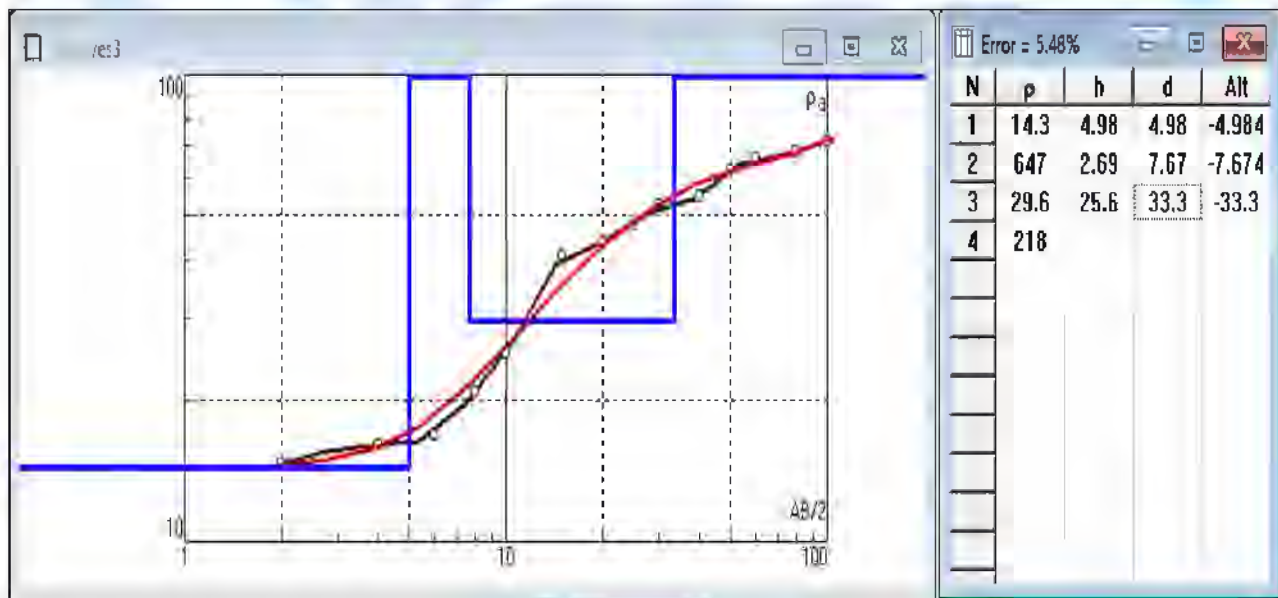
Schematic view of electrical resistivity method



VES-01

AB/2	MN/2	GEOLOGICAL FECTOR	RESISTANC E	APPRENT RESISTIVITY
2	0.5	11.79	1.08	12.7
4	0.5	49.5	0.28	13.9
6	0.5	112.36	0.13	14.6
8	0.5	200.36	0.09	18.0
10	2	313.5	0.07	21.9
15	2	706.36	0.05	35.3
20	2	1256.36	0.03	37.7
25	2	1963.5	0.021	41.2
30	2	2827.79	0.016	45.2
30	5	275	0.19	52.3
40	5	495	0.11	54.5
50	5	777.86	0.08	62.2
60	5	1123.57	0.059	66.3
80	5	2003.57	0.034	68.1
100	5	3135	0.023	72.1

Table No: 7

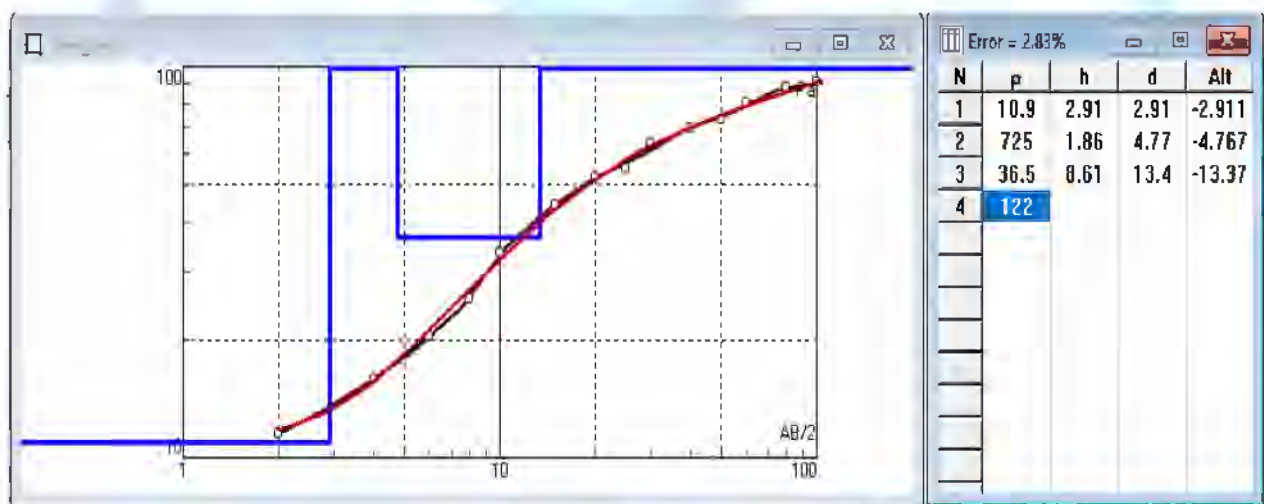


VES-02

AB/2	MN/2	GEOLOGICAL FECTOR	RESISTANC E	APPRENT RESISTIVITY
2	0.5	11.79	0.92	10.8

4	0.5	49.5	0.301	14.9
6	0.5	112.36	0.17	19.1
8	0.5	200.36	0.12	24.0
10	2	313.5	0.1	31.4
15	2	706.36	0.059	41.7
20	2	1256.36	0.039	49.0
25	2	1963.5	0.026	51.1
30	2	2827.79	0.021	59.4
30	5	275	0.23	63.3
40	5	495	0.14	69.3
50	5	777.86	0.094	73.1
60	5	1123.57	0.072	80.9
80	5	2003.57	0.044	88.2
100	5	3135	0.029	90.9

**Table No: 8**



After the close observation of VES curves and its interpretation it is very clear that the study area is having two to four layers earth model up-to depth of investigation. The thickness of topsoil is varying between 0.6 to 6.0 m with resistivity value 6 to 80 Ohm-m indicative of clayey to saturated sandy nature of soil. The lower value of resistivity indicates clayey nature of soil whereas the higher values indicate unsaturated shale nature of soil. The second layer at these locations is showing mixed nature of hydrogeological condition with depth range between 4.0 to 1.0 m and resistivity range between 6 Ohm-m to 160 Ohm-m. The lower value of resistivity (6 – 20 Ohm-m) indicates clay whereas the higher values (20 – 160 Ohm-m) indicate hard shale. The third layer at various locations is indicating again mixed nature of hydrogeology with depth range between 35.0 to 57.0 m and resistivity range between 10 Ohm-m to 2000 Ohm-m.

The resistivity value is varying due to lithological variation as limestone formation is intercalated with shale formation at limited locations. At majority of location this layer is encountered as last layer up to depth of investigation. The saturated zones occurring below water level contains potable formation water in this layer. The fourth and last layer at locations of VES1, VES4, VES5, VES8 and VES17 with resistivity values from 150 to 1800 Ohm-m is indicative of limestone formation. The lower value of resistivity (150 – 230 Ohm-m) indicates fractured limestone whereas the higher value (800 - 1800 Ohm-m) indicates hard and massive limestone. The potential aquifer in entire plant area is occurring within depth range from 20 to 57 m.

### **9.2 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.

### **9.3 Methodology:**

As mentioned in the scope of work covering the various Environmental components monitoring and sampling and its analysis was carried out based on the 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.

### **9.4 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 SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, 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.

### **9.5 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.

## 9.6 Chemical quality

The water samples for the period of last five years (2010-2014) were collected and analyzed for both core and buffer zones. Comparison has been made to have an overall chemical quality and changes over the years within the study area. The chemical quality of ground water was evaluated by collection of 10 nos. of water samples from selected villages (core and buffer zone). The photographs of hand pumps are indicated in **plate - II**, which was taken during sampling of ground water. The year wise summarized results of Chemical quality of groundwater in the study area are presented in **Table no 9**

Para-Meters	Prescribed limits as per IS 10500		Observed values(Pre-monsoon)					
	Desirable limit	Permissible limit	2010	2011	2012	2013	2014	2022
pH	6.5-8.5	No Relaxation	7.4-8.0	7.5-8.2	7.4-8.1	7.5-8.3	7.4-8.3	7.3-8.1
TDS(Mg/l)	500	2000	409-606	400-620	395-610	388-600	395-615	395-615
TH as CaCo <sub>3</sub> (Mg/l)	200	600	193-437	202-445	199-440	200-450	205-459	199-489
Alkalinity (Mg/l)	200	600	203-290	210-305	208-312	210-318	215-325	217-330
Ca(Mg/l)	75	200	33-114	35-100	37-109	40-111	42-115	40-121
Mg(Mg/l)	30	100	18-62	22-68	20-70	24-74	28-80	27-78
Cl (Mg/l)	250	1000	23-46	25-50	22-54	25-58	24-62	23-58
Fe(Mg/l)	0.3	No Relaxation	0.12-0.27	0.14-0.28	0.13-0.31	0.13-0.37	0.14-0.41	0.13-0.39
SO <sub>4</sub> (Mg/l)	200	400	16-176	46-159	42-165	45-170	46-177	46-177
F(Mg/l)	1	1.5	0.21-0.36	0.25-0.55	0.23-0.52	0.25-0.60	0.22-0.58	0.24-0.57
NO <sub>3</sub> (Mg/l)	45	No Relaxation	5.6-29	11-32	9-35	12-42	10-40	11-42

**Table 9: Year wise summarized results of chemical quality of ground water in the study area**

The analysis of the chemical data shows that, the quality of ground water in the area (both core and buffer zone) is generally alkaline in nature. All major ions are within the limits of Bureau of Indian Standards for drinking purposes and meet the quality requirements of irrigation. Thus ground water is suitable for irrigation, domestic as well as drinking purposes and there is no remarkable change in chemical quality.

## CONCLUSION

The study has been carried out to assess the impact of ground water abstraction on ground water storage and to identify the potential areas that have registered change in ground water levels and quality which in turn would help in identifying the appropriate measures for adoption of artificial recharge to neutralize the negative impact of the envisaged ground water development in and around the project area located at village- Chote Bhandar, Pussor block, District Raigarh, Chhattisgarh.

In the present report, the monitored data has been presented and the overall picture of ground water storage behavior due to continuous abstraction of ground water has been analyzed for the January 2010 to Nov 2014. The ground water monitoring study and results of analysis of water levels carried out in and around plant area within core and buffer zone shows that, ground water development in the area has been reflected in the depth to water levels of pre- and post-monsoon period and long-term trend of water levels.

Overall, from the comparison of mean water levels of the year 2010 to 2013 with respect to the years 2014 in pre-monsoon period all the villages in core zone which are considered for analysis showing decline trend in the range of -0.36 to -0.74 m while in the buffer zone also all the villages are showing declining trend in the range of -0.12 to -0.51 m. except Amaldiha, Kansara&Kauriha village which are showing rise in water level (0.04 - 0.08m)and in post-monsoon period, it is found that all the villages in core zone considered for analysis showing decline trend in the range of - 0.34 to - 0.43 m while in the buffer zone all the villages showing decline trend in the range of - 0.12 to - 0.54 m except Amaldiha, Kansara and Kauriha which are showing rising trend in the range of 0.01 to 0.09 m. The water level trend in both the periods showing marginal decline i.e. <1.00 m over the period of five years which may also be attributed to various industrial development activities going on in the area.

The analysis of the chemical data shows that, the quality of ground water in the area (both core and buffer zone) is generally alkaline in nature. All major ions are within the limits of Bureau of Indian Standards for drinking purposes and meet the quality requirements of irrigation. Thus, ground water is suitable for irrigation, domestic as well as drinking purposes and there is no remarkable change in chemical quality of ground water in and around the area.

Results of long-term monitoring of water levels in the area has indicated declining trend of water levels which warrants for taking up suitable measures for artificial recharge to ground water system. This increasing stress on ground water needs preventive action for water harvesting and recharge to ground water.

## **SUGGESTIVE MEASURES**

To maintain the ground water balance in the area, few measures are suggested below.

The ground water regime (both core and buffer zone) should be regularly monitored, and the distribution of the observation stations should be denser in the core zone especially. Purpose-built piezometers can be installed at suitable locations to have a closer observation of ground water level behavior in the core zone.

Suitable additional ground water recharge mechanism needs to be adopted in the core zone of the project area. Additional ponds may be considered for enhancing the ground water recharge. The selection and proper design of artificial recharge and water harvesting structures should be based on proper understanding of hydrology, hydrogeology of the project area. Geophysical survey is suggested for knowing the areas suitable for recharge, exact depth of recharge wells and aquifer geometry in the area.

The long-term water level monitoring in and around the area for the pre-monsoon & post-monsoon period over the years, reveals that the villages of core zone have registered marginal decline which may be accorded priority for taking up of recharge measures. Such initiatives would ease out the long-term negative impact of any ground water decline.

The chemical quality of ground water for core and buffer zone indifferent seasons should be monitored properly and regularly to watch change in chemical quality of ground water in and around the area over the period of observation.

-End-

Project Name- Raigarh Energy Generation Ltd.

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

3<sup>rd</sup> Quarter Environmental Monitoring Report

## 3<sup>rd</sup> 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)



Project Name- Raigarh Energy Generation Ltd.

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

3<sup>rd</sup> Quarter Environmental Monitoring Report

## PREFACE

The growing concern for environmental protection and the passing of various environmental legislations have increased the responsibilities of Ministry- of Environment, Forests & Climate Chang, 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 provision 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, Guru ram, (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 1<sup>st</sup> October 2022 to 31<sup>st</sup> December 2022, i.e. for 3<sup>rd</sup> 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:

04/01/2023



M/s Vardan EnviroLab Gurgaon (HR)



# 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/2210210001
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	27/10/2022
		Period of Analysis:	21/10/2022 to 27/10/2022
		Receipt Date:	21/10/2022
Sample Description:	Ambient Air Quality Monitoring		

### General Information:-

Sampling Location	: Village - Amalibhauna
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01/04
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'13"
Longitude (E)	: 83°16'30"
Meteorological Condition During Monitoring	: Intermittent Rain
Date of Sampling	: 18/10/2022 to 19/10/2022
Time of Sampling	: 10:30 AM to 10:30 AM
Ambient Temperature (°C)	: Min.22°C & Max. 30°C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	23.46	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	41.66	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6), Jacob & Hochheiser	16.69	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2), Modified West and Gaeke	6.86	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.82	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	—

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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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/AA/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/A/2210210002  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5703005102  
**Dated-** 28.06.2022  
**Report Date:** 27/10/2022  
**Period of Analysis:** 21/10/2022 to 27/10/2022  
**Receipt Date:** 21/10/2022

**Sample Description:** Ambient Air Quality Monitoring

### General Information:-

**Sampling Location** : Village - Kathli  
**Sample Collected By** : Vardan EnviroLab Representative  
**Sampling Equipment Used** : RDS & FPS  
**Instrument Code** : VEL/RDS/FPS/02/03  
**Instrument Calibration Status** : Calibrated  
**Latitude (N)** : 21°44'17"  
**Longitude (E)** : 83°16'19"  
**Meteorological Condition During Monitoring** : Intermittent Rain  
**Date of Sampling** : 18/10/2022 to 19/10/2022  
**Time of Sampling** : 10:45 AM to 10:45 AM  
**Ambient Temperature (°C)** : Min.22°C & Max. 30°C  
**Surrounding Activity** : Human, Vehicular & other Activities  
**Scope of Monitoring** : Regulatory Requirement  
**Sampling & Analysis Protocol** : CPCB Guidelines & IS-5182  
**Sampling Duration** : 24 Hrs.  
**Parameter Required** : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	27.29	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	51.27	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6), Jacob & Hochheiser	17.77	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2), Modified West and Gaeke	8.60	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.74	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.

\*\*\*End of Report\*\*\*

(Checked By)

(Approved By)  
27/10/2022



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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 Bandar, Tehsil- Pussore, Dist-  
Raigarh - 496100 (Chhattisgarh)

**Report No.:** VEL/A/2210210003  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5703005102  
**Dated-** 28.06.2022

**Report Date:** 27/10/2022  
**Period of Analysis:** 21/10/2022 to 27/10/2022  
**Receipt Date:** 21/10/2022

**Sample Description:** Ambient Air Quality Monitoring

### General Information:-

**Sampling Location** : Village - Chhote Bhandar  
**Sample Collected By** : Vardan EnviroLab Representative  
**Sampling Equipment Used** : RDS & FPS  
**Instrument Code** : VEL/RDS/FPS/03/01  
**Instrument Calibration Status** : Calibrated  
**Latitude (N)** : 21°44'22"  
**Longitude (E)** : 83°16'43"  
**Meteorological Condition During Monitoring** : Intermittent Rain  
**Date of Sampling** : 18/10/2022 to 19/10/2022  
**Time of Sampling** : 10:20 AM to 10:20 AM  
**Ambient Temperature (°C)** : Min.22°C & Max. 30°C  
**Surrounding Activity** : Human, Vehicular & Other Activities  
**Scope of Monitoring** : Regulatory Requirement  
**Sampling & Analysis Protocol** : CPCB Guidelines & IS-5182  
**Sampling Duration** : 24 Hrs.  
**Parameter Required** : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	32.48	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	56.85	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) ,Jacob & Hochheiser	17.59	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	7.13	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.64	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*





# 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/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/A/2210210004  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5703005102  
**Dated-** 28.06.2022

**Report Date:** 27/10/2022  
**Period of Analysis:** 21/10/2022 to 27/10/2022  
**Receipt Date:** 21/10/2022

**Sample Description:** Ambient Air Quality Monitoring

### General Information:-

**Sampling Location** : Village – Bade Bhandar  
**Sample Collected By** : Vardan EnviroLab Representative  
**Sampling Equipment Used** : RDS & FPS  
**Instrument Code** : VEL/RDS/FPS/04/07  
**Instrument Calibration Status** : Calibrated  
**Latitude (N)** : 21°44'29"  
**Longitude (E)** : 83°17'6"  
**Meteorological Condition During Monitoring** : Intermittent Rain  
**Date of Sampling** : 18/10/2022 to 19/10/2022  
**Time of Sampling** : 11:45 AM to 11:45 AM  
**Ambient Temperature (°C)** : Min.22°C & Max. 30°C  
**Surrounding Activity** : Human, Vehicular & other Activities  
**Scope of Monitoring** : Regulatory Requirement  
**Sampling & Analysis Protocol** : CPCB Guidelines & IS-5182  
**Sampling Duration** : 24 Hrs.  
**Parameter Required** : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	26.24	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	48.10	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) ,Jacob & Hochheiser	16.10	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	6.10	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.66	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.

\*\*\*End of Report\*\*\*



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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/AA/05	Report No.:	VEL/A/2210210005
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description :	Ambient Air Quality Monitoring	Report Date:	27/10/2022
		Period of Analysis:	21/10/2022 to 27/10/2022
		Receipt Date:	21/10/2022

### General Information:-

Sampling Location	: Near Site Office
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01/04
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'27"
Longitude	: 83°16'32"
Meteorological condition during monitoring	: Intermittent Rain
Date of Sampling	: 17/10/2022 to 18/10/2022
Time of Sampling	: 12:00 PM to 12:00 PM
Ambient Temperature (°C)	: Min.23°C, Max. 30 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	34.44	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	57.35	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) ,Jacob & Hochheiser	22.73	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	8.86	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.57	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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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

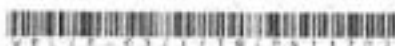
**Report No.:** VEL/A/2210210006  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5703005102  
**Dated-** 28.06.2022  
**Report Date:** 27/10/2022  
**Period of Analysis:** 21/10/2022 to 27/10/2022  
**Receipt Date:** 21/10/2022

### General Information:-

**Sampling Location** : Near Fire Office  
**Sample collected by** : Vardan EnviroLab Representative  
**Sampling Equipment used** : RDS & FPS  
**Instrument Code** : VEL/RDS/FPS/02/03  
**Instrument Calibration Status** : Calibrated  
**Latitude** : 21°44'27"  
**Longitude** : 83°16'32"  
**Meteorological condition during monitoring** : Intermittent Rain  
**Date of Sampling** : 17/10/2022 to 18/10/2022  
**Time of Sampling** : 12:20 PM to 12:20 PM  
**Ambient Temperature (°C)** : Min.23°C, Max. 30 °C  
**Surrounding Activity** : Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	30.18	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	59.46	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) ,Jacob & Hochheiser	22.15	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	8.26	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.65	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*





# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/AA/01	Report No.:	VEL/A/2211120001
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
Sample Description :	Ambient Air Quality Monitoring	Report Date:	16/11/2022
		Period of Analysis:	12/11/2022 to 16/11/2022
		Receipt Date:	12/11/2022

### General Information:-

Sampling Location	: Near Site Office
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01/04
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'27"
Longitude	: 83°16'32"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 08/11/2022 to 09/11/2022
Time of Sampling	: 12:15 PM to 12:15 PM
Ambient Temperature (°C)	: Min.18°C, Max. 32 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	38.11	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	67.45	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) ,Jacob & Hochheiser	25.47	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	8.03	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.68	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/REGL/AA/02  
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/2211120002  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Report Date: 16/11/2022  
Period of Analysis: 12/11/2022 to 16/11/2022  
Receipt Date: 12/11/2022

### General Information:-

Sampling Location : Near Fire Office  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/02/03  
Instrument Calibration Status : Calibrated  
Latitude : 21°44'27"  
Longitude : 83°16'32"  
Meteorological condition during monitoring : Clear Sky  
Date of Sampling : 08/11/2022 to 09/11/2022  
Time of Sampling : 12:20 PM to 12:20 PM  
Ambient Temperature (°C) : Min. 18°C, Max. 32 °C  
Surrounding Activity : Human, Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	28.94	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	57.27	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) Jacob & Hochheiser	25.87	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) Modified West and Gaeke	7.48	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.79	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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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 Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/A/2211120003  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Report Date: 16/11/2022  
Period of Analysis: 12/11/2022 to 16/11/2022  
Receipt Date: 12/11/2022

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location : Village - Bade Bhandar  
Sample Collected By : Vardan EnviroLab Representative  
Sampling Equipment Used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/04/07  
Instrument Calibration Status : Calibrated  
Latitude (N) : 21°44'29"  
Longitude (E) : 83°17'6"  
Meteorological Condition During Monitoring : Clear Sky  
Date of Sampling : 09/11/2022 to 10/11/2022  
Time of Sampling : 11:55 AM to 11:55 AM  
Ambient Temperature (°C) : Min.18°C & Max. 32°C  
Surrounding Activity : Human, Vehicular & other Activities  
Scope of Monitoring : Regulatory Requirement  
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182  
Sampling Duration : 24 Hrs.  
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	29.12	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	51.37	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) ,Jacob & Hochheiser	19.08	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	7.84	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.73	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.

\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## 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 Bandar, Tehsil- Pussore, Dist-  
Raigarh - 496100 (Chhattisgarh)

**Report No.:** VEL/A/2211160004  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5703005102  
Dated- 28.06.2022

**Report Date:** 16/11/2022  
**Period of Analysis:** 12/11/2022 to 16/11/2022  
**Receipt Date:** 12/11/2022

**Sample Description:** Ambient Air Quality Monitoring

### General Information:-

**Sampling Location** : Village - Chhote Bhandar  
**Sample Collected By** : Vardan EnviroLab Representative  
**Sampling Equipment Used** : RDS & FPS  
**Instrument Code** : VEL/RDS/FPS/03/01  
**Instrument Calibration Status** : Calibrated  
**Latitude (N)** : 21°44'22"  
**Longitude (E)** : 83°16'43"  
**Meteorological Condition During Monitoring** : Clear Sky  
**Date of Sampling** : 09/11/2022 to 10/11/2022  
**Time of Sampling** : 10:15 AM to 10:15 AM  
**Ambient Temperature (°C)** : Min.18°C & Max. 32°C  
**Surrounding Activity** : Human, Vehicular & Other Activities  
**Scope of Monitoring** : Regulatory Requirement  
**Sampling & Analysis Protocol** : CPCB Guidelines & IS-5182  
**Sampling Duration** : 24 Hrs.  
**Parameter Required** : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	30.71	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	53.49	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) ,Jacob & Hochheiser	19.50	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	8.64	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.71	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.

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# Vardan EnviroLab

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

## Test Report

**Sample Number:** VEL/REGL/AA/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/A/2211120005  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5703005102  
Dated- 28.06.2022

**Report Date:** 16/11/2022  
**Period of Analysis:** 12/11/2022 to 16/11/2022  
**Receipt Date:** 12/11/2022

**Sample Description:** Ambient Air Quality Monitoring

### General Information:-

**Sampling Location** : Village - Kathli  
**Sample Collected By** : Vardan EnviroLab Representative  
**Sampling Equipment Used** : RDS & FPS  
**Instrument Code** : VEL/RDS/FPS/02/03  
**Instrument Calibration Status** : Calibrated  
**Latitude (N)** : 21°44'17"  
**Longitude (E)** : 83°16'19"  
**Meteorological Condition During Monitoring** : Clear Sky  
**Date of Sampling** : 09/11/2022 to 10/11/2022  
**Time of Sampling** : 10:55 AM to 10:55 AM  
**Ambient Temperature (°C)** : Min.18°C & Max. 32°C  
**Surrounding Activity** : Human, Vehicular & other Activities  
**Scope of Monitoring** : Regulatory Requirement  
**Sampling & Analysis Protocol** : CPCB Guidelines & IS-5182  
**Sampling Duration** : 24 Hrs.  
**Parameter Required** : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	34.46	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	61.08	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) Jacob & Hochheiser	21.23	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) Modified West and Gaeke	7.89	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.70	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/AA/06	Report No.:	VEL/A/2211120006
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Report Date:	16/11/2022
		Period of Analysis:	12/11/2022 to 16/11/2022
		Receipt Date:	12/11/2022
Sample Description:	Ambient Air Quality Monitoring		

### General Information:-

Sampling Location	: Village - Amalibhauna
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01/04
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'13"
Longitude (E)	: 83°16'30"
Meteorological Condition During Monitoring	: Clear Sky
Date of Sampling	: 09/11/2022 to 10/11/2022
Time of Sampling	: 10:45 AM to 10:45 AM
Ambient Temperature (°C)	: Min.18°C & Max. 32°C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	31.06	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	55.72	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) ,Jacob & Hochheiser	19.24	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	5.92	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.76	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/AA/07	Report No.:	VEL/A/221120007
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Report Date:	16/11/2022
Sample Description :	Ambient Air Quality Monitoring	Period of Analysis:	12/11/2022 to 16/11/2022
		Receipt Date:	12/11/2022

### General Information:-

Sampling Location	: Supa Near REGL Plant
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01/04
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'27"
Longitude	: 83°16'32"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 08/11/2022 to 09/11/2022
Time of Sampling	: 12:15 PM to 12:15 PM
Ambient Temperature (°C)	: Min. 18°C, Max. 32 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	36.32	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	63.02	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) Jacob & Hochheiser	23.82	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	10.09	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.61	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.

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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/REGL/AA/08	<b>Report No.:</b>	VEL/A/2211120008
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102 Dated- 28.06.2022
		<b>Report Date:</b>	16/11/2022
		<b>Period of Analysis:</b>	12/11/2022 to 16/11/2022
		<b>Receipt Date:</b>	12/11/2022
<b>Sample Description:</b>	Ambient Air Quality Monitoring		

### General Information:-

Sampling Location	: Village - Konataral
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01/04
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'13"
Longitude (E)	: 83°16'30"
Meteorological Condition During Monitoring	: Clear Sky
Date of Sampling	: 09/11/2022 to 10/11/2022
Time of Sampling	: 10:45 AM to 10:45 AM
Ambient Temperature (°C)	: Min.18°C & Max. 32°C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24), Gravimetric Method	32.92	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23), Gravimetric Method	64.03	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6) ,Jacob & Hochheiser	23.11	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2) ,Modified West and Gaeke	5.02	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography/ VEL/ENV/STP/115, Issue No.-01	0.763	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/01	Report No.:	VEL/A/2212230006
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description :	Ambient Air Quality Monitoring	Report Date:	28/12/2022
		Period of Analysis:	23/12/2022 to 28/12/2022
		Receipt Date:	23/12/2022

### General Information:-

Sampling Location	: Near Site Office
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/02/06
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'26.85"
Longitude	: 83°16'31.94"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 19/12/2022 to 20/12/2022
Time of Sampling	: 12:30 PM to 12:30 PM
Ambient Temperature (°C)	: Min.12°C, Max. 30 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24)	40.06	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	73.80	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	24.15	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	9.82	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.78	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification, \*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/ A/02	Report No.:	VEL/A/2212230007
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
Sample Description :	Ambient Air Quality Monitoring	Report Date:	28/12/2022
		Period of Analysis:	23/12/2022 to 28/12/2022
		Receipt Date:	23/12/2022

### General Information:-

Sampling Location	: Near Fire Office
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/04/10
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'23.71"
Longitude	: 83°16'31"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 19/12/2022 to 20/12/2022
Time of Sampling	: 12:40 PM to 12:40 PM
Ambient Temperature (°C)	: Min.12°C, Max. 30 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24)	31.56	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	52.39	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	23.29	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	6.68	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.74	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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## Test Report

Sample Number:	VEL/ A/03	Report No.:	VEL/A/2212230008
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	28/12/2022
		Period of Analysis:	23/12/2022 to 28/12/2022
		Receipt Date:	23/12/2022

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location	: Village – Bade Bhandar
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01/04
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'28.76"
Longitude (E)	: 83°17'05.96"
Meteorological Condition During Monitoring	: Clear Sky
Date of Sampling	: 20/12/2022 to 21/12/2022
Time of Sampling	: 12:15 PM to 12:15 PM
Ambient Temperature (°C)	: Min.12°C & Max. 29°C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	39.57	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	60.25	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	18.66	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	6.59	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.77	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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## Test Report

Sample Number: VEL/ A/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/A/2212230009  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Report Date: 28/12/2022  
Period of Analysis: 23/12/2022 to 28/12/2022  
Receipt Date: 23/12/2022

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location : Village – Chhote Bhandar  
Sample Collected By : Vardan EnviroLab Representative  
Sampling Equipment Used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/02/06  
Instrument Calibration Status : Calibrated  
Latitude (N) : 21°44'21.63"  
Longitude (E) : 83°16'43.02"  
Meteorological Condition During Monitoring : Clear Sky  
Date of Sampling : 20/12/2022 to 21/12/2022  
Time of Sampling : 10:25 AM to 10:25 AM  
Ambient Temperature (°C) : Min.12°C & Max. 29°C  
Surrounding Activity : Human, Vehicular & Other Activities  
Scope of Monitoring : Regulatory Requirement  
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182  
Sampling Duration : 24 Hrs.  
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	29.11	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	58.65	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	22.44	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	7.92	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.69	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	–

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification, \*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/ A/05	Report No.:	VEL/A/2212230010
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-03
		Party Reference No.:	5703005102
			Dated- 28.06.2022
		Report Date:	28/12/2022
		Period of Analysis:	23/12/2022 to 28/12/2022
		Receipt Date:	23/12/2022

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location	: Village - Kathli
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/04/10
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'16.55"
Longitude (E)	: 83°16'27.45"
Meteorological Condition During Monitoring	: Clear Sky
Date of Sampling	: 20/12/2022 to 21/12/2022
Time of Sampling	: 11:10 AM to 11:10 AM
Ambient Temperature (°C)	: Min.12°C & Max. 29°C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	37.85	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	64.01	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	25.14	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	7.08	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.65	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification, \*\*\*End of Report\*\*\*



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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/01  
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.  
Village - Chhote Bhandar,  
Post Office- Bade Bandar, Tehsil- Passore,  
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2210210001  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 27/10/2022  
Receipt Date: 21/10/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village- Amalibhauna  
Instrument Used : Sound Level Meter-01  
Instrument Code : VEL/SLM/08  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Intermittent Rain  
Date of Monitoring : 18/10/2022 to 19/10/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.22°C & Max. 30°C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{A_{ten}}$	IS 9989, By Calculation	57.6	49.6
2.	$L_{A_{90}}$	IS 9989, By Calculation	39.1	42.8
3.	$L_{eq}$	IS 9989, By Calculation	53.44	44.39

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

- Day Time is from 6.00 AM to 10.00 PM.
  - Night Time is reckoned between 10.00 PM to 6.00 AM.
  - 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  
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.  
Village - Chhote Bhandar,  
Post Office- Bade Bandar, Tehsil- Passore,  
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2210210002  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 27/10/2022  
Receipt Date: 21/10/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village-Kathli  
Instrument Used : Sound Level Meter-02  
Instrument Code : VEL/SLM/09  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Intermittent Rain  
Date of Monitoring : 18/10/2022 to 19/10/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.22°C & Max. 30 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L <sub>Max</sub>	IS 9989, By Calculation	61.6	49.8
2.	L <sub>Min</sub>	IS 9989, By Calculation	40.7	36.8
3.	L <sub>eq</sub>	IS 9989, By Calculation	55.79	44.26

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/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/N/2210210004  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 27/10/2022  
Receipt Date: 21/10/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village- Bade Bhandar  
Instrument Used : Sound Level Meter-04  
Instrument Code : VEL/SLM/06  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Intermittent Rain  
Date of Monitoring : 18/10/2022 to 19/10/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.22°C & Max. 30 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L <sub>Max</sub>	IS 9989, By Calculation	59.6	50.7
2.	L <sub>Min</sub>	IS 9989, By Calculation	46.8	38.4
3.	L <sub>eq</sub>	IS 9989, By Calculation	53.05	43.74

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.  
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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/REG/AN/06  
**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/N/2210210006  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5703005102  
**Dated-** 28.06.2022  
**Reporting Date:** 27/10/2022  
**Receipt Date:** 21/10/2022

**Sample Description:** Ambient Noise Level Monitoring

### General Information:-

**Sample Collected By** : Vardan EnviroLab Representative  
**Sampling Location** : Admin Office  
**Instrument Used** : Sound Level Meter-02  
**Instrument Code** : VEL/SLM/04  
**Instrument Calibration Status** : Calibrated  
**Meteorological Condition During Monitoring** : Intermittent Rain  
**Date of Monitoring** : 17/10/2022 to 18/10/2022  
**Time of Monitoring** : 06:00 AM to 06:00AM  
**Ambient Temperature (°C)** : Min.23°C & Max. 30 °C  
**Surrounding Activity** : Human, Vehicular and other Activities  
**Sampling Duration** : 24 Hrs.  
**Scope of Monitoring** : Regulatory Requirement  
**Protocol Used** : IS 9989 & CPCB Guidelines  
**Parameter Required** : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989, By Calculation	59.4	56.4
2	L <sub>Min</sub>	IS 9989, By Calculation	40.7	39.6
3	L <sub>eq</sub>	IS 9989, By Calculation	53.20	42.20

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, 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/07	Report No.:	VEL/N/2210210007
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Passore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/10/2022
		Receipt Date:	21/10/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Near Fire Office
Instrument Used	: Sound Level Meter-03
Instrument Code	: VEL/SLM/02
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Intermittent Rain
Date of Monitoring	: 17/10/2022 to 18/10/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.23°C & Max. 30 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989, By Calculation	61.7	50.7
2	L <sub>Min</sub>	IS 9989, By Calculation	42.5	36.8
3	L <sub>eq</sub>	IS 9989, By Calculation	49.85	43.26

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, 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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## Test Report

Sample Number:	VEL/REGL/AN/08	Report No.:	VEL/N/2210210008
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/10/2022
		Receipt Date:	21/10/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Near DM Plant
Instrument Used	: Sound Level Meter-04
Instrument Code	: VEL/SLM/03
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Intermittent Rain
Date of Monitoring	: 17/10/2022 to 18/10/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.23°C & Max. 30 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	$L_{Min}$	IS 9989, By Calculation	69.9	58.7
2	$L_{Max}$	IS 9989, By Calculation	47.4	37.8
3	$L_{eq}$	IS 9989, By Calculation	60.26	47.07

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

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

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

15. 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





# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/REGL/AN/01  
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/N/2211120001  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 16/11/2022  
Receipt Date: 12/11/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Near Site Office  
Instrument Used : Sound Level Meter-01  
Instrument Code : VEL/SLM/07  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 08/11/2022 to 09/11/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.18°C & Max. 32 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	$L_{Max}$	IS 9989, By Calculation	63.2	54.1
2	$L_{Min}$	IS 9989, By Calculation	44.5	39.3
3	$L_{eq}$	IS 9989, By Calculation	54.72	45.62

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, 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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

<b>Sample Number:</b>	VEL/REGI/AN/02	<b>Report No.:</b>	VEL/N/221120002
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Reporting Date:</b>	Dated- 28.06.2022 16/11/2022
		<b>Receipt Date:</b>	12/11/2022

**Sample Description:** Ambient Noise Level Monitoring

### General Information:-

<b>Sample Collected By</b>	:	Vardan EnviroLab Representative
<b>Sampling Location</b>	:	Near DM Plant
<b>Instrument Used</b>	:	Sound Level Meter-04
<b>Instrument Code</b>	:	VEL/SLM/03
<b>Instrument Calibration Status</b>	:	Calibrated
<b>Meteorological Condition During Monitoring</b>	:	Clear Sky
<b>Date of Monitoring</b>	:	08/11/2022 to 09/11/2022
<b>Time of Monitoring</b>	:	06:15 AM to 06:15AM
<b>Ambient Temperature (°C)</b>	:	Min. 18°C & Max. 32 °C
<b>Surrounding Activity</b>	:	Human, Vehicular and other Activities
<b>Sampling Duration</b>	:	24 Hrs.
<b>Scope of Monitoring</b>	:	Regulatory Requirement
<b>Protocol Used</b>	:	IS 9989 & CPCB Guidelines
<b>Parameter Required</b>	:	As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989, By Calculation	67.7	56.5
2	L <sub>Min</sub>	IS 9989, By Calculation	45.9	36.7
3	L <sub>eq</sub>	IS 9989, By Calculation	58.41	46.18

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

13. Day Time is from 6.00 AM to 10.00 PM.  
14. Night Time is reckoned between 10.00 PM to 6.00 AM.  
15. 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 category 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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number: VEL/REGL/AN/03  
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/N/2211120003  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 16/11/2022  
Receipt Date: 12/11/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Near Fire Office  
Instrument Used : Sound Level Meter-03  
Instrument Code : VEL/SLM/02  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 08/11/2022 to 09/11/2022  
Time of Monitoring : 06:00 AM to 05:00AM  
Ambient Temperature (°C) : Min.18°C & Max. 32 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989, By Calculation	63.9	52.5
2	L <sub>Min</sub>	IS 9989, By Calculation	43.3	38.1
3	L <sub>eq</sub>	IS 9989, By Calculation	51.48	44.06

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, Loudspeaker and bursting of crackers is banned in these zones.  
Note: Mixed category 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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Amrisha Kumar  
Signature

Dr Shiv Prakash  
Signature





# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/REGL/AN/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/N/221120005  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 16/11/2022  
Receipt Date: 12/11/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village- Bade Bhandar  
Instrument Used : Sound Level Meter-04  
Instrument Code : VEL/SLM/06  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 09/11/2022 to 10/11/2022  
Time of Monitoring : 06:00 AM to 06:00 AM  
Ambient Temperature (°C) : Min. 18°C & Max. 32 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{\text{stat}}$	IS 9989, By Calculation	57.2	51.4
2.	$L_{\text{stat}}$	IS 9989, By Calculation	49.6	39.9
3.	$L_{\text{eq}}$	IS 9989, By Calculation	54.75	45.15

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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number: VEL/REGL/AN/06  
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/N/2211120006  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 16/11/2022  
Receipt Date: 12/11/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village-Chhote Bhandar  
Instrument Used : Sound Level Meter-03  
Instrument Code : VEL/SLM/05  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 09/11/2022 to 10/11/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.18°C & Max. 32 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L <sub>Max</sub>	IS 9989, By Calculation	55.3	47.2
2.	L <sub>Min</sub>	IS 9989, By Calculation	48.3	35.6
3.	L <sub>eq</sub>	IS 9989, By Calculation	52.38	42.18

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

### Terms & Conditions

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Amitabh Kumar  
Analyst

Dr. Shiv Prakash Singh  
Approved By  
16/11/2022







# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/REGL/AN/07  
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/N/2211120007  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 16/11/2022  
Receipt Date: 10/11/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village-Kathli  
Instrument Used : Sound Level Meter-02  
Instrument Code : VEL/SLM/12  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 09/11/2022 to 10/11/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min. 18°C & Max. 32 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L <sub>Max</sub>	IS 9989, By Calculation	58.6	48.6
2.	L <sub>Min</sub>	IS 9989, By Calculation	39.3	37.4
3.	L <sub>eq</sub>	IS 9989, By Calculation	53.84	42.19

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.  
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# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/REGI/AN/08  
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/N/2211120008  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 16/11/2022  
Receipt Date: 12/11/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village- Amalibhauna  
Instrument Used : Sound Level Meter-01  
Instrument Code : VEL/SLM/04  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 09/11/2022 to 10/11/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.18°C & Max. 32°C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Min}$	IS 9989, By Calculation	58.2	49.2
2.	$L_{Max}$	IS 9989, By Calculation	40.3	39.1
3.	$L_{eq}$	IS 9989, By Calculation	53.35	44.78

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: Any of 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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number:	VEL/N/01	Report No.:	VEL/N/2212230021
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	28/12/2022
		Receipt Date:	23/12/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Near Site Office
Instrument Used	: Sound Level Meter-01
Instrument Code	: VEL/SLM/07
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Clear Sky
Date of Monitoring	: 19/12/2022 to 20/12/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.12°C & Max. 30 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Min</sub>	IS 9989, By Calculation	58.6	50.9
2	L <sub>Min</sub>	IS 9989, By Calculation	42.2	38.6
3	L <sub>eq</sub>	IS 9989, By Calculation	52.92	43.59

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, 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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number:	VEL/N/02	Report No.:	VEL/N/2212230022
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	28/12/2022
		Receipt Date:	23/12/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Near DM Plant
Instrument Used	: Sound Level Meter-04
Instrument Code	: VEL/SLM/03
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Clear Sky
Date of Monitoring	: 19/12/2022 to 20/12/2022
Time of Monitoring	: 06:15 AM to 06:15 AM
Ambient Temperature (°C)	: Min.12°C & Max. 30 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989, By Calculation	69.1	58.4
2	L <sub>Min</sub>	IS 9989, By Calculation	47.5	38.2
3	L <sub>eq</sub>	IS 9989, By Calculation	56.24	47.92

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

- Day Time is from 6.00 AM to 10.00 PM.
- Night Time is reckoned between 10.00 PM to 6.00 AM.
- 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

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APPROVED  
23/12/2022



## Test Report

<b>Sample Number:</b>	VEL/N/03	<b>Report No.:</b>	VEL/N/2212230023
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
		<b>Reporting Date:</b>	28/12/2022
		<b>Receipt Date:</b>	23/12/2022

**Sample Description:** Ambient Noise Level Monitoring

### General Information:-

<b>Sample Collected By</b>	: Vardan EnviroLab Representative
<b>Sampling Location</b>	: Village- Bade Bhandar
<b>Instrument Used</b>	: Sound Level Meter-04
<b>Instrument Code</b>	: VEL/SLM/06
<b>Instrument Calibration Status</b>	: Calibrated
<b>Meteorological Condition During Monitoring</b>	: Clear Sky
<b>Date of Monitoring</b>	: 20/12/2022 to 21/12/2022
<b>Time of Monitoring</b>	: 06:00 AM to 06:00 AM
<b>Ambient Temperature (°C)</b>	: Min.12°C & Max. 29°C
<b>Surrounding Activity</b>	: Human, Vehicular and other Activities
<b>Sampling Duration</b>	: 24 Hrs.
<b>Scope of Monitoring</b>	: Regulatory Requirement
<b>Protocol Used</b>	: IS 9989 & CPCB Guidelines
<b>Parameter Required</b>	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{stat}$	IS 9989, By Calculation	56.4	47.8
2.	$L_{min}$	IS 9989, By Calculation	45.6	37.5
3.	$L_{eq}$	IS 9989, By Calculation	51.48	44.26

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

- Day Time is from 6.00 AM to 10.00 PM.
- Night Time is reckoned between 10.00 PM to 6.00 AM.
- 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: Method 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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number: VEL/N/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/N/2212230024  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 28/12/2022  
Receipt Date: 23/12/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village-Chhote Bhandar  
Instrument Used : Sound Level Meter-03  
Instrument Code : VEL/SLM/05  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 20/12/2022 to 21/12/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.12°C & Max. 29°C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L <sub>Max</sub>	IS 9989, By Calculation	59.7	53.6
2.	L <sub>Std</sub>	IS 9989, By Calculation	46.6	38.2
3.	L <sub>eq</sub>	IS 9989, By Calculation	51.79	43.59

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.  
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Approved By: [Signature]  
28/12/2022





## Test Report

Sample Number: VEL/N/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/N/212230025  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 28/12/2022  
Receipt Date: 23/12/2022

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village-Kathli  
Instrument Used : Sound Level Meter-02  
Instrument Code : VEL/SLM/12  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 20/12/2022 to 21/12/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.12°C & Max. 29°C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L <sub>Max</sub>	IS 9989, By Calculation	62.5	52.3
2.	L <sub>Min</sub>	IS 9989, By Calculation	43.8	38.6
3.	L <sub>eq</sub>	IS 9989, By Calculation	52.50	43.74

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

- Day Time is from 6.00 AM to 10.00 PM.
- Night Time is reckoned between 10.00 PM to 6.00 AM.
- 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.

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## Test Report

<b>Sample Number:</b>	VEL/N/06	<b>Report No.:</b>	VEL/N/2212230026
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village – Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
		<b>Reporting Date:</b>	28/12/2022
		<b>Receipt Date:</b>	23/12/2022

**Sample Description:** Ambient Noise Level Monitoring

### General Information:-

<b>Sample Collected By</b>	: Vardan EnviroLab Representative
<b>Sampling Location</b>	: Village- Amalibhauna
<b>Instrument Used</b>	: Sound Level Meter-01
<b>Instrument Code</b>	: VEL/SLM/04
<b>Instrument Calibration Status</b>	: Calibrated
<b>Meteorological Condition During Monitoring</b>	: Clear Sky
<b>Date of Monitoring</b>	: 20/12/2022 to 21/12/2022
<b>Time of Monitoring</b>	: 06:00 AM to 06:00AM
<b>Ambient Temperature (°C)</b>	: Min.12°C & Max. 29°C
<b>Surrounding Activity</b>	: Human, Vehicular and other Activities
<b>Sampling Duration</b>	: 24 Hrs.
<b>Scope of Monitoring</b>	: Regulatory Requirement
<b>Protocol Used</b>	: IS 9989 & CPCB Guidelines
<b>Parameter Required</b>	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{MAX}$	IS 9989, By Calculation	59.8	51.1
2.	$L_{MIN}$	IS 9989, By Calculation	42.1	36.6
3.	$L_{EQ}$	IS 9989, By Calculation	51.89	41.40

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

- Day Time is from 6.00 AM to 10.00 PM.
- Night Time is reckoned between 10.00 PM to 6.00 AM.
- 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.

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APPROVED  
28/12/2022  
K. APPROVED









## Test Report

Sample No.: VEL/REGL/W/06			Report No.: VEL/GW/220929001			
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)	IS 3025 (P-60)	0.23	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.84	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01	0.29	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01	0.17	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml	--	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.





# 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/02	Report No.:	VEL/GW/2210210002
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/10/2022
		Period of Analysis:	21/10/2022 to 27/10/2022
Sample Description:	Ground Water	Receipt Date:	21/10/2022
Sampling Location:	Near Ash Pond	Sampling Date:	17/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Type:	Grab
Preservation:	Refrigerated	Sample Quantity:	2.5 Ltr.+250 ml
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

### 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)	7.26	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	237.20	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	53.16	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	217.10	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P- 32 )	65.40	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	IS 3025 (P-46)	25.40	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	335.29	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	29.83	mg/L	200	400



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## Test Report

Sample No.: VEL/REGL/W/02			Report No.: VEL/GW/2210210002			
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)	IS 3025 (P-60)	0.34	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P -34)	2.90	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01	0.19	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P- 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01	0.12	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS:3025 (P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal Coliform	IS 1622	<2	MPN/100ml	--	

Note: \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.





# 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/03	Report No.:	VEL/GW/2210210003
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	27/10/2022
Sampling Location:	Village- Bade Bhandar	Period of Analysis:	21/10/2022 to 27/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	21/10/2022
Preservation:	Refrigerated	Sampling Date:	18/10/2022
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 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)	IS 3025 (P-11)	7.40	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	276.8	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	67.24	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	174.66	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P- 32)	52.06	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	IS 3025 (P-46)	26.50	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	396.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	24.55	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/GW/2210210003		
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)	IS 3025 (P-60)	0.29	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.14	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01	0.26	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P- 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01	0.22	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025 (P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal Coliform	IS 1622	<2	MPN/100ml	--	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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## Test Report

Sample Number:	VEL/REGL/W/04	Report No.:	VEL/GW/2210210004
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated:	28.06.2022
		Reporting Date:	27/10/2022
		Period of Analysis:	21/10/2022 to 27/10/2022
		Receipt Date:	21/10/2022
Sample Description:	Ground Water	Sampling Date:	18/10/2022
Sampling Location:	Village- Chhote Bhandar	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr.+250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.37	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	239.65	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	56.29	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	226.55	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	62.36	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	IS 3025 (P-46)	24.11	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	392.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	26.79	mg/L	200	400





## Test Report

Sample No.: VEL/REGL/W/04			Report No.: VEL/GW/2210210004			
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)	IS 3025 (P-60)	0.45	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.36	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01	0.20	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No.-01	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01	0.26	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025 (P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal Coliform	IS 1622	<2	MPN/100ml	--	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.







# 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/05	Report No.:	VEL/GW/2210210005
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Reporting Date:	Dated- 28.06.2022 27/10/2022
Sample Description:	Ground Water	Period of Analysis:	21/10/2022 to 27/10/2022
Sampling Location:	Village- Amalibhauna	Receipt Date:	21/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	18/10/2022
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sample Quantity:	2.5 Ltr + 250 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)	IS 3025 (P-11)	7.16	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	187.39	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	48.29	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	168.25	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	52.21	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	IS 3025 (P-46)	16.26	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	333.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	16.14	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/05			Report No.: VEL/GW/2210210005			
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)	IS 3025 (P-60)	0.29	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.78	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01	0.26	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01	0.16	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025 (P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml	--	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/REGL/W/01	<b>Report No.:</b>	VEL/GW/2211120001
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
<b>Sample Description:</b>	Ground Water	<b>Reporting Date:</b>	16/11/2022
<b>Sampling Location:</b>	Industrial Canteen	<b>Period of Analysis:</b>	12/11/2022 to 16/11/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Receipt Date:</b>	12/11/2022
<b>Preservation:</b>	Refrigerated	<b>Sampling Date:</b>	08/11/2022
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	<b>Sampling Type:</b>	Grab
		<b>Sample Quantity:</b>	2.5 Ltr + 250 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)	IS 3025 (P-11)	7.42	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	195.12	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	51.87	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	179.65	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	56.74	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	15.97	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	319.02	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	21.32	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/REGL/W/01				Report No.: VEL/GW/2211120001		
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 4500 FD	0.26	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.73	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.32	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.14	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/REGL/W/02	<b>Report No.:</b>	VEL/GW/2211120002
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
<b>Sample Description:</b>	Ground Water	<b>Reporting Date:</b>	16/11/2022
<b>Sampling Location:</b>	Near Ash Pond	<b>Period of Analysis:</b>	12/11/2022 to 16/11/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Receipt Date:</b>	12/11/2022
<b>Preservation:</b>	Refrigerated	<b>Sampling Date:</b>	08/11/2022
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	<b>Sampling Type:</b>	Grab
		<b>Sample Quantity:</b>	2.5 Ltr.+250 ml

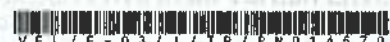
## TEST RESULTS

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)	IS 3025 (P-11)	7.52	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	241.11	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	56.43	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	212.94	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	61.63	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	24.38	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	331.85	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	27.24	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/REGL/W/02				Report No.: VEL/GW/2211120002		
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 4500 FD	0.29	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.76	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.22	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.15	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml	-	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/REGL/W/03	<b>Report No.:</b>	VEL/GW/2212110003
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
<b>Sample Description:</b>	Ground Water	<b>Reporting Date:</b>	16/11/2022
<b>Sampling Location:</b>	Guast House Canteen	<b>Period of Analysis:</b>	12/11/2022 to 16/11/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Receipt Date:</b>	12/11/2022
<b>Preservation:</b>	Refrigerated	<b>Sampling Date:</b>	09/11/2022
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	<b>Sampling Type:</b>	Grab
		<b>Sample Quantity:</b>	2.5 Ltr.+250 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)	IS 3025 (P-11)	7.235	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	231.08	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	57.03	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	170.00	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	53.92	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	21.58	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	331.54	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	29.12	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/REGL/W/03				Report No.: VEL/GW/2211120003		
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 4500 FD	0.33	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.22	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.44	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.22	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml	--	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/REGL/W/04	<b>Report No.:</b>	VEL/GW/2211120004
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village—Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
		<b>Reporting Date:</b>	16/11/2022
		<b>Period of Analysis:</b>	12/11/2022 to 16/11/2022
<b>Sample Description:</b>	Ground Water	<b>Receipt Date:</b>	12/11/2022
<b>Sampling Location:</b>	Near Fire Building	<b>Sampling Date:</b>	09/11/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Sampling Type:</b>	Grab
<b>Preservation:</b>	Refrigerated	<b>Sample Quantity:</b>	2.5 Ltr.+250 ml
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.56	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	243.28	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	51.33	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	222.38	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	59.92	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	27.99	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	389.08	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	29.12	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/REGL/W/04				Report No.: VEL/GW/2211120004		
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 4500 FD	0.39	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.93	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.18	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.26	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	--
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		--

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/REGL/W/05	<b>Report No.:</b>	VEL/GW/2211120005
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh-496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
		<b>Reporting Date:</b>	16/11/2022
		<b>Period of Analysis:</b>	12/11/2022 to 16/11/2022
<b>Sample Description:</b>	Ground Water	<b>Receipt Date:</b>	12/11/2022
<b>Sampling Location:</b>	Piezometer Point No.2(Near Ash Pond)	<b>Sampling Date:</b>	08/11/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Sampling Type:</b>	Grab
<b>Preservation:</b>	Refrigerated	<b>Sample Quantity:</b>	2.5 Ltr + 250 ml
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

### 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)	7.61	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	235.24	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	54.76	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	169.76	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	59.01	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	23.96	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	311.78	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	19.02	mg/L	200	400



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## Test Report

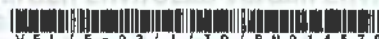
Sample No.: VEL/REGL/W/05		Report No.: VEL/GW/221120005				
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 FD	0.30	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.11	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.38	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.18	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL /GW/01	Report No.:	VEL/W/2212230027
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	28/12/2022
Sampling Location:	Industrial Canteen	Period of Analysis:	23/12/2022 to 28/12/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	23/12/2022
Preservation:	Refrigerated	Sampling Date:	19/12/2022
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr + 250 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)	IS 3025 (P-11)	7.38	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	191.55	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	54.04	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	166.48	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	52.29	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	13.78	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	324.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	18.84	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/01			Report No.: VEL/W/2212230027			
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 4500 FD	0.32	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.54	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.36	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.17	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	--
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml	--	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



Satyadev  
28/11/2022  
**SATYADEV**  
Dy. Technical Manager-Micr



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/GW/02	<b>Report No.:</b>	VEL/W/2212230028
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bada Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Reporting Date:</b>	Dated- 28.06.2022 28/12/2022
<b>Sample Description:</b>	Ground Water	<b>Period of Analysis:</b>	23/12/2022 to 28/12/2022
<b>Sampling Location:</b>	Near Ash Pond	<b>Receipt Date:</b>	23/12/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Sampling Date:</b>	19/12/2022
<b>Preservation:</b>	Refrigerated	<b>Sampling Type:</b>	Grab
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	<b>Sample Quantity:</b>	2.5 Ltr.+250 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)	IS 3025 (P-11)	7.66	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	247.57	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	59.41	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	205.48	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	57.33	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	24.14	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	328.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	26.72	mg/L	200	400



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## Test Report

Sample No.: VEL/GW/02			Report No.: VEL/W/2211120028			
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 4500 FD	0.33	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.14	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.19	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.11	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



SATYA DEV  
Dy. Technical Manager-Micrc



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL /GW/03	<b>Report No.:</b>	VEL/W/2212230029
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Reporting Date:</b>	28/12/2022
		<b>Period of Analysis:</b>	23/12/2022 to 28/12/2022
<b>Sample Description:</b>	Ground Water	<b>Receipt Date:</b>	23/12/2022
<b>Sampling Location:</b>	Near Guest House Canteen	<b>Sampling Date:</b>	19/12/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Sampling Type:</b>	Grab
<b>Preservation:</b>	Refrigerated	<b>Sample Quantity:</b>	2.5 Ltr.+250 ml
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.15	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	225.64	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	53.23	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	165.00	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	48.83	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	22.56	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	337.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	27.11	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/03				Report No.: VEL/W/2212230029		
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 4500 FD	0.38	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.16	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.49	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.33	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



*Satya Dev*  
**SATYA DEV**  
Dy. Technical Manager-Micrc



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/GW/04	<b>Report No.:</b>	VEL/W/2212230030
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village-Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Reporting Date:</b>	Dated- 28.06.2022
		<b>Period of Analysis:</b>	28/12/2022
<b>Sample Description:</b>	Ground Water	<b>Receipt Date:</b>	23/12/2022 to 28/12/2022
<b>Sampling Location:</b>	Village- Bade Bhandar	<b>Sampling Date:</b>	23/12/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Sampling Type:</b>	Grab
<b>Preservation:</b>	Refrigerated	<b>Sample Quantity:</b>	2.5 Ltr.+250 ml
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.86	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	278.49	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	74.21	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	187.13	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	64.58	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	22.69	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	421.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	15.29	mg/L	200	400



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# Vardan EnviroLab

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

ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample No.: VEL/GW/04				Report No.: VEL/W/2212230030		
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 4500 FD	0.31	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.12	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.23	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.11	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL /GW/05	<b>Report No.:</b>	VEL/W/2212230031
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Reporting Date:</b>	Dated- 28.06.2022
		<b>Period of Analysis:</b>	28/12/2022
		<b>Receipt Date:</b>	23/12/2022 to 28/12/2022
<b>Sample Description:</b>	Ground Water	<b>Sampling Date:</b>	23/12/2022
<b>Sampling Location:</b>	Village- Chhote Bhandar	<b>Sampling Type:</b>	Grab
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Sample Quantity:</b>	2.5 Ltr.+250 ml
<b>Preservation:</b>	Refrigerated		
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.48	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	241.56	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	59.07	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	225.14	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	62.47	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	22.88	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	377.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	23.62	mg/L	200	400



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## Test Report

Sample No.: VEL/GW/05				Report No.: VEL/W/2212230031		
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 4500 FD	0.33	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	4.57	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.18	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ-0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/06	Report No.:	VEL/W/2212230032
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Reporting Date:	Dated- 28.06.2022
		Period of Analysis:	28/12/2022
Sample Description:	Ground Water	Receipt Date:	23/12/2022 to 28/12/2022
Sampling Location:	Village- Kathli	Sampling Date:	23/12/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Type:	Grab
Preservation:	Refrigerated	Sample Quantity:	2.5 Ltr + 250 ml
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.46	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	215.23	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	48.92	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	222.48	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	56.12	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	22.64	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	318.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	14.78	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/06				Report No.: VEL/W/2212230032		
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 4500 FD	0.42	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.26	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.25	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.14	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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Dy. Technical Manager-Micrc



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/GW/07	<b>Report No.:</b>	VEL/W/2212230033
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd, Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Reporting Date:</b>	Dated- 28.06.2022
		<b>Period of Analysis:</b>	28/12/2022
<b>Sample Description:</b>	Ground Water	<b>Receipt Date:</b>	23/12/2022 to 28/12/2022
<b>Sampling Location:</b>	Village- Amalibhauna	<b>Sampling Date:</b>	23/12/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Sampling Type:</b>	20/12/2022
<b>Preservation:</b>	Refrigerated	<b>Sample Quantity:</b>	Grab
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		2.5 Ltr + 250 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)	IS 3025 (P-11)	7.44	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	186.35	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	41.72	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	142.14	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	49.11	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	19.99	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	351.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	17.22	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/07					Report No.: VEL/W/2212230033	
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 4500 FD	0.39	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.92	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.17	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.18	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	--
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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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)





## Test Report

Sample No.: VEL/REGL/W/06		Report No.: VEL/W/2210210001		
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	IS 3025 (P-60)	0.31	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	5.13	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01	0.29	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01	0.30	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01	2.50	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01	0.18	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025 (P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.001)	mg/L
30.	Total Coliform	APHA, 23 <sup>rd</sup> Edition, 9221B,2017	70	MPN/100ml
31.	E.coli	APHA, 23 <sup>rd</sup> Edition, 9221F,2017	Absent	Absent/100ml
32.	Fecal Coliform	IS1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



VARDAN ENVIROLAB  
27.10.2022





# 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/07	Report No.:	VEL/W/2210210002
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bnde Bandar, Tehsil Passore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/10/2022
		Period of Analysis:	21/10/2022 to 27/10/2022
		Receipt Date:	21/10/2022
Sample Description:	Surface Water	Sampling Date:	18/10/2022
Sampling Location:	Mand River (Up Stream)	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr.+250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017		

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.40	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	126.50	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	29.42	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	90.00	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	54.68	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	IS 3025 (P-46)	12.90	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	252.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	22.32	mg/L



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## Test Report

Sample No.: VEL/REGL/W/07			Report No.: VEL/W2210210001	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	IS 3025 (P-60)	0.36	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	4.73	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01	0.22	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P- 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01	1.16	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025 (P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.001)	mg/L
30.	Total. Coliform	APHA, 23 <sup>rd</sup> Edition , 9221B,2017	50	MPN/100ml
31.	E.coli	APHA, 23 <sup>rd</sup> Edition , 9221F,2017	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.





# 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/2210210003
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/10/2022
		Period of Analysis:	21/10/2022 to 27/10/2022
		Receipt Date:	21/10/2022
Sample Description:	Surface Water	Sampling Date:	18/10/2022
Sampling Location:	Mahanadi (Down Stream)	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr.+250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017		

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.42	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	152.32	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	41.75	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	118.54	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	79.68	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	IS 3025 (P-46)	11.70	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	324.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	28.75	mg/L







## Test Report

Sample No.: VEL/REGL/W/08			Report No.: VEL/W/2210210003	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	IS 3025 (P-60)	0.33	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	6.23	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01	0.32	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01	3.08	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01	0.52	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025 (P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.001)	mg/L
30.	Total. Coliform	APHA, 23 <sup>rd</sup> Edition, 9221B,2017	90	MPN/100ml
31.	E.coli	APHA, 23 <sup>rd</sup> Edition, 9221F,2017	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.





# 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/09	Report No.:	VEL/W/2210210004
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/10/2022
		Period of Analysis:	21/10/2022 to 27/10/2022
		Receipt Date:	21/10/2022
Sample Description:	Surface Water	Sampling Date:	18/10/2022
Sampling Location:	Mahanadi (Up Stream)	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr.+250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017		

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.68	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	98.70	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	24.16	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	87.26	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	58.70	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	IS 30259 (P-46)	1.42	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	190.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	7.85	mg/L



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## Test Report

Sample No.: VEL/REGL/W/09			Report No.: VEL/W/2210210004	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	IS 3025 (P-60)	0.26	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.05	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01	0.32	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01	1.80	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025 (P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01	BLQ(LOQ 0.001)	mg/L
30.	Total. Coliforma	APHA, 23 <sup>rd</sup> Edition , 9221B,2017	40	MPN/100ml
31.	E.Coli	APHA, 23 <sup>rd</sup> Edition , 9221F ,2017	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.





# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/W/01	Report No.:	VEL/W/2211120001
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Surface Water	Reporting Date:	16/11/2022
Sampling Location:	Mand River (Down Stream)	Period of Analysis:	12/11/2022 to 16/11/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	12/11/2022
Preservation:	Refrigerated	Sampling Date:	09/11/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.76	--
2.	Colour	IS 3025 (P-4)	3.0	Hazen
3.	Turbidity	IS 3025 (P-10)	2.2	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-8)	173.40	mg/L
6.	Calcium (as Ca)	IS 3025 (P-21)	52.26	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-40)	78.68	mg/L
8.	Chloride (as Cl)	IS:3025( P-23)	91.87	mg/L
9.	Residual Free Chlorine	IS 3025 (P-32)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-26)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	IS 3025 (P-34)	10.45	mg/L
12.	Total Dissolved Solids	APHA 3500 Mg B	310.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-16)	31.06	mg/L



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/REGL/W/01			Report No.: VEL/W/2211120001	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.28	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	4.93	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.26	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.38	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	1.28	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.16	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total Coliform	IS 15185: 2016	60	MPN/100ml
31.	E.coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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## Test Report

Sample Number:	VEL/REGL/W/02	Report No.:	VEL/W/2211120002
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.:	7.8 F-03
		Party Reference No.:	5703005102
			Dated- 28.06.2022
Sample Description:	Surface Water	Reporting Date:	16/11/2022
Sampling Location:	Mand River (Up Stream)	Period of Analysis:	12/11/2022 to 16/11/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	12/11/2022
Preservation:	Refrigerated	Sampling Date:	09/11/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.62	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	138.40	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	32.10	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	84.13	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	62.03	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	14.17	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	244.00 ..	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	20.06	mg/L



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## Test Report

Sample No.: VEL/REGI/W/02			Report No.: VEL/W2211120002	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.31	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.94	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.19	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	1.08	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total Coliform	IS 15185: 2016	50	MPN/100ml
31.	E.coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<2	MPN/100ml

Note: \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.

*Amitabh*  
(Checked By)



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/W/03	Report No.:	VEL/W/2211120003
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Surface Water	Reporting Date:	16/11/2022
Sampling Location:	Mahanadi (Down Stream)	Period of Analysis:	12/11/2022 to 16/11/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	12/11/2022
Preservation:	Refrigerated	Sampling Date:	09/11/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr. +250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.35	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	148.72	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	44.58	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	121.36	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	74.89	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	9.11	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	336.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	20.20	mg/L



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## Test Report

Sample No.: VEL/REGL/W/03			Report No.: VEL/W/2211120003	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.29	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	5.89	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.28	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	2.01	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.36	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total Coliform	IS 15185: 2016	80	MPN/100ml
31.	E.coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.

Amidabh  
(Checked By)



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/W/04	Report No.:	VEL/W/2211120004
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.:	7.8 F-03
		Party Reference No.:	5703005102
			Dated- 28.06.2022
Sample Description:	Surface Water	Reporting Date:	16/11/2022
Sampling Location:	Mahanadi (Up Stream)	Period of Analysis:	12/11/2022 to 16/11/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	12/11/2022
Preservation:	Refrigerated	Sampling Date:	09/11/2022
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.52	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	94.64	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	21.40	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS-3025( P-23)	83.67	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	53.83	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	10.02	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	180.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	9.10	mg/L



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## Test Report

Sample No.: VEL/REGL/W/04			Report No.: VEL/W/221120004	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.21	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	4.24	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.29	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	1.21	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total Coliform	IS 15185: 2016	40	MPN/100ml
31.	E.Coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<2	MPN/100ml

Note: \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.

*(Handwritten Signature)*  
(Checked By)



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## Test Report

Sample Number:	VEL/SW/02	Report No.:	VEL/SW/2212230002
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	28/12/2022
		Period of Analysis:	23/12/2022 to 28/12/2022
Sample Description:	Surface Water	Receipt Date:	23/12/2022
Sampling Location:	Mahanadi (Up Stream)	Sampling Date:	20/12/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Type:	Grab
Preservation:	Refrigerated	Sample Quantity:	2.5 Ltr.+250 ml
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017		

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.32	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	110.40	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	28.61	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	86.47	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	52.00	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	9.48	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	226.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	10.43	mg/L



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## Test Report

Sample No.: VEL/SW/02			Report No.: VEL/SW/2212230002	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.24	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.12	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.22	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	1.26	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total Coliform	IS 1622	34	MPN/100ml
31.	E.Coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



*S.D.*  
28/11/2022  
**SATYA DEV**  
Dy. Technical Manager-Misc



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## Test Report

Sample Number:	VEL/SW/01	Report No.:	VEL/SW/2212230001
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.:	7.8 F-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
Sample Description:	Surface Water	Reporting Date:	28/12/2022
Sampling Location:	Mahanadi (Down Stream)	Period of Analysis:	23/12/2022 to 28/12/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	23/12/2022
Preservation:	Refrigerated	Sampling Date:	20/12/2022
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.63	--
2.	Colour	IS 3025 (P-4)	2.0	Hazen
3.	Turbidity	IS 3025 (P-10)	5.0	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	144.68	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	48.29	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	113.59	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	67.21	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	5.88	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	341.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	23.40	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 Number:	VEL/REGL/WW/05	Report No.:	VEL/WW/2210210005
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/10/2022
		Period of Analysis:	21/10/2022 to 27/10/2022
Sample Description:	Waste Water	Receipt Date:	21/10/2022
Sampling Location :	Ash Pond Effluent	Sampling Date:	17/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Quantity:	3.0 Ltr.
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Sampling Date:	30/08/2022
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.22	--	5.5-9.0
2.	Oil & Grease	Clause No-5 of IS:3025 (P-39)	3.0	mg/L	10.0
3.	Total suspended solid (TSS)	IS: 3025 (P-17)	19.00	mg/L	100.0
4.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.08	mg/L	0.1
5.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.005)	mg/L	0.01
6.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.37	mg/L	2.0
7.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ 0.005)	mg/L	0.2

Note :-BLQ= Below Limit of Quantification,\*\* LOQ= Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/ WW/01	Report No.:	VEL/WW/2211120001
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
Sample Description:	Waste Water	Reporting Date:	16/11/2022
Sampling Location:	Boiler Blow Down	Period of Analysis	12/11/2022 to 16/11/2022
Sample Collected By:	Vardan EnviroLab Representative	Receipt Date	12/11/2022
Parameter Required:	As per Work Order	Sampling Date:	08/11/2022
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Sampling Quantity:	2 Ltr.
		Sampling Type:	Grab
		Packing Type:	Temp. Sealed

## TEST RESULTS

S. No.	Parameters	Protocol	Results	Unit	Prescribed Limits
1.	Total Suspended Solids	IS: 3025 (P-17)	7.23	mg/L	100.0
2.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	BLQ(LOQ 0.4)	mg/L	20.0
3.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L	1.0
4.	Total Residual Chlorine	IS:3025 (P-26)	BLQ(LOQ 0.15)	mg/L	0.5
5.	Iron as Fe	VEL/STP/ICP/W-01, Issue No. - 01, Issue date 01/11/2021	0.35	mg/L	1.0

Note: \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification  
\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/REGL/ WW/02	<b>Report No.:</b>	VEL/WW/2210210002
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village –Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102 Dated- 28.06.2022
<b>Sample Description:</b>	Waste Water	<b>Reporting Date:</b>	16/11/2022
<b>Sampling Location:</b>	Cooling Tower Water	<b>Period of Analysis:</b>	12/11/2022 to 16/11/2022
<b>Sample Collected By:</b>	Vardan EnviroLab Representative	<b>Receipt Date:</b>	12/11/2022
<b>Parameter Required:</b>	As per Work Order	<b>Sampling Date:</b>	08/11/2022
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017	<b>Sampling Quantity:</b>	2 Ltr.
		<b>Sampling Type:</b>	Grab
		<b>Packing Type:</b>	Temp. Sealed

### TEST RESULTS

S. No.	Parameters	Test Method	Result	Unit	Prescribed Limits
1.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. - 01, Issue date 01/11/2021	0.41	mg/L	100.0
2.	Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No. - 01, Issue date 01/11/2021	0.26	mg/L	20.0
3.	Phosphate	IS:3025 (P-31)	0.49	mg/L	1.0
4.	Free Available Chlorine	IS:3025 (P-26)	0.29	mg/L	0.5

\*\*\*End of Report\*\*\*



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

## Test Report

<b>Sample Number:</b>	VEL/REGL/WW/03	<b>Report No.:</b>	VEL/WW/2211120003
<b>Name &amp; Address of the Project:</b>	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-:</b>	28.06.2022
		<b>Reporting Date:</b>	16/11/2022
		<b>Period of Analysis:</b>	12/11/2022 to 16/11/2022
<b>Sample Description:</b>	Effluent Water	<b>Receipt Date:</b>	12/11/2022
<b>Sample Location:</b>	ETP Plant (ETP Inlet)	<b>Sampling Date:</b>	08/11/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017	<b>Sample Quantity:</b>	2.0 Ltr
		<b>Parameter required:</b>	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units
1.	pH (at 25°C)	IS:3025 (P-11)	5.82	--
2.	COD	APHA, 5220 B Open Reflux Method	287.11	mg/L
3.	BOD (3 Days at 27°C)	IS 3025 (P-44)	81.34	mg/L
4.	Total Suspended Solids	IS: 3025 (P-17)	52.00	mg/L
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	6.20	mg/L

\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/REGL/WW/04	<b>Report No.:</b>	VEL/WW/2211120004
<b>Name &amp; Address of the Project:</b>	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated:</b>	28.06.2022
		<b>Reporting Date:</b>	16/11/2022
		<b>Period of Analysis:</b>	12/11/2022 to 16/11/2022
<b>Sample Description:</b>	Effluent Water	<b>Receipt Date:</b>	12/11/2022
<b>Sample Location:</b>	ETP Plant (ETP Outlet)	<b>Sampling Date:</b>	08/11/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017	<b>Sample Quantity:</b>	2.0 Ltr
		<b>Parameter required:</b>	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25°C)	IS:3025 (P-11)	6.44	--	5.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	53.24	mg/L	250
3.	BOD (5 Days at 20°C)	IS 3025 (P-44)	17.14	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	8.00	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.60	mg/L	10

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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/WW/05	Report No.:	VEL/WW/2211120005
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bada Bhandar, Tehsil Passore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	16/11/2022
		Period of Analysis:	12/11/2022 to 16/11/2022
Sample Description:	Waste Water	Receipt Date:	12/11/2022
Sampling Location :	Ash Pond Effluent	Sampling Date:	08/11/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Quantity:	3.0 Ltr.
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Sampling Date:	30/08/2022
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.38	-	5.5-9.0
2.	Oil & Grease	Clause No-5 of IS:3025 (P-39)	3.52	mg/L	10.0
3.	Total suspended solid (TSS)	IS: 3025 (P-17)	16.00	mg/L	100.0
4.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.06	mg/L	0.1
5.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.005)	mg/L	0.01
6.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.42	mg/L	2.0
7.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.005)	mg/L	0.2

Note :-BLQ= Below Limit of Quantification.\*\* LOQ= Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/WW/06	Report No.:	VEL/WW/2211120006
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-:	28.06.2022
		Reporting Date:	16/11/2022
		Period of Analysis:	12/11/2022 to 16/11/2022
Sample Description:	Treated Sewage Water	Receipt Date:	12/11/2022
Sample Location:	STP Plant (STP Outlet)	Sampling Date:	08/11/2022
Sample Collected by:	Vardan EnviroLab Representative	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.37	--	6.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	48.40	mg/L	250
3.	BOD (5 Days at 20 °C)	IS 3025 (P-44)	14.26	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	10.00	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.50	mg/L	10

\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/WW/07	Report No.:	VEL/WW/2211120007
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Treated Sewage Water	Party Reference No.:	5703005102
Sample Location:	STP Plant (STP Inlet)	Dated- 28.06.2022	16/11/2022
Sample Collected by:	Vardan EnviroLab Representative	Reporting Date:	12/11/2022 to 16/11/2022
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Period of Analysis:	12/11/2022
		Receipt Date:	08/11/2022
		Sampling Date:	Refrigerated
		Preservation:	2.0 Ltr
		Sample Quantity:	As per Work Order
		Parameter required:	

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units
1.	pH (at 25 °C)	IS:3025 (P-11)	7.63	--
2.	COD	APHA, 5220 B Open Reflux Method	210.00	mg/L
3.	BOD (3 Days at 27 °C)	IS 3025 (P-44)	52.03	mg/L
4.	Total Suspended Solids	IS: 3025 (P-17)	67.00	mg/L
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	7.80	mg/L

\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/WW/01	<b>Report No.:</b>	VEL/WW/2212230004
<b>Name &amp; Address of the Project:</b>	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
			Dated- 28.06.2022
<b>Sample Description:</b>	Waste Water	<b>Reporting Date:</b>	28/12/2022
<b>Sample Location:</b>	STP Plant (STP Outlet)	<b>Period of Analysis:</b>	23/12/2022 to 28/12/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Receipt Date:</b>	23/12/2022
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017	<b>Sampling Date:</b>	19/12/2022
		<b>Preservation:</b>	Refrigerated
		<b>Sample Quantity:</b>	2.0 Ltr
		<b>Parameter required:</b>	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	6.88	--	6.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	50.20	mg/L	250
3.	BOD (3 Days at 27 °C)	IS 3025 (P-44)	12.68	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	9.00	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.40	mg/L	10

\*\*\*End of Report\*\*\*



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## Test Report

<b>Sample Number:</b>	VEL/WW/02	<b>Report No.:</b>	VEL/WW/2212230005
<b>Name &amp; Address of the Project:</b>	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
		<b>Reporting Date:</b>	28/12/2022
		<b>Period of Analysis:</b>	23/12/2022 to 28/12/2022
<b>Sample Description:</b>	Effluent Water	<b>Receipt Date:</b>	23/12/2022
<b>Sample Location:</b>	ETP Plant (ETP Inlet)	<b>Sampling Date:</b>	19/12/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017	<b>Sample Quantity:</b>	2.0 Ltr
		<b>Parameter required:</b>	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units
1.	pH (at 25 °C)	IS:3025 (P-11)	6.13	--
2.	COD	APHA, 5220 B Open Reflux Method	281.34	mg/L
3.	BOD (3 Days at 27°C)	IS 3025 (P-44)	78.59	mg/L
4.	Total Suspended Solids	IS: 3025 (P-17)	62.00	mg/L
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	5.00	mg/L

\*\*\*End of Report\*\*\*



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ISO 9001 | ISO 14001 | ISO 45001

## Test Report

<b>Sample Number:</b>	VEL/WW/03	<b>Report No.:</b>	VEL/WW/2212230006
<b>Name &amp; Address of the Project:</b>	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Passore, Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
		<b>Reporting Date:</b>	28/12/2022
		<b>Period of Analysis:</b>	23/12/2022 to 28/12/2022
<b>Sample Description:</b>	Effluent Water	<b>Receipt Date:</b>	23/12/2022
<b>Sample Location:</b>	ETP Plant (ETP Outlet)	<b>Sampling Date:</b>	19/12/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017	<b>Sample Quantity:</b>	2.0 Ltr
		<b>Parameter required:</b>	As per Work Order

### TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.12	--	5.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	62.00	mg/L	250
3.	BOD (3 Days at 27 °C)	IS 3025 (P-44)	15.92	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	7.00	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.80	mg/L	10

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/WW/04	Report No.:	VEL/WW/2212230007
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	28/12/2022
Sample Description:	Waste Water	Period of Analysis:	23/12/2022 to 28/12/2022
Sampling Location :	Ash Pond Water	Receipt Date:	23/12/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	19/12/2022
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Sampling Quantity:	3.0 Ltr.
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.44	--	5.5-9.0
2.	Oil & Grease	Clause No-5 of IS:3025 (P-39)	3.20	mg/L	10.0
3.	Total suspended solid (TSS)	IS: 3025 (P-17)	18.00	mg/L	100.0
4.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.12	mg/L	0.1
5.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.005)	mg/L	0.01
6.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.38	mg/L	2.0
7.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.005)	mg/L	0.2

Note :-BLQ= Below Limit of Quantification.\*\* LOQ= Limit of Quantification.



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

## Test Report

<b>Sample Number:</b>	VEL/WW/05	<b>Report No.:</b>	VEL/WW/2212230008
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office - Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102 Dated- 28.06.2022
<b>Sample Description:</b>	Waste Water	<b>Reporting Date:</b>	28/12/2022
<b>Sampling Location:</b>	Cooling Tower Water	<b>Period of Analysis</b>	23/12/2022 to 28/12/2022
<b>Sample Collected By:</b>	Vardan EnviroLab Representative	<b>Receipt Date</b>	23/12/2022
<b>Parameter Required:</b>	As per Work Order	<b>Sampling Date:</b>	19/12/2022
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017	<b>Sampling Quantity:</b>	2 Ltr.
		<b>Sampling Type:</b>	Grab
		<b>Packing Type:</b>	Temp. Sealed

## TEST RESULTS

S. No.	Parameters	Test Method	Result	Unit	Prescribed Limits
1.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. - 01, Issue date 01/11/2021	0.44	mg/L	100.0
2.	Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No. - 01, Issue date 01/11/2021	0.24	mg/L	20.0
3.	Phosphate	IS:3025 (P-31)	0.39	mg/L	1.0
4.	Free Available Chlorine	IS:3025 (P-26)	0.31	mg/L	0.5

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ISO 9001 | ISO 14001 | ISO 45001

## Test Report

<b>Sample Number:</b>	VEL/WW/06	<b>Report No.:</b>	VEL/WW/2212230009
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village-Chhote Bhandar, Post Office-Bade Bandar, Tehsil- Pussore, Dist-Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
			Dated- 28.06.2022
		<b>Reporting Date:</b>	28/12/2022
		<b>Period of Analysis</b>	23/12/2022 to 28/12/2022
		<b>Receipt Date</b>	23/12/2022
<b>Sample Description:</b>	Waste Water	<b>Sampling Date:</b>	19/12/2022
<b>Sampling Location:</b>	Boiler Blow Down	<b>Sampling Quantity:</b>	2 Ltr.
<b>Sample Collected By:</b>	Vardan EnviroLab Representative	<b>Sampling Type:</b>	Grab
<b>Parameter Required:</b>	As per Work Order	<b>Packing Type:</b>	Temp. Sealed
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017		

## TEST RESULTS

S. No.	Parameters	Protocol	Results	Unit	Prescribed Limits
1.	Total Suspended Solids	IS: 3025 (P-17)	7.35	mg/L	100.0
2.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	BLQ(LOQ 0.4)	mg/L	20.0
3.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L	1.0
4.	Total Residual Chlorine	IS:3025 (P-26)	BLQ(LOQ 0.15)	mg/L	0.5
5.	Iron as Fe	VEL/STP/ICP/W-01, Issue No. - 01, Issue date 01/11/2021	0.38	mg/L	1.0

Note: \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification  
\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/REGL/ST/01	Report No.:	VEL/ST/2211120001
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	16/11/2022
		Period of Analysis:	12/11/2022 to 16/11/2022
		Receipt Date:	12/11/2022

Sample Description: Stack Emission Monitoring

### General Information:-

Sample Collected By	: VEL Representative
Date & Time of Sampling	: 08/11/2022
Location	: TPP
Sampling Duration (Minutes)	: 36.0
Meteorological Condition	: Clear Sky
Stack Attached To	: TPP
Stack Diameter (m)	: 7.5
Stack Height (m)	: 275
Instrument Calibration Status	: Calibrated
Ambient Temperature - Ta (°C)	: 29.0
Temperature of Stack Gases - Ts (°C)	: 124.0
Velocity of Stack Gases (m/sec.)	: 14.60
Flow rate of PM (LPM)	: 25.0
Sampling Condition	: Isokinetic
Protocol Used	: IS: 11255 & EPA

## TEST RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1), Gravimetric Method	37.18	mg/Nm <sup>3</sup>	50.0
2.	Sulphur Dioxide (as SO <sub>2</sub> )	IS: 11255 (P-2), Titrimetric Method	554.86	mg/Nm <sup>3</sup>	200.0
3.	Oxides of Nitrogen (as NO <sub>2</sub> )	VEL/ENV/STP/ST/FGA/01, Issue No.- 01	215.27	mg/Nm <sup>3</sup>	450.0
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No-01, Issue Date-01/11/2021:2021	BLQ(LOQ 0.001)	mg/Nm <sup>3</sup>	0.03

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification,  
\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/S/01	Report No.:	VEL/S/2212230008
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Report Date:	28/12/2022
		Period of Analysis:	23/12/2022 to 28/12/2022
		Receipt Date:	23/12/2022

Sample Description: Stack Emission Monitoring

**General Information:-**

Sample Collected By	: VEL Representative
Date & Time of Sampling	: 19/12/2022
Location	: Stack monitoring (Unit- 1)
Sampling Duration (Minutes)	: 37.0
Meteorological Condition	: Clear Sky
Stack Attached To	: TPP
Stack Diameter (m)	: 7.5
Stack Height (m)	: 275
Instrument Calibration Status	: Calibrated
Ambient Temperature - Ta (°C)	: 25.0
Temperature of Stack Gases - Ts (°C)	: 128.0
Velocity of Stack Gases (m/sec.)	: 15.80
Flow rate of PM (LPM)	: 25.0
Flow rate of Gas(LPM)	: 2.0
Sampling Condition	: Isokinetic
Protocol Used	: IS: 11255 & EPA

## TEST RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1), Gravimetric Method	31.40	mg/Nm <sup>3</sup>	50.0
2.	Sulphur Dioxide (as SO <sub>2</sub> )	IS: 11255 (P-2), Titrimetric Method	561.24	mg/Nm <sup>3</sup>	200.0
3.	Oxides of Nitrogen (as NO <sub>2</sub> )	VEL/ENV/STP/ST/FGA/01, Issue No.- 01	221.39	mg/Nm <sup>3</sup>	450.0
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No-01, Issue Date-01/11/2021:2021	BLQ(LOQ 0.001)	mg/Nm <sup>3</sup>	0.03

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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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 <sub>2</sub> , NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , 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.



# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/01	Report No.:	VEL/A/2301200001
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Report Date:	23/01/2023
Sample Description :	Ambient Air Quality Monitoring	Period of Analysis:	20/01/2023 to 23/01/2023
		Receipt Date:	20/01/2023

### General Information:-

Sampling Location	: Near Site Office
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/02/06
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'26.85"
Longitude	: 83°16'31.94"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 16/01/2023 to 17/01/2023
Time of Sampling	: 11:15 AM to 11:15 AM
Ambient Temperature (°C)	: Min.12°C, Max. 30 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24)	51.24	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	76.10	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	16.45	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	8.16	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.77	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/02	Report No.:	VEL/A/2301200004
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
Sample Description :	Ambient Air Quality Monitoring	Report Date:	23/01/2023
		Period of Analysis:	20/01/2023 to 23/01/2023
		Receipt Date:	20/01/2023

### General Information:-

Sampling Location	: Swich Yard
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/04/10
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'22.16"
Longitude	: 83°16'29.00"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 16/01/2023 to 17/01/2023
Time of Sampling	: 11:30 AM to 11:30 AM
Ambient Temperature (°C)	: Min.13°C, Max. 31 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24)	47.16	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	70.80	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	24.02	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	8.10	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.56	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

**Sample Number:** VEL/ A/03  
**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/A/2301200005  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5703005102  
Dated- 28.06.2022

**Report Date:** 23/01/2023  
**Period of Analysis:** 20/01/2023 to 23/01/2023  
**Receipt Date:** 20/01/2023

**Sample Description:** Ambient Air Quality Monitoring

### General Information:-

**Sampling Location** : Station no.3 CAAQMS  
**Sample Collected By** : Vardan EnviroLab Representative  
**Sampling Equipment Used** : RDS & FPS  
**Instrument Code** : VEL/RDS/FPS/01/04  
**Instrument Calibration Status** : Calibrated  
**Latitude (N)** : 21°44'21.24"  
**Longitude (E)** : 83°16'40.20"  
**Meteorological Condition During Monitoring** : Clear Sky  
**Date of Sampling** : 16/01/2023 to 17/01/2023  
**Time of Sampling** : 12:25 PM to 12:25 PM  
**Ambient Temperature (°C)** : Min.13°C, Max. 31 °C  
**Surrounding Activity** : Human, Vehicular & other Activities  
**Scope of Monitoring** : Regulatory Requirement  
**Sampling & Analysis Protocol** : CPCB Guidelines & IS-5182  
**Sampling Duration** : 24 Hrs.  
**Parameter Required** : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	43.72	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	68.66	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	23.59	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	8.22	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.57	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

**Sample Number:** VEL/ A/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/A/2301200006  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5703005102  
Dated- 28.06.2022

**Report Date:** 23/01/2023  
**Period of Analysis:** 20/01/2023 to 23/01/2023  
**Receipt Date:** 20/01/2023

**Sample Description:** Ambient Air Quality Monitoring

### General Information:-

**Sampling Location** : Village - Bade Bhandar  
**Sample Collected By** : Vardan EnviroLab Representative  
**Sampling Equipment Used** : RDS & FPS  
**Instrument Code** : VEL/RDS/FPS/02/06  
**Instrument Calibration Status** : Calibrated  
**Latitude (N)** : 21°44'28.80"  
**Longitude (E)** : 83°17'05.06"  
**Meteorological Condition During Monitoring** : Clear Sky  
**Date of Sampling** : 17/01/2023 to 18/01/2023  
**Time of Sampling** : 11:45 AM to 11:45 AM  
**Ambient Temperature (°C)** : Min.13°C, Max. 32 °C  
**Surrounding Activity** : Human, Vehicular & other Activities  
**Scope of Monitoring** : Regulatory Requirement  
**Sampling & Analysis Protocol** : CPCB Guidelines & IS-5182  
**Sampling Duration** : 24 Hrs.  
**Parameter Required** : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	36.16	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	57.91	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	20.68	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	6.01	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.60	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/05	Report No.:	VEL/A/2301200007
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Report Date:	23/01/2023
		Period of Analysis:	20/01/2023 to 23/01/2023
		Receipt Date:	20/01/2023

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location	: Village - Chhote Bhandar
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/04/10
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'21.24"
Longitude (E)	: 83°16'43.22"
Meteorological Condition During Monitoring	: Clear Sky
Date of Sampling	: 17/01/2023 to 18/01/2023
Time of Sampling	: 12:05 PM to 12:05 PM
Ambient Temperature (°C)	: Min.13°C, Max. 32 °C
Surrounding Activity	: Human, Vehicular & Other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	34.70	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	55.28	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	20.38	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	5.24	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.51	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/A/06	Report No.:	VEL/A/2301200009
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	23/01/2023
		Period of Analysis:	20/01/2023 to 23/01/2023
		Receipt Date:	20/01/2023
Sample Description:	Ambient Air Quality Monitoring		

### General Information:-

Sampling Location	: Village - Amalibhauna
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01/04
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'13.18"
Longitude (E)	: 83°16'29.06"
Meteorological Condition During Monitoring	: Clear Sky
Date of Sampling	: 17/01/2023 to 18/01/2023
Time of Sampling	: 12:45 PM to 12:45 PM
Ambient Temperature (°C)	: Min.13°C, Max. 32 °C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	39.48	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	76.10	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	18.23	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	6.89	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.56	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/01	Report No.:	VEL/A/2302230001
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	27/02/2023
Sample Description :	Ambient Air Quality Monitoring	Period of Analysis:	23/02/2023 to 27/02/2023
		Receipt Date:	23/02/2023

### General Information:-

Sampling Location	: Near Site Office
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/05/08
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'26.85"
Longitude	: 83°16'31.94"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 17/02/2023 to 18/02/2023
Time of Sampling	: 11:25 AM to 11:25 AM
Ambient Temperature (°C)	: Min.15°C, Max. 35 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24)	45.63	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	79.25	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	14.08	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	8.69	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.81	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification, \*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/02	Report No.:	VEL/A/2302230002
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Report Date:	27/02/2023
Sample Description :	Ambient Air Quality Monitoring	Period of Analysis:	23/02/2023 to 27/02/2023
		Receipt Date:	23/02/2023

### General Information:-

Sampling Location	: Main Gate
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/06/09
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'22.16"
Longitude	: 83°16'29.00"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 17/02/2023 to 18/02/2023
Time of Sampling	: 11:45 AM to 11:45 AM
Ambient Temperature (°C)	: Min.15°C, Max. 35 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24)	49.24	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	68.01	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P-6)	25.12	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P-2)	7.66	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.46	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/03	Report No.:	VEL/A/2302230003
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	27/02/2023
		Period of Analysis:	23/02/2023 to 27/02/2023
		Receipt Date:	23/02/2023

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location	: Station No.3 AAQMS
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS &FPS
Instrument Code	: VEL/RDS/FPS/02/07
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'21.24"
Longitude (E)	: 83°16'40.20"
Meteorological Condition During Monitoring	: Clear Sky
Date of Sampling	: 17/02/2023 to 18/02/2023
Time of Sampling	: 12:10 PM to 12:10 PM
Ambient Temperature (°C)	: Min.15°C, Max. 35 °C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	41.78	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	65.24	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	21.87	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	8.01	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.47	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/ A/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/A/2302230004  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Report Date: 27/02/2023  
Period of Analysis: 23/02/2023 to 27/02/2023  
Receipt Date: 23/02/2023

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location : Village - Bade Bhandar  
Sample Collected By : Vardan EnviroLab Representative  
Sampling Equipment Used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/03/06  
Instrument Calibration Status : Calibrated  
Latitude (N) : 21°44'28.80"  
Longitude (E) : 83°17'05.06"  
Meteorological Condition During Monitoring : Clear Sky  
Date of Sampling : 17/02/2023 to 18/02/2023  
Time of Sampling : 12:30 PM to 12:30 PM  
Ambient Temperature (°C) : Min.15°C, Max. 35 °C  
Surrounding Activity : Human, Vehicular & other Activities  
Scope of Monitoring : Regulatory Requirement  
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182  
Sampling Duration : 24 Hrs.  
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	39.47	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	61.33	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	21.67	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	5.48	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.62	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification,  
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## Test Report

Sample Number:	VEL/ A/05	Report No.:	VEL/A/2302230005
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	27/02/2023
		Period of Analysis:	23/02/2023 to 27/02/2023
		Receipt Date:	23/02/2023

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location	: Village - Chhote Bhandar
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/04/10
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'21.24"
Longitude (E)	: 83°16'43.22"
Meteorological Condition During Monitoring	: Clear Sky
Date of Sampling	: 17/02/2023 to 18/02/2023
Time of Sampling	: 12:50 PM to 12:50 PM
Ambient Temperature (°C)	: Min.15°C, Max. 35 °C
Surrounding Activity	: Human, Vehicular & Other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	31.53	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	52.18	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	17.30	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	6.16	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.59	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification, \*\*\*End of Report\*\*\*

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# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/A/06  
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/A/2302230006  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Report Date: 27/02/2023  
Period of Analysis: 23/02/2023 to 27/02/2023  
Receipt Date: 23/02/2023

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location : Village - Amalibhauna  
Sample Collected By : Vardan EnviroLab Representative  
Sampling Equipment Used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/01/04  
Instrument Calibration Status : Calibrated  
Latitude (N) : 21°44'13.18"  
Longitude (E) : 83°16'29.06"  
Meteorological Condition During Monitoring : Clear Sky  
Date of Sampling : 17/02/2023 to 18/02/2023  
Time of Sampling : 01:10 PM to 01:10 PM  
Ambient Temperature (°C) : Min.15°C, Max. 35 °C  
Surrounding Activity : Human, Vehicular & other Activities  
Scope of Monitoring : Regulatory Requirement  
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182  
Sampling Duration : 24 Hrs.  
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	37.62	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	72.48	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	15.34	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	7.08	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.51	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/ A/01  
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/2303200004  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Report Date: 24/03/2023  
Period of Analysis: 20/03/2023 to 24/03/2023  
Receipt Date: 20/03/2023

### General Information:-

Sampling Location : Near Site Office  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/05/08  
Instrument Calibration Status : Calibrated  
Latitude : 21°44'26.85"  
Longitude : 83°16'31.94"  
Meteorological condition during monitoring : Clear Sky  
Date of Sampling : 15/03/2023 to 16/03/2023  
Time of Sampling : 11:15 AM to 11:15 AM  
Ambient Temperature (°C) : Min.21°C, Max. 40 °C  
Surrounding Activity : Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24)	44.00	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	75.12	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	18.48	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	6.44	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.86	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification, \*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/02	Report No.:	VEL/A/2303200005
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	24/03/2023
Sample Description :	Ambient Air Quality Monitoring	Period of Analysis:	20/03/2023 to 24/03/2023
		Receipt Date:	20/03/2023

### General Information:-

Sampling Location	: Near Fire Building
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/06/09
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'23.71"
Longitude	: 83°16'31.08"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 15/03/2023 to 16/03/2023
Time of Sampling	: 11:30 AM to 11:30 AM
Ambient Temperature (°C)	: Min.21°C, Max. 40 °C
Surrounding Activity	: Human , Vehicular & other 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 <sub>2.5</sub> )	IS 5182 (P-24)	40.13	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	65.87	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	23.47	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	8.33	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.62	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/03	Report No.:	VEL/A/2303200006
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	24/03/2023
		Period of Analysis:	20/03/2023 to 24/03/2023
		Receipt Date:	20/03/2023
Sample Description:	Ambient Air Quality Monitoring		

### General Information:-

Sampling Location	: Village - Bade Bhandar
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/03/06
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'28.80"
Longitude (E)	: 83°17'05.06"
Meteorological Condition During Monitoring	: Partially Cloudy
Date of Sampling	: 16/03/2023 to 17/03/2023
Time of Sampling	: 12:00 PM to 12:00 PM
Ambient Temperature (°C)	: Min. 22°C, Max. 38 °C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

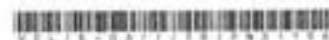
S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	37.68	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	56.03	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	16.13	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	7.12	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.54	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/ A/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/A/2303200007  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Report Date: 24/03/2023  
Period of Analysis: 20/03/2023 to 24/03/2023  
Receipt Date: 20/03/2023

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location : Village - Chhote Bhandar  
Sample Collected By : Vardan EnviroLab Representative  
Sampling Equipment Used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/04/10  
Instrument Calibration Status : Calibrated  
Latitude (N) : 21°44'21.24"  
Longitude (E) : 83°16'43.22"

### Meteorological Condition During Monitoring

Date of Sampling : Partially Cloudy  
Time of Sampling : 16/03/2023 to 17/03/2023  
Ambient Temperature (°C) : 12:15 PM to 12:15 PM  
Surrounding Activity : Min. 12°C, Max. 38 °C  
Scope of Monitoring : Human, Vehicular & Other Activities  
Sampling & Analysis Protocol : Regulatory Requirement  
Sampling Duration : CPCB Guidelines & IS-5182  
Parameter Required : 24 Hrs.  
As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	33.78	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	50.61	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	16.89	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	5.91	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.51	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification, \*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/A/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/A/2303200008  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Report Date: 24/03/2023  
Period of Analysis: 20/03/2023 to 24/03/2023  
Receipt Date: 20/03/2023

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location : Village - Amalibhauna  
Sample Collected By : Vardan EnviroLab Representative  
Sampling Equipment Used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/01/04  
Instrument Calibration Status : Calibrated  
Latitude (N) : 21°44'13.18"  
Longitude (E) : 83°16'29.06"  
Meteorological Condition During Monitoring : Partially Cloudy  
Date of Sampling : 16/03/2023 to 17/03/2023  
Time of Sampling : 12:30 PM to 12:30 PM  
Ambient Temperature (°C) : Min.22°C, Max. 38 °C  
Surrounding Activity : Human, Vehicular & other Activities  
Scope of Monitoring : Regulatory Requirement  
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182  
Sampling Duration : 24 Hrs.  
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	34.78	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	61.73	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P-6)	13.87	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P-2)	5.06	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.53	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ A/06	Report No.:	VEL/A/2303200009
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	24/03/2023
		Period of Analysis:	20/03/2023 to 24/03/2023
		Receipt Date:	20/03/2023

Sample Description: Ambient Air Quality Monitoring

### General Information:-

Sampling Location	: Village- Kathli
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/02/07
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'21.24"
Longitude (E)	: 83°16'40.20"
Meteorological Condition During Monitoring	: Partially Cloudy
Date of Sampling	: 16/03/2023 to 17/03/2023
Time of Sampling	: 11:45 AM to 11:45 AM
Ambient Temperature (°C)	: Min.22°C, Max. 38 °C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

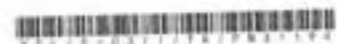
S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM <sub>2.5</sub> )	IS 5182 (P-24)	42.59	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS 5182 (P-23)	57.86	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (P 6)	17.44	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (P 2)	6.18	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10), NDIR Method	0.53	mg/m <sup>3</sup>	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, 01/11/2021	BLQ(LOQ-1.0)	ng/m <sup>3</sup>	--

Note:- STP-Standard Testing Procedure, \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification, \*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/N/01	Report No.:	VEL/N/2301200003
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	23/01/2023
		Receipt Date:	20/01/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Near Site Office
Instrument Used	: Sound Level Meter-01
Instrument Code	: VEL/SLM/07
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Clear Sky
Date of Monitoring	: 16/01/2023 to 17/01/2023
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min, 12°C & Max, 30 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989	68.4	52.5
2	L <sub>Min</sub>	IS 9989	45.8	34.2
3	L <sub>eq</sub>	IS 9989	54.06	42.24

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, 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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number: VEL/N/02  
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.  
Village - Chhote Bhandar,  
Post Office- Bade Bandar, Tehsil- Passore,  
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2301200007  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 23/01/2023  
Receipt Date: 20/01/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Switch yard  
Instrument Used : Sound Level Meter-04  
Instrument Code : VEL/SLM/03  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 16/01/2023 to 17/01/2023  
Time of Monitoring : 06:15 AM to 06:15AM  
Ambient Temperature (°C) : Min. 12°C & Max. 30 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989	56.8	50.6
2	L <sub>Min</sub>	IS 9989	43.2	37.5
3	L <sub>eq</sub>	IS 9989	52.11	44.83

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, 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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number: VEL/N/03  
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/N/2301200008  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022

Reporting Date: 23/01/2023  
Receipt Date: 20/01/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Station no.3 CAAQMS  
Instrument Used : Sound Level Meter-04  
Instrument Code : VEL/SLM/01  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 16/01/2023 to 17/01/2023  
Time of Monitoring : 06:15 AM to 06:15AM  
Ambient Temperature (°C) : Min.12°C & Max. 30 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	$L_{Max}$	IS 9989	62.1	52.9
2	$L_{Min}$	IS 9989	45.6	39.4
3	$L_{eq}$	IS 9989	53.76	44.84

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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

<b>Sample Number:</b>	VEL/N/04	<b>Report No.:</b>	VEL/N/2301200009
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village – Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102 Dated- 28.06.2022
		<b>Reporting Date:</b>	23/01/2023
		<b>Receipt Date:</b>	20/01/2023

**Sample Description:** Ambient Noise Level Monitoring

### General Information:-

<b>Sample Collected By</b>	: Vardan EnviroLab Representative
<b>Sampling Location</b>	: Village- Bade Bhandar
<b>Instrument Used</b>	: Sound Level Meter-04
<b>Instrument Code</b>	: VEL/SLM/06
<b>Instrument Calibration Status</b>	: Calibrated
<b>Meteorological Condition During Monitoring</b>	: Clear Sky
<b>Date of Monitoring</b>	: 17/01/2023 to 18/01/2023
<b>Time of Monitoring</b>	: 06:00 AM to 06:00 AM
<b>Ambient Temperature (°C)</b>	: Min.13°C & Max. 32 °C
<b>Surrounding Activity</b>	: Human, Vehicular and other Activities
<b>Sampling Duration</b>	: 24 Hrs.
<b>Scope of Monitoring</b>	: Regulatory Requirement
<b>Protocol Used</b>	: IS 9989 & CPCB Guidelines
<b>Parameter Required</b>	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Max}$	IS 9989	58.6	49.3
2.	$L_{Min}$	IS 9989	43.2	39.1
3.	$L_{eq}$	IS 9989	50.33	42.81

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 horns, 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 (Hr)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

<b>Sample Number:</b>	VEL/N/05	<b>Report No.:</b>	VEL/N/2301200010
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd, Village – Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
		<b>Reporting Date:</b>	23/01/2023
		<b>Receipt Date:</b>	20/01/2023

**Sample Description:** Ambient Noise Level Monitoring

### General Information:-

<b>Sample Collected By</b>	:	Vardan EnviroLab Representative
<b>Sampling Location</b>	:	Village-Chhote Bhandar
<b>Instrument Used</b>	:	Sound Level Meter-03
<b>Instrument Code</b>	:	VEL/SLM/05
<b>Instrument Calibration Status</b>	:	Calibrated
<b>Meteorological Condition During Monitoring</b>	:	Clear Sky
<b>Date of Monitoring</b>	:	17/01/2023 to 18/01/2023
<b>Time of Monitoring</b>	:	06:00 AM to 06:00AM
<b>Ambient Temperature (°C)</b>	:	Min.13°C & Max. 32 °C
<b>Surrounding Activity</b>	:	Human, Vehicular and other Activities
<b>Sampling Duration</b>	:	24 Hrs.
<b>Scope of Monitoring</b>	:	Regulatory Requirement
<b>Protocol Used</b>	:	IS 9989 & CPCB Guidelines
<b>Parameter Required</b>	:	As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Max}$	IS 9989	61.2	55.8
2.	$L_{Min}$	IS 9989	48.1	41.4
3.	$L_{eq}$	IS 9989	54.33	46.66

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.  
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### Terms & Conditions:

- The results reported herein are only valid for the sample tested. In case sample is not drawn the results apply to the sample as received.
- This test report is valid for 12 months from the date of issue. It cannot be used in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of the certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the withdrawal of the accepted test report. The test samples will be retained only for specific period.
- The report no. with Sample Reference Report.
- This test report will not be used for publicity or advertising or media purpose without prior written permission in the laboratory.
- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/N/06	<b>Report No.:</b>	VEL/N/2301200011
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
		<b>Reporting Date:</b>	23/01/2023
		<b>Receipt Date:</b>	20/01/2023

**Sample Description:** Ambient Noise Level Monitoring

### General Information:-

<b>Sample Collected By</b>	: Vardan EnviroLab Representative
<b>Sampling Location</b>	: Village-Kathli
<b>Instrument Used</b>	: Sound Level Meter-02
<b>Instrument Code</b>	: VEL/SLM/12
<b>Instrument Calibration Status</b>	: Calibrated
<b>Meteorological Condition During Monitoring</b>	: Clear Sky
<b>Date of Monitoring</b>	: 17/01/2023 to 18/01/2023
<b>Time of Monitoring</b>	: 06:00 AM to 06:00AM
<b>Ambient Temperature (°C)</b>	: Min.13°C & Max. 32 °C
<b>Surrounding Activity</b>	: Human, Vehicular and other Activities
<b>Sampling Duration</b>	: 24 Hrs.
<b>Scope of Monitoring</b>	: Regulatory Requirement
<b>Protocol Used</b>	: IS 9989 & CPCB Guidelines
<b>Parameter Required</b>	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Max}$	IS 9989	65.2	56.8
2.	$L_{Min}$	IS 9989	45.1	37.4
3.	$L_{eq}$	IS 9989	51.76	43.02

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.

### Terms & Conditions

- The results reported in this report are based on the sample as received.
- This test report is valid for use in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of this certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of unapproved test report. The test samples will be retained only for specific period.
- The report no. with Sample Agreement Report.
- This test report will not be used for publicity or advertising or media purpose without prior written permission on the laboratory.
- Going opinions does not imply that the lab has tested the sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/N/07	<b>Report No.:</b>	VEL/N/2301200012
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd, Village – Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
		<b>Reporting Date:</b>	23/01/2023
		<b>Receipt Date:</b>	20/01/2023

**Sample Description:** Ambient Noise Level Monitoring

### General Information:-

<b>Sample Collected By</b>	: Vardan EnviroLab Representative
<b>Sampling Location</b>	: Village- Amalibhauna
<b>Instrument Used</b>	: Sound Level Meter-01
<b>Instrument Code</b>	: VEL/SLM/04
<b>Instrument Calibration Status</b>	: Calibrated
<b>Meteorological Condition During Monitoring</b>	: Clear Sky
<b>Date of Monitoring</b>	: 17/01/2023 to 18/01/2023
<b>Time of Monitoring</b>	: 06:00 AM to 06:00AM
<b>Ambient Temperature (°C)</b>	: Min.13°C & Max. 32.°C
<b>Surrounding Activity</b>	: Human, Vehicular and other Activities
<b>Sampling Duration</b>	: 24 Hrs.
<b>Scope of Monitoring</b>	: Regulatory Requirement
<b>Protocol Used</b>	: IS 9989 & CPCB Guidelines
<b>Parameter Required</b>	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L <sub>Max</sub>	IS 9989	55.2	50.7
2.	L <sub>Min</sub>	IS 9989	40.6	34.9
3.	L <sub>eq</sub>	IS 9989	48.93	40.13

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

### Terms & Conditions

- The results reported shall be valid only if the sample is not drawn the results apply to the sample as received.
- This test report is for information only and cannot be used in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of this certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with copy of original report.
- This test report will not be used for publicity or advertising or media purpose without prior written permission on the laboratory.
- Giving opinion does not imply acceptance of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.







# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/N/08	<b>Report No.:</b>	VEL/N/2301200013
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Reporting Date:</b>	Dated- 28.06.2022
		<b>Receipt Date:</b>	23/01/2023
		<b>Reporting Date:</b>	23/01/2023
		<b>Receipt Date:</b>	20/01/2023

**Sample Description:** Ambient Noise Level Monitoring

### General Information:-

<b>Sample Collected By</b>	: Vardan EnviroLab Representative
<b>Sampling Location</b>	: <b>Palsada</b>
<b>Instrument Used</b>	: Sound Level Meter-09
<b>Instrument Code</b>	: VEL/SLM/03
<b>Instrument Calibration Status</b>	: Calibrated
<b>Meteorological Condition During Monitoring</b>	: Clear Sky
<b>Date of Monitoring</b>	: <b>17/01/2023 to 18/01/2023</b>
<b>Time of Monitoring</b>	: 06:15 AM to 06:15AM
<b>Ambient Temperature (°C)</b>	: Min.13°C & Max. 32 °C
<b>Surrounding Activity</b>	: Human, Vehicular and other Activities
<b>Sampling Duration</b>	: 24 Hrs.
<b>Scope of Monitoring</b>	: Regulatory Requirement
<b>Protocol Used</b>	: IS 9989 & CPCB Guidelines
<b>Parameter Required</b>	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989, By Calculation	62.7	55.5
2	L <sub>Min</sub>	IS 9989, By Calculation	46.3	39.1
3	L <sub>eq</sub>	IS 9989, By Calculation	53.22	41.40

Category of Zones	Leq in dB (A)	
	Day	Night
<b>Industrial</b>	75	70
<b>Commercial</b>	65	55
<b>Residential</b>	55	45
<b>Silence Zone</b>	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

### Terms & Conditions

- The results reported herein are for the laboratory only. In every sample is not drawn the results apply to the sample as received.
- This test report is valid for legal purposes only and should be used in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of the certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with date is mentioned Report.
- This test report will not be used for publicity or advertising or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply responsibility of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/N/01	Report No.:	VEL/N/2302230001
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/02/2023
		Receipt Date:	23/02/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	:	Vardan EnviroLab Representative
Sampling Location	:	Near Site Office
Instrument Used	:	Sound Level Meter-01
Instrument Code	:	VEL/SLM/07
Instrument Calibration Status	:	Calibrated
Meteorological Condition During Monitoring	:	Clear Sky
Date of Monitoring	:	17/02/2023 to 18/02/2023
Time of Monitoring	:	06:00 AM to 06:00AM
Ambient Temperature (°C)	:	Min.15°C & Max. 35 °C
Surrounding Activity	:	Human, Vehicular and other Activities
Sampling Duration	:	24 Hrs.
Scope of Monitoring	:	Regulatory Requirement
Protocol Used	:	IS 9989 & CPCB Guidelines
Parameter Required	:	As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	$L_{Max}$	IS 9989	65.8	57.1
2	$L_{Min}$	IS 9989	42.7	37.4
3	$L_{eq}$	IS 9989	53.72	43.66

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

- Day Time is from 6.00 AM to 10.00 PM.
- Night Time is reckoned between 10.00 PM to 6.00 AM.
- 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.

### Terms & Conditions

- The results reported shall be valid only if the sample is not drawn the results apply to the sample as received.
- This test report is valid for legal purposes only and cannot be used in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of this certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with S.No. & Requested Report.
- This test report will not be used for publicity or advertising or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply acceptance of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/N/02	Report No.:	VEL/N/2302230002
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/02/2023
		Receipt Date:	23/02/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Near Main Gate
Instrument Used	: Sound Level Meter-02
Instrument Code	: VEL/SLM/03
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Clear Sky
Date of Monitoring	: 17/02/2023 to 18/02/2023
Time of Monitoring	: 06:15 AM to 06:15 AM
Ambient Temperature (°C)	: Min, 15°C & Max. 35 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989	58.3	49.6
2	L <sub>Min</sub>	IS 9989	40.8	39.1
3	L <sub>eq</sub>	IS 9989	54.66	42.31

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, Loudspeaker and bursting of crackers is banned in these zones.  
Note: Municipal Corporations of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

### Terms & Conditions:

- The results reported apply only to the sample tested. If the sample is not drawn, the results apply to the sample as received.
- This test report is valid for 12 months from the date of issue. It is not valid under any court of law without prior written approval of the laboratory.
- To confirm the authenticity of this certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with Sd/- is a certified report.
- This test report will not be used for advertising or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/N/03	Report No.:	VEL/N/2302230003
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/02/2023
		Receipt Date:	23/02/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	:	Vardan EnviroLab Representative
Sampling Location	:	Station No.3 AAQMS
Instrument Used	:	Sound Level Meter-03
Instrument Code	:	VEL/SLM/01
Instrument Calibration Status	:	Calibrated
Meteorological Condition During Monitoring	:	Clear Sky
Date of Monitoring	:	17/02/2023 to 18/02/2023
Time of Monitoring	:	06:15 AM to 06:15AM
Ambient Temperature (°C)	:	Min.15°C & Max. 35 °C
Surrounding Activity	:	Human, Vehicular and other Activities
Sampling Duration	:	24 Hrs.
Scope of Monitoring	:	Regulatory Requirement
Protocol Used	:	IS 9989 & CPCB Guidelines
Parameter Required	:	As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989	60.9	51.7
2	L <sub>Min</sub>	IS 9989	44.2	37.1
3	L <sub>eq</sub>	IS 9989	51.46	40.84

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.

### Terms & Conditions

- The results reported based on the test results of the sample is not down the results apply to the sample as received.
- This test report is for the specific test only and does not constitute any court of law without prior written approval of the laboratory.
- To confirm the authenticity of this certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of pre-processed test report. The test samples will be retained only for specific period.
- The report no. with Sully-A-Ambient Report.
- This test report will not be used for publicizing or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply ownership of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/N/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/N/2302230004  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 27/02/2023  
Receipt Date: 23/02/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village- Bade Bhandar  
Instrument Used : Sound Level Meter-04  
Instrument Code : VEL/SLM/06  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 17/02/2023 to 18/02/2023  
Time of Monitoring : 06:00 AM to 06:00 AM  
Ambient Temperature (°C) : Min. 15°C & Max. 35 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Aeq}$	IS 9989	61.3	52.6
2.	$L_{A10}$	IS 9989	47.0	36.6
3.	$L_{eq}$	IS 9989	52.79	46.75

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 category of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

### Terms & Conditions

- The results reported herein are only for the samples submitted. These results do not apply to the sample as received.
- This test report is valid only for the samples produced in accordance with the written approval of the laboratory.
- To confirm the authenticity of the certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with Suffix A is original report.
- This test report will not be used for legal or advertising or media purpose without prior written permission of the laboratory.
- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.

(Approved By)   
27/02/23  




# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/N/05	Report No.:	VEL/N/2302230005
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/02/2023
		Receipt Date:	23/02/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Near New Site Office
Instrument Used	: Sound Level Meter-05
Instrument Code	: VEL/SLM/05
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Clear Sky
Date of Monitoring	: 17/02/2023 to 18/02/2023
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.15°C & Max. 35 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Stax}$	IS 9989	59.8	51.4
2.	$L_{Stin}$	IS 9989	45.1	39.6
3.	$L_{eq}$	IS 9989	53.48	43.17

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

- Day Time is from 6.00 AM to 10.00 PM.
- Night Time is reckoned between 10.00 PM to 6.00 AM.
- 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 to be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

### Terms & Conditions

- The results reported herein are valid only if the sample is not drawn the results apply to the sample as received.
- This test report is for information purposes only and is not to be used as evidence in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of the certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- This report is with Sulfur Hexafluoride Report.
- This test report will not be used for publicity or advertising or media purpose without prior written permission of the laboratory.
- Going options does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/N/06  
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/N/2302230006  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 27/02/2023  
Receipt Date: 23/02/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village-Kathli  
Instrument Used : Sound Level Meter-06  
Instrument Code : VEL/SLM/12  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 17/02/2023 to 18/02/2023  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min, 15°C & Max. 35 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Max}$	IS 9989	63.4	54.2
2.	$L_{Min}$	IS 9989	43.8	34.6
3.	$L_{eq}$	IS 9989	51.24	45.46

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

### Terms & Conditions

- The results reported herein apply to the sample as received. The results do not apply to the sample as received.
- This test report is valid only for the purpose for which it is issued and is not valid for any other purpose without prior written approval of the laboratory.
- To confirm the authenticity of the test results, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the test results of the test report. The test samples will be retained only for specific period.
- The report no. with Suffix A-Appeal Report.
- This test report will not be used for publicity or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.

(Approved By)   
27/02/23



# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/N/07	Report No.:	VEL/N/2302230007
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/02/2023
		Receipt Date:	23/02/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	:	Vardan EnviroLab Representative
Sampling Location	:	Village- Amalibhauna
Instrument Used	:	Sound Level Meter-14
Instrument Code	:	VEL/SLM/04
Instrument Calibration Status	:	Calibrated
Meteorological Condition During Monitoring	:	Clear Sky
Date of Monitoring	:	17/02/2023 to 18/02/2023
Time of Monitoring	:	06:00 AM to 06:00AM
Ambient Temperature (°C)	:	Min.15°C & Max. 35 °C
Surrounding Activity	:	Human, Vehicular and other Activities
Sampling Duration	:	24 Hrs.
Scope of Monitoring	:	Regulatory Requirement
Protocol Used	:	IS 9989 & CPCB Guidelines
Parameter Required	:	As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Stm}$	IS 9989	57.3	52.4
2.	$L_{Min}$	IS 9989	42.2	36.7
3.	$L_{eq}$	IS 9989	49.88	41.26

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

### Terms & Conditions

- The results reported herein are only valid for the samples tested. In case sample is not drawn the results apply to the sample as received.
- This test report is valid for 3 months from the date of issue. In case of any dispute, the client shall approach the court of law without prior written approval of the laboratory.
- To confirm the authenticity of the certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopies of test report. The test samples will be retained only for specific period.
- The report is with Sulfur Hexafluoride Report.
- This test report will not be used for publicity or advertising or similar purpose without prior written permission on the laboratory.
- During operations does not imply endorsement of the firm or service by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.







# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/N/08  
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/N/2302230008  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 27/02/2023  
Receipt Date: 23/02/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Palsada  
Instrument Used : Sound Level Meter-11  
Instrument Code : VEL/SLM/03  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 17/02/2023 to 18/02/2023  
Time of Monitoring : 06:15 AM to 06:15 AM  
Ambient Temperature (°C) : Min. 15°C & Max. 35 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	$L_{Max}$	IS 9989, By Calculation	64.3	57.0
2	$L_{Min}$	IS 9989, By Calculation	47.9	38.3
3	$L_{eq}$	IS 9989, By Calculation	54.78	45.08

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.

### Terms & Conditions

- The results reported herein are for the specific sample. In case sample is not drawn the results apply to the sample as received.
- This test report is valid for 12 months from the date of issue. It is subject to law without prior written approval of the laboratory.
- To confirm the authenticity of the certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photographs test report. The test samples will be retained only for specific period.
- The report no. with Suffix X is reserved for legal purpose.
- This test report will not be used for publicity or advertising or media purpose without prior written permission in the laboratory.
- Getting opinions does not imply involvement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/N/01  
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/N/2303200008  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 24/03/2023  
Receipt Date: 20/03/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Near Site Office  
Instrument Used : Sound Level Meter-01  
Instrument Code : VEL/SLM/07  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 15/03/2023 to 16/03/2023  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.21°C & Max. 40 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L <sub>Max</sub>	IS 9989	67.1	59.2
2	L <sub>Min</sub>	IS 9989	44.5	39.8
3	L <sub>eq</sub>	IS 9989	51.26	45.21

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, 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

### Terms & Conditions

- The results reported relate only to the samples tested. In case sample is not drawn the results apply to the sample as received.
- This test report in full or part, shall not be reproduced in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of the certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the accuracy of photocopied test report. The test samples will be retained only for specific period.
- The report no. with Suffix A-Appealed/Retest
- This test report will not be used for publicity or advertising or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/N/02  
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.  
Village - Chhote Bhandar,  
Post Office- Bade Bandar, Tehsil- Passore,  
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2303200009  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 24/03/2023  
Receipt Date: 20/03/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Near Fire Building  
Instrument Used : Sound Level Meter-02  
Instrument Code : VEL/SLM/03  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Clear Sky  
Date of Monitoring : 15/03/2023 to 16/03/2023  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.21°C & Max. 40 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	$L_{Max}$	IS 9989	65.6	48.1
2	$L_{Min}$	IS 9989	41.2	37.0
3	$L_{eq}$	IS 9989	56.24	41.89

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, 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.

### Terms & Conditions

- The results reported herein only to the samples analyzed. In case sample is not drawn the results apply to the sample as received.
- This test report in full or in part shall not be admissible in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of this certificate or report, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with Suffix A-Air/amber report.
- This test report will not be used for publicity or advertising or media purpose without prior written permission of the laboratory.
- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/N/03  
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/N/2303200010  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 24/03/2023  
Receipt Date: 20/03/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village- Bade Bhandar  
Instrument Used : Sound Level Meter-04  
Instrument Code : VEL/SLM/06  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Partially Cloudy  
Date of Monitoring : 16/03/2023 to 17/03/2023  
Time of Monitoring : 06:00 AM to 06:00 AM  
Ambient Temperature (°C) : Min.22°C & Max. 38 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L <sub>Max</sub>	IS 9989	63.5	55.8
2.	L <sub>Min</sub>	IS 9989	45.2	34.1
3.	L <sub>eq</sub>	IS 9989	53.18	44.26

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

### Terms & Conditions

- The results reported apply only to the samples tested. In case sample is not drawn the results apply to the sample as received.
- This test report in its entire part, shall not be reproduced in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of the test results, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with Suffix A-Annexure Report.
- This test report will not be used for publicity or advertising or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/N/04  
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.  
Village - Chhote Bhandar,  
Post Office- Bade Bandar, Tehsil- Passore,  
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2303200011  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 24/03/2023  
Receipt Date: 20/03/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village-Chhote Bhandar  
Instrument Used : Sound Level Meter-05  
Instrument Code : VEL/SLM/05  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Partially Cloudy  
Date of Monitoring : 16/03/2023 to 17/03/2023  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.22°C & Max. 38 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Aeq}$	IS 9989	57.3	49.5
2.	$L_{Aeq}$	IS 9989	44.9	37.3
3.	$L_{eq}$	IS 9989	52.08	42.96

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.

### Terms & Conditions

- The results reported apply only to the samples tested. In case sample is not drawn the results apply to the sample as received.
- This test report in full or part, shall not be reproduced in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of the Certificate of analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with Suffix A-Attributed Error.
- This test report will not be used for publicity or advertising or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number: VEL/N/05  
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.  
Village - Chhote Bhandar,  
Post Office- Bade Bandar, Tehsil- Passore,  
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2303200012  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 24/03/2023  
Receipt Date: 20/03/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By : Vardan EnviroLab Representative  
Sampling Location : Village-Kathli  
Instrument Used : Sound Level Meter-06  
Instrument Code : VEL/SLM/12  
Instrument Calibration Status : Calibrated  
Meteorological Condition During Monitoring : Partially Cloudy  
Date of Monitoring : 16/03/2023 to 17/03/2023  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.22°C & Max. 38 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Sampling Duration : 24 Hrs.  
Scope of Monitoring : Regulatory Requirement  
Protocol Used : IS 9989 & CPCB Guidelines  
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L <sub>Max</sub>	IS 9989	61.5	53.8
2.	L <sub>Min</sub>	IS 9989	44.0	36.2
3.	L <sub>eq</sub>	IS 9989	52.66	41.76

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

### Terms & Conditions

- The results reported relate only to the samples tested. In case sample is not drawn the results apply to the sample as received.
- This test report is not to be used in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of the analysis, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with Suffix A-Amended Report.
- This test report will not be used for publicity or advertising or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply encasement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/N/06	Report No.:	VEL/N/2303200013
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	24/03/2023
		Receipt Date:	20/03/2023

Sample Description: Ambient Noise Level Monitoring

### General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Village- Amalibhauna
Instrument Used	: Sound Level Meter-14
Instrument Code	: VEL/SLM/04
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Partially Cloudy
Date of Monitoring	: 16/03/2023 to 17/03/2023
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.22°C & Max. 38 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	$L_{Max}$	IS 9989	59.6	50.9
2.	$L_{Min}$	IS 9989	43.8	38.2
3.	$L_{eq}$	IS 9989	50.72	42.56

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.

### Terms & Conditions

- The results reported herein only to the samples tested. In case sample is not drawn the results apply to the sample as received.
- This test report in its original form, shall not be reproduced in any court of law without prior written approval of the laboratory.
- To confirm the authenticity of the test results, please contact us through email at lab@vardan.co.in
- Laboratory is not responsible for the authenticity of photocopied test report. The test samples will be retained only for specific period.
- The report no. with suffix 'A' is for reference only.
- This test report will not be used for publicity or advertising or media purpose without prior written permission on the laboratory.
- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL /GW/01	Report No.:	VEL/W/2301200002
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bado Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
			Dated- 28.06.2022
Sample Description:	Ground Water	Reporting Date:	23/01/2023
Sampling Location:	Industrial Canteen	Period of Analysis:	20/01/2023 to 23/01/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	20/01/2023
Preservation:	Refrigerated	Sampling Date:	16/01/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr + 250 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)	IS 3025 (P-11)	7.46	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	195.18	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	49.86	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	160.28	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	44.76	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	17.20	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	331.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	16.34	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Report No.: VEL/W/2301200002

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 4500 FD	0.36	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.23	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.39	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.21	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	-
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/02	Report No.:	VEL/W/2301200003
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	23/01/2023
Sampling Location:	Near Site Office	Period of Analysis:	20/01/2023 to 23/01/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	20/01/2023
Preservation:	Refrigerated	Sampling Date:	16/01/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 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)	IS 3025 (P-11)	7.48	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	235.87	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	62.33	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	201.28	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	56.67	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	19.53	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	340.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	31.08	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Report No.: VEL/W/2301200003

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 4500 FD	0.30	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	1.92	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.28	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.10	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	--
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml	-	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/03	Report No.:	VEL/W/2301200004
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	23/01/2023
Sampling Location:	Village- Bade Bhandar	Period of Analysis:	20/01/2023 to 23/01/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	20/01/2023
Preservation:	Refrigerated	Sampling Date:	17/01/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 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)	IS 3025 (P-11)	7.62	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	281.22	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	76.51	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	191.02	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	70.12	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	21.95	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	417.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	12.77	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/03				Report No.: VEL/W/2301200004		
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 4500 FD	0.24	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.88	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.29	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.18	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	--
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		--

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/04	Report No.:	VEL/W/2301200005
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	23/01/2023
		Period of Analysis:	20/01/2023 to 23/01/2023
		Receipt Date:	20/01/2023
Sample Description:	Ground Water	Sampling Date:	17/01/2023
Sampling Location:	Village- Chhote Bhandar	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr.+250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.18	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	245.29	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	55.24	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	228.48	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	51.22	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	26.11	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	373.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	17.56	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL /GW/04				Report No.: VEL/W/2301200005		
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 4500 FD	0.28	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	5.68	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.14	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.12	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	--
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		--

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/05	Report No.:	VEL/W/2301200006
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	23/01/2023
		Period of Analysis:	20/01/2023 to 23/01/2023
		Receipt Date:	20/01/2023
Sample Description:	Ground Water	Sampling Date:	17/01/2023
Sampling Location:	Village- Kathli	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr + 250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.52	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	209.86	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	46.23	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	220.18	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	52.67	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	22.96	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	314.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	12.59	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/05				Report No.: VEL/W/2301200006		
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 4500 FD	0.37	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.86	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.29	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.16	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	--
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		-

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/06	Report No.:	VEL/W/2301200007
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Reporting Date:	Dated- 28.06.2022
		Period of Analysis:	23/01/2023 to 23/01/2023
Sample Description:	Ground Water	Receipt Date:	20/01/2023
Sampling Location:	Village- Amalibhauna	Sampling Date:	17/01/2023
Sample Collected by:	Vardan EnviroLab Representative	Sampling Type:	Grab
Preservation:	Refrigerated	Sample Quantity:	2.5 Ltr + 250 ml
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.33	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	173.18	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	38.92	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	138.84	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	43.69	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	18.49	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	348.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	14.79	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL /GW/06			Report No.: VEL/W/2301200007			
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 4500 FD	0.43	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.75	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.22	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.12	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml	-	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL /GW/01	Report No.:	VEL/W/2302230001
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	27/02/2023
Sampling Location:	Industrial Canteen	Period of Analysis:	23/02/2023 to 27/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	23/02/2023
Preservation:	Refrigerated	Sampling Date:	20/02/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr + 250 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)	IS 3025 (P-11)	7.36	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	188.23	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	47.12	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	162.47	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	40.18	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	17.17	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	335.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	14.56	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/01		Report No.: VEL/W/2302230001				
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 4500 FD	0.31	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.87	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.41	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.20	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/02	Report No.:	VEL/W/2302230002
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	27/02/2023
Sampling Location:	Near Site Office	Period of Analysis:	23/02/2023 to 27/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	23/02/2023
Preservation:	Refrigerated	Sampling Date:	20/02/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 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)	IS 3025 (P-11)	7.42	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	229.75	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	66.15	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	208.11	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	59.23	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	15.72	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	343.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	27.13	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/02				Report No.: VEL/W/2302230002		
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 4500 FD	0.21	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	2.11	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.23	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.15	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/03	Report No.:	VEL/W/2302230003
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Reporting Date:	Dated- 28.06.2022
		Period of Analysis:	27/02/2023
		Receipt Date:	23/02/2023 to 27/02/2023
Sample Description:	Ground Water	Sampling Date:	23/02/2023
Sampling Location:	Village- Bade Bhandar	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr.+250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.32	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	286.43	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	69.18	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	186.53	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	74.35	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	27.66	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	409.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	13.48	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Report No.: VEL/W/2302230003

Sample No.: VEL/GW/03

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 4500 FD	0.28	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.44	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.32	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.15	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	--
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		--

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL /GW/04	Report No.:	VEL/W/2302230004
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	27/02/2023
Sampling Location:	Village- Chhote Bhandar	Period of Analysis:	23/02/2023 to 27/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	23/02/2023
Preservation:	Refrigerated	Sampling Date:	20/02/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 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)	IS 3025 (P-11)	7.12	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	249.54	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	52.41	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS-3025( P-23)	221.86	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	47.33	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	28.86	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	365.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	18.25	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Report No.: VEL/W/2302230004

Limits of IS:10500 -2012

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 4500 FD	0.20	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	5.02	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.10	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.18	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	-
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



(Approved By)



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/05	Report No.:	VEL/W/2302230005
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/02/2023
		Period of Analysis:	23/02/2023 to 27/02/2023
		Receipt Date:	23/02/2023
Sample Description:	Ground Water	Sampling Date:	20/02/2023
Sampling Location:	Village- Kathli	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr + 250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.43	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	214.56	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	43.11	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	217.69	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	50.47	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	26.00	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	307.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	14.75	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/05			Report No.: VEL/W/2302230005			
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 4500 FD	0.32	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	4.12	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.31	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.19	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/06	Report No.:	VEL/W/2302230006
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	27/02/2023
Sampling Location:	Village- Amalibhauna	Period of Analysis:	23/02/2023 to 27/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	23/02/2023
Preservation:	Refrigerated	Sampling Date:	20/02/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr + 250 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)	IS 3025 (P-11)	7.23	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	163.54	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	36.22	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	131.48	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	41.56	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	17.78	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	335.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	16.92	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Report No.: VEL/W/2302230006

Limits of IS:10500 -2012

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 4500 FD	0.45	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	4.01	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.25	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.15	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	..
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml		--

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



(Approved By)

27-2-2023



27/02/23

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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/GW/03	<b>Report No.:</b>	VEL/GW/2303200019
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated- 28.06.2022</b>	
		<b>Reporting Date:</b>	24/03/2023
		<b>Period of Analysis:</b>	20/03/2023 to 24/03/2023
		<b>Receipt Date:</b>	20/03/2023
<b>Sample Description:</b>	Ground Water	<b>Sampling Date:</b>	16/03/2023
<b>Sampling Location:</b>	Village- Bade Bhandar	<b>Sampling Type:</b>	Grab
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Sample Quantity:</b>	2.5 Ltr.+250 ml
<b>Preservation:</b>	Refrigerated		
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025		

## 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)	7.24	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	291.05	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	65.87	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	172.22	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	70.18	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	30.79	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	418.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	15.02	mg/L	200	400



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## Test Report

Sample No.: VEL/GW/03					Report No.: VEL/GW/2303200019	
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 4500 FD	0.22	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.89	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.28	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ-0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.17	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL /GW/05	<b>Report No.:</b>	VEL/GW/2303200020
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
<b>Sample Description:</b>	Ground Water	<b>Reporting Date:</b>	24/03/2023
<b>Sampling Location:</b>	Village- Chhote Bhandar	<b>Period of Analysis:</b>	20/03/2023 to 24/03/2023
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Receipt Date:</b>	20/03/2023
<b>Preservation:</b>	Refrigerated	<b>Sampling Date:</b>	16/03/2023
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	<b>Sampling Type:</b>	Grab
		<b>Sample Quantity:</b>	2.5 Ltr.+250 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)	IS 3025 (P-11)	7.18	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	241.12	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	48.33	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	217.26	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	42.58	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	29.30	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	356.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	20.12	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL /GW/05					Report No.: VEL/GW/2303200020	
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 4500 FD	0.25	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	4.54	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.09	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.21	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	-
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Focal Coliform	IS 1622	<2	MPN/100ml		-

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



(Approved By)



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/GW/06	<b>Report No.:</b>	VEL/GW/2303200021
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
		<b>Dated-</b>	28.06.2022
<b>Sample Description:</b>	Ground Water	<b>Reporting Date:</b>	24/03/2023
<b>Sampling Location:</b>	Village- Kathli	<b>Period of Analysis:</b>	20/03/2023 to 24/03/2023
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Receipt Date:</b>	20/03/2023
<b>Preservation:</b>	Refrigerated	<b>Sampling Date:</b>	16/03/2023
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	<b>Sampling Type:</b>	Grab
		<b>Sample Quantity:</b>	2.5 Ltr + 250 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)	IS 3025 (P-11)	7.61	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	225.13	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	40.68	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	213.43	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	50.47	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	30.04	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	313.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	12.33	mg/L	200	400



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/GW/06					Report No.: VEL/GW/230320021	
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 4500 FD	0.36	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.92	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.26	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.20	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	--
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal Coliform	IS 1622	<2	MPN/100ml		--

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/GW/07	Report No.:	VEL/GW/2303200022
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussoore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	24/03/2023
Sampling Location:	Village- Amalibhauna	Period of Analysis:	20/03/2023 to 24/03/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	20/03/2023
Preservation:	Refrigerated	Sampling Date:	16/03/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr + 250 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)	IS 3025 (P-11)	7.16	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	169.87	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	38.92	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025(P-23)	128.54	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	48.67	mg/L	250	1000
10.	Residual Free Chlorine	IS 3025 (P-26)	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025 (P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B	17.68	mg/L	30	100
13.	Total Dissolved Solids	IS 3025 (P-16)	342.00	mg/L	500	2000
14.	Sulphate (as SO <sub>4</sub> )	APHA 4500 E	17.55	mg/L	200	400



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## Test Report

Report No.: VEL/GW/230320022

Limits of IS:10500 -2012

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 4500 FD	0.41	mg/L	1.0	1.5
16.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	5.21	mg/L	45	No Relaxation
17.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.20	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ-0.02)	mg/L	0.03	0.2
19.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	IS 3025 (P-43)	*BLQ**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	*BLQ**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	IS 3025 (P-27)	*BLQ**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.17	mg/L	5	15
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ-0.03)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	*BLQ**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	IS 3025(P-29)	*BLQ**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ 0.01)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS 15185: 2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	..
32.	E. coli	IS 15185: 2016	Absent	Per 100ml		
33.	Fecal. Coliform	IS 1622	<2	MPN/100ml	--	

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



Handwritten signature and date: 24.03.23



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/SW/01	Report No.:	VEL/SW/2301200001
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bado Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Surface Water	Party Reference No.:	5703005102
Sampling Location:	Mahanadi (Up Stream)	Reporting Date:	23/01/2023
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	20/01/2023 to 23/01/2023
Preservation:	Refrigerated	Receipt Date:	20/01/2023
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Date:	17/01/2023
		Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.25	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	118.46	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	31.23	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	84.75	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	54.00	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	9.85	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	231.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	12.59	mg/L



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/SW/01			Report No.: VEL/SW/2301200001	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.28	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.92	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.19	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	2.46	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.24	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total Coliform	IS 1622	23	MPN/100ml
31.	E.Coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<	MPN/100ml

Note: \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/SW/02	Report No.:	VEL/SW/2301200002
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.:	7.8 F-03
Sample Description:	Surface Water	Party Reference No.:	5703005102 Dated- 28.06.2022
Sampling Location:	Mahanadi (Down Stream)	Reporting Date:	23/01/2023
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	20/01/2023 to 23/01/2023
Preservation:	Refrigerated	Receipt Date:	20/01/2023
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Date:	17/01/2023
		Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.42	--
2.	Colour	IS 3025 (P-4)	3.0	Hazen
3.	Turbidity	IS 3025 (P-10)	8.0	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	140.18	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	45.62	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	108.91	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	65.01	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	6.40	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	346.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	21.33	mg/L



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/SW/02			Report No.: VEL/SW/2301200002	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.30	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	6.24	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.20	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.15	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	1.30	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.36	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total. Coliform	IS 1622	50	MPN/100ml
31.	E.coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal.Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/SW/01	Report No.:	VEL/SW/2302230001
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Surface Water	Reporting Date:	27/02/2023
Sampling Location:	Mandriver (Up Stream)	Period of Analysis:	23/02/2023 to 27/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	23/02/2023
Preservation:	Refrigerated	Sampling Date:	20/02/2023
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.16	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	112.59	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	33.26	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	81.22	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	51.20	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	7.19	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	227.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	13.55	mg/L



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/SW/01			Report No.: VEL/SW/2302230001	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.26	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	3.21	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.12	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	1.89	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.21	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total. Coliform	IS 1622	33	MPN/100ml
31.	E.Coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal.Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/SW/02	Report No.:	VEL/SW/2302230002
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.:	7.8 F-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
Sample Description:	Surface Water	Reporting Date:	27/02/2023
Sampling Location:	Mandriver (Down Stream)	Period of Analysis:	23/02/2023 to 27/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	23/02/2023
Preservation:	Refrigerated	Sampling Date:	20/02/2023
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.61	--
2.	Colour	IS 3025 (P-4)	2.0	Hazen
3.	Turbidity	IS 3025 (P-10)	7.5	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	137.42	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	47.25	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025(P-23)	112.55	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	68.23	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	4.75	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	341.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	24.56	mg/L



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/SW/02			Report No.: VEL/SW/2302230002	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.33	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	7.53	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.18	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.16	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	2.05	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.38	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total Coliform	IS 1622	60	MPN/100ml
31.	E.coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/SW/03	Report No.:	VEL/SW/2302230003
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Passore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Surface Water	Party Reference No.:	5703005102 Dated- 28.06.2022
Sampling Location:	Mahanadi (Down Stream)	Reporting Date:	27/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	23/02/2023 to 27/02/2023
Preservation:	Refrigerated	Receipt Date:	23/02/2023
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Date:	20/02/2023
		Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.13	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	135.92	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	48.66	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS:3025( P-23)	133.05	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	70.48	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	3.53	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	316.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	18.59	mg/L



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/SW/03			Report No.: VEL/SW/2302230003	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.33	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	5.02	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.21	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	2.78	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.32	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total. Coliform	IS 15185: 2016	70	MPN/100ml
31.	E.coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal.Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*L.OQ- Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/SW/04	Report No.:	VEL/SW/2302230004
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.:	7.8 F-03
Sample Description:	Surface Water	Party Reference No.:	5703005102 Dated- 28.06.2022
Sampling Location:	Mahanadi (Up Stream)	Reporting Date:	27/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	23/02/2023 to 27/02/2023
Preservation:	Refrigerated	Receipt Date:	23/02/2023
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA 23 <sup>rd</sup> Edition 2017	Sampling Date:	20/02/2023
		Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11)	7.63	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	89.12	mg/L
6.	Calcium (as Ca)	IS 3025 (P-40)	24.33	mg/L
7.	Alkalinity (as CaCO <sub>3</sub> )	IS-3025( P-23)	75.24	mg/L
8.	Chloride (as Cl)	IS 3025 (P-32)	50.77	mg/L
9.	Residual Free Chlorine	IS 3025 (P-26)	BLQ(LOQ 0.15)	mg/L
10.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.3)	mg/L
11.	Magnesium (as Mg)	APHA 3500 Mg B	6.91	mg/L
12.	Total Dissolved Solids	IS 3025 (P-16)	193.00	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	7.59	mg/L



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# Vardan EnviroLab

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

## Test Report

Sample No.: VEL/SW/04			Report No.: VEL/SW/2302230004	
S. No.	Parameter	Test-Method	Result	Unit
14.	Fluoride (as F)	APHA 4500 FD	0.19	mg/L
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	4.78	mg/L
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.23	mg/L
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
18.	Boron	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
19.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L
20.	Anionic Detergents (as MBAS)	IS 3025 (P - 68)	BLQ(LOQ 0.05)	mg/L
21.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L
22.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	2.12	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
24.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
25.	Mineral Oil	IS 3025 (P-39)	BLQ(LOQ 0.05)	mg/L
26.	Sulphide	IS 3025(P-29)	BLQ(LOQ 0.02)	mg/L
27.	Barium	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.01)	mg/L
28.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L
29.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.001)	mg/L
30.	Total. Coliform	IS 15185: 2016	50	MPN/100ml
31.	E.Coli	IS 15185: 2016	Absent	Absent/100ml
32.	Fecal.Coliform	IS 1622	<2	MPN/100ml

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ- Limit of Quantification.



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#### **4.5 Effluent Sample Analysis Report**

##### Locations

1. STP Outlet
2. ETP Outlet



# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/01	Report No.:	VEL/WW/2301190001
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Waste Water	Party Reference No.:	5703005102
Sample Location:	STP Plant (STP Outlet)	Reporting Date:	Dated- 28.06.2022 23/01/2023
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	19/01/2023 to 23/01/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Receipt Date:	19/01/2023
		Sampling Date:	16/01/2023
		Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.15	--	6.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	42.40	mg/L	250
3.	BOD (3 Days at 27 °C)	IS 3025 (P-44)	11.09	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	7.00	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.50	mg/L	10

\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/02	Report No.:	VEL/WW/2301190002
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Effluent Water	Party Reference No.:	5703005102
Sample Location:	ETP Plant (ETP Inlet)	Reporting Date:	Dated- 28.06.2022 23/01/2023
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	19/01/2023 to 23/01/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Receipt Date:	19/01/2023
		Sampling Date:	16/01/2023
		Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units
1.	pH (at 25 °C)	IS:3025 (P-11)	6.92	-
2.	COD	APHA, 5220 B Open Reflux Method	248.70	mg/L
3.	BOD (3 Days at 27°C)	IS 3025 (P-44)	63.62	mg/L
4.	Total Suspended Solids	IS: 3025 (P-17)	66.00	mg/L
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	8.20	mg/L

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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/03	Report No.:	VEL/WW/2301190003
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
			Dated- 28.06.2022
Sample Description:	Effluent Water	Reporting Date:	23/01/2023
Sample Location:	ETP Plant (ETP Outlet)	Period of Analysis:	19/01/2023 to 23/01/2023
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	19/01/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Sampling Date:	16/01/2023
		Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.32	--	5.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	56.00	mg/L	250
3.	BOD (3 Days at 27 °C)	IS 3025 (P-44)	12.06	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	8.00	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.60	mg/L	10

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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/02	Report No.:	VEL/WW/2302230002
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
			Dated- 28.06.2022
		Reporting Date:	27/02/2023
		Period of Analysis:	23/02/2023 to 27/02/2023
Sample Description:	Effluent Water	Receipt Date:	23/02/2023
Sample Location:	ETP Plant (ETP Inlet)	Sampling Date:	20/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units
1.	pH (at 25 °C)	IS:3025 (P-11)	5.72	--
2.	COD	APHA, 5220 B Open Reflux Method	241.26	mg/L
3.	BOD (3 Days at 27°C)	IS 3025 (P-44)	73.20	mg/L
4.	Total Suspended Solids	IS: 3025 (P-17)	71.00	mg/L
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	7.46	mg/L

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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/03	Report No.:	VEL/WW/2302230003
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Reporting Date:	Dated- 28.06.2022 27/02/2023
Sample Description:	Effluent Water	Period of Analysis:	23/02/2023 to 27/02/2023
Sample Location:	ETP Plant (ETP Outlet)	Receipt Date:	23/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	20/02/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	6.87	--	5.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	52.08	mg/L	250
3.	BOD (3 Days at 27 °C)	IS 3025 (P-44)	10.33	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	6.00	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.40	mg/L	10

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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/01	Report No.:	VEL/WW/2302230001
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Waste Water	Party Reference No.:	5703005102
Sample Location:	STP Plant (STP Outlet)	Reporting Date:	Dated- 28.06.2022 27/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	23/02/2023 to 27/02/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Receipt Date:	23/02/2023
		Sampling Date:	20/02/2023
		Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	8.69	--	6.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	45.21	mg/L	250
3.	BOD (3 Days at 27 °C)	IS 3025 (P-44)	10.79	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	8.00	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.40	mg/L	10

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# Vardan EnviroLab

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

## Test Report

Sample Number:  
Name & Address of the Party:

VEL/ WW/01  
M/s Raigarh Energy Generation Ltd.  
Village - Chhote Bhandar, Post Office-  
Bade Bandar, Tehsil- Pussore, Dist-  
Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/WW/2302230001  
Format No.: 7.8 F-03  
Party Reference No.: 5703005102  
Dated- 28.06.2022  
Reporting Date: 27/02/2023  
Period of Analysis: 23/02/2023 to 27/02/2023  
Receipt Date: 23/02/2023  
Sampling Date: 20/02/2023  
Sampling Quantity: 2 Ltr.  
Sampling Type: Grab  
Packing Type: Temp. Sealed

Sample Description:  
Sampling Location:  
Sample Collected By:  
Parameter Required:  
Sampling & Analysis Protocol:

Waste Water  
Boiler Blow Down  
Vardan EnviroLab Representative  
As per Work Order  
APHA 23<sup>rd</sup> Edition 2017

## TEST RESULTS

S. No.	Parameters	Protocol	Results	Unit	Prescribed Limits
1.	Total Suspended Solids	IS: 3025 (P-17)	7.35	mg/L	100.0
2.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	BLQ(LOQ 0.4)	mg/L	20.0
3.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.002)	mg/L	1.0
4.	Total Residual Chlorine	IS:3025 (P-26)	BLQ(LOQ 0.15)	mg/L	0.5
5.	Iron as Fe	VEL/STP/ICP/W-01, Issue No. - 01, Issue date 01/11/2021	0.31	mg/L	1.0

Note: \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification  
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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/ WW/02	Report No.:	VEL/WW/2302230002
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-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Reporting Date:	27/02/2023
		Period of Analysis	23/02/2023 to 27/02/2023
		Receipt Date	23/02/2023
		Sampling Date:	20/02/2023
Sample Description:	Waste Water	Sampling Quantity:	2 Ltr.
Sampling Location:	Cooling Tower Water	Sampling Type:	Grab
Sample Collected By:	Vardan EnviroLab Representative	Packing Type:	Temp. Sealed
Parameter Required:	As per Work Order		
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017		

### TEST RESULTS

S. No.	Parameters	Test Method	Result	Unit	Prescribed Limits
1.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No. - 01, Issue date 01/11/2021	0.48	mg/L	100.0
2.	Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No. - 01, Issue date 01/11/2021	0.22	mg/L	20.0
3.	Phosphate	IS:3025 (P-31)	0.52	mg/L	1.0
4.	Free Available Chlorine	IS:3025 (P-26)	0.27	mg/L	0.5

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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/05	Report No.:	VEL/WW/2302230005
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	27/02/2023
		Period of Analysis:	23/02/2023 to 27/02/2023
Sample Description:	Waste Water	Receipt Date:	23/02/2023
Sampling Location :	Ash Pond Effluent	Sampling Date:	20/02/2023
Sample Collected by:	Vardan EnviroLab Representative	Sampling Quantity:	3.0 Ltr.
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Sampling Date:	30/08/2022
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.43	--	5.5-9.0
2.	Oil & Grease	Clause No-5 of IS:3025 (P-39)	2.24	mg/L	10.0
3.	Total suspended solid (TSS)	IS: 3025 (P-17)	14.00	mg/L	100.0
4.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.08	mg/L	0.1
5.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.005)	mg/L	0.01
6.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.38	mg/L	2.0
7.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.005)	mg/L	0.2

Note :-BLQ= Below Limit of Quantification.\*\* LOQ= Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/WW/01	<b>Report No.:</b>	VEL/WW/2303170006
<b>Name &amp; Address of the Project:</b>	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
			Dated- 28.06.2022
		<b>Reporting Date:</b>	22/03/2023
		<b>Period of Analysis:</b>	17/03/2023 to 22/03/2023
<b>Sample Description:</b>	Waste Water	<b>Receipt Date:</b>	17/03/2023
<b>Sample Location:</b>	STP Plant (STP Outlet)	<b>Sampling Date:</b>	15/03/2023
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017	<b>Sample Quantity:</b>	2.0 Ltr
		<b>Parameter required:</b>	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.26	—	6.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	41.56	mg/L	250
3.	BOD (3 Days at 27 °C)	IS 3025 (P-44)	12.26	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	7.00	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.46	mg/L	10

\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/WW/02	<b>Report No.:</b>	VEL/WW/2303170007
<b>Name &amp; Address of the Project:</b>	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102
			Dated- 28.06.2022
		<b>Reporting Date:</b>	22/03/2023
		<b>Period of Analysis:</b>	17/03/2023 to 22/03/2023
<b>Sample Description:</b>	Effluent Water	<b>Receipt Date:</b>	17/03/2023
<b>Sample Location:</b>	ETP Plant (ETP Inlet)	<b>Sampling Date:</b>	15/03/2023
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> Edition 2017	<b>Sample Quantity:</b>	2.0 Ltr
		<b>Parameter required:</b>	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units
1.	pH (at 25 °C)	IS:3025 (P-11)	6.15	--
2.	COD	APHA, 5220 B Open Reflux Method	235.45	mg/L
3.	BOD (3 Days at 27°C)	IS 3025 (P-44)	70.54	mg/L
4.	Total Suspended Solids	IS: 3025 (P-17)	75.00	mg/L
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	6.40	mg/L

\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/03	Report No.:	VEL/WW/2303170008
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Effluent Water	Party Reference No.:	5703005102
Sample Location:	ETP Plant (ETP Outlet)	Reporting Date:	Dated- 28.06.2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	22/03/2023
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Receipt Date:	17/03/2023 to 22/03/2023
		Sampling Date:	17/03/2023
		Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	6.42	--	5.5-9.0
2.	COD	APHA, 5220 B Open Reflux Method	47.12	mg/L	250
3.	BOD (3 Days at 27 °C)	IS 3025 (P-44)	11.45	mg/L	30
4.	Total Suspended Solids	IS: 3025 (P-17)	7.20	mg/L	100
5.	Oil and Grease	Clause No-5 of IS:3025 (P-39)	0.41	mg/L	10

\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/04	Report No.:	VEL/WW/2303170009
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	22/03/2023
		Period of Analysis:	17/03/2023 to 22/03/2023
Sample Description:	Waste Water	Receipt Date:	17/03/2023
Sampling Location :	Near Hydrobin	Sampling Date:	15/03/2023
Sample Collected by:	Vardan EnviroLab Representative	Sampling Quantity:	3.0 Ltr.
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.34	--	5.5-9.0
2.	Oil & Grease	Clause No-5 of IS:3025 (P-39)	2.80	mg/L	10.0
3.	Total suspended solid (TSS)	IS: 3025 (P-17)	10.00	mg/L	100.0
4.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.16	mg/L	0.1
5.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.005)	mg/L	0.01
6.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.33	mg/L	2.0
7.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ(**LOQ 0.005)	mg/L	0.2

Note :-BLQ= Below Limit of Quantification, \*\* LOQ= Limit of Quantification.



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/WW/05	Report No.:	VEL/WW/23031700010
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.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	22/03/2023
		Period of Analysis:	17/03/2023 to 22/03/2023
Sample Description:	Waste Water	Receipt Date:	17/03/2023
Sampling Location :	Ash Pond Effluent	Sampling Date:	15/03/2023
Sample Collected by:	Vardan EnviroLab Representative	Sampling Quantity:	3.0 Ltr.
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017	Sampling Date:	30/08/2022
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	IS:3025 (P-11)	7.52	--	5.5-9.0
2.	Oil & Grease	Clause No-5 of IS:3025 (P-39)	2.60	mg/L	10.0
3.	Total suspended solid (TSS)	IS: 3025 (P-17)	12.00	mg/L	100.0
4.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.12	mg/L	0.1
5.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	BLQ(LOQ 0.005)	mg/L	0.01
6.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	0.35	mg/L	2.0
7.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No. -01, Issue date 01/11/2021	*BLQ**LOQ 0.005)	mg/L	0.2

Note :-BLQ= Below Limit of Quantification.\*\* LOQ= Limit of Quantification.



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#### **4.6 Stack Monitoring**

##### Locations

1. TPP



# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/S/01	<b>Report No.:</b>	VEL/S/2301160001
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office - Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5703005102 Dated- 28.06.2022
		<b>Report Date:</b>	20/01/2023
		<b>Period of Analysis:</b>	16/01/2023 to 20/01/2023
		<b>Receipt Date:</b>	16/01/2023

**Sample Description:** Stack Emission Monitoring

### General Information:-

Sample Collected By	:	VEL Representative
Date & Time of Sampling	:	12/01/2023
Location	:	Stack monitoring (Unit- 1)
Sampling Duration (Minutes)	:	36.0
Meteorological Condition	:	Clear Sky
Stack Attached To	:	TPP
Stack Diameter (m)	:	7.1
Stack Height (m)	:	268
Instrument Calibration Status	:	Calibrated
Ambient Temperature - Ta (°C)	:	22.0
Temperature of Stack Gases - Ts (°C)	:	124.0
Velocity of Stack Gases (m/sec.)	:	13.40
Flow rate of PM (LPM)	:	26.0
Flow rate of Gas(LPM)	:	2.0
Sampling Condition	:	Isokinetic
Protocol Used	:	IS: 11255 & EPA

## TEST RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	35.19	mg/Nm <sup>3</sup>	50.0
2.	Sulphur Dioxide (as SO <sub>2</sub> )	IS: 11255 (P-2)	548.35	mg/Nm <sup>3</sup>	200.0
3.	Oxides of Nitrogen (as NO <sub>2</sub> )	VEL/ENV/STP/ST/FGA/01, Issue No.- 01	217.18	mg/Nm <sup>3</sup>	450.0
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No-01, Issue Date-01/11/2021:2021	BLQ(LOQ 0.001)	mg/Nm <sup>3</sup>	0.03

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/S/01	Report No.:	VEL/S/2302230001
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	27/02/2023
		Period of Analysis:	23/02/2023 to 27/02/2023
		Receipt Date:	23/02/2023

Sample Description: Stack Emission Monitoring

### General Information:-

Sample Collected By	:	VEL Representative
Date & Time of Sampling	:	17/02/2023
Location	:	Stack monitoring (Unit- 1)
Sampling Duration (Minutes)	:	40.0
Meteorological Condition	:	Clear Sky
Stack Attached To	:	TPP
Stack Diameter (m)	:	7.1
Stack Height (m)	:	268
Instrument Calibration Status	:	Calibrated
Ambient Temperature - Ta (°C)	:	24.0
Temperature of Stack Gases - Ts (°C)	:	121.0
Velocity of Stack Gases (m/sec.)	:	13.70
Flow rate of PM (LPM)	:	25.0
Flow rate of Gas(LPM)	:	2.0
Sampling Condition	:	Isokinetic
Protocol Used	:	IS: 11255 & EPA

## TEST RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	32.79	mg/Nm <sup>3</sup>	50.0
2.	Sulphur Dioxide (as SO <sub>2</sub> )	IS: 11255 (P-2)	532.16	mg/Nm <sup>3</sup>	200.0
3.	Oxides of Nitrogen (as NO <sub>2</sub> )	VEL/ENV/STP/ST/FGA/01, Issue No.- 01	212.59	mg/Nm <sup>3</sup>	450.0
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No-01, Issue Date-01/11/2021:2021	BLQ(LOQ 0.001)	mg/Nm <sup>3</sup>	0.03

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification.  
\*\*\*End of Report\*\*\*



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# Vardan EnviroLab

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

## Test Report

Sample Number:	VEL/S/01	Report No.:	VEL/S/2303200025
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-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Report Date:	24/03/2023
		Period of Analysis:	20/03/2023 to 24/03/2023
		Receipt Date:	20/03/2023

Sample Description: Stack Emission Monitoring

<b>General Information:-</b>	
Sample Collected By	: VEL Representative
Date & Time of Sampling	: 15/03/2023
Location	: Stack monitoring (Unit- 1)
Sampling Duration (Minutes)	: 38.0
Meteorological Condition	: Clear Sky
Stack Attached To	: TPP
Stack Diameter (m)	: 7.1
Stack Height (m)	: 268
Instrument Calibration Status	: Calibrated
Ambient Temperature - Ta (°C)	: 24.0
Temperature of Stack Gases - Ts (°C)	: 118.0
Velocity of Stack Gases (m/sec.)	: 12.80
Flow rate of PM (LPM)	: 26.0
Flow rate of Gas(LPM)	: 2.0
Sampling Condition	: Isokinetic
Protocol Used	: IS: 11255 & EPA

### TEST RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	35.12	mg/Nm <sup>3</sup>	50.0
2.	Sulphur Dioxide (as SO <sub>2</sub> )	IS: 11255 (P-2)	510.26	mg/Nm <sup>3</sup>	200.0
3.	Oxides of Nitrogen (as NO <sub>x</sub> )	VEL/ENV/STP/ST/FGA/01, Issue No.- 01	205.25	mg/Nm <sup>3</sup>	450.0
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No-01, Issue Date-01/11/2021:2021	BLQ(LOQ 0.001)	mg/Nm <sup>3</sup>	0.03

Note:- \*BLQ-Below Limit of Quantification, \*\*LOQ-Limit of Quantification, \*\*\*End of Report\*\*\*



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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 <sub>2</sub> , NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , 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.



# SOCIAL AUDIT AND SOCIAL IMPACT EVALUATION OF CSR ACTIVITIES OF RAIGARH ENERGY GENERATION LIMITED

Document No: IISWBM/IRP/SA-REGL/2023/01 Dated 15/03/2023 Version: 1.1



## IISWBM

March 2023



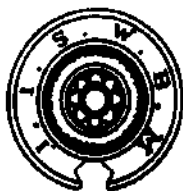
**SOCIAL AUDIT AND SOCIAL IMPACT EVALUATION  
OF CSR ACTIVITIES OF RAIGARH ENERGY  
GENERATION LIMITED**



**RAIGARH ENERGY GENERATION LIMITED**  
**Vill-Bade Bhandar, Block-Pussore**  
**Distt-Raigarh - 496100 (CG)**

**Document No. IISWBM/IRP/SA-REGL/2023/01 Dated 15/03/2023 V1.1**

*Executed by*



**Indian Institute of Social Welfare  
& Business Management**  
**(A Constituents Institute of University of Calcutta)**  
**Kolkata – 700 073**

**March, 2023**

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## FOREWORD

The Adani Group has made foray into high growth sector like Power, Infrastructure, Global Trading, Logistics, and Energy. Adani Power Limited (APL) has recently acquired 1 x 600 MW Coal-based Super Critical Thermal Power Plant of Korba West Power Company Ltd (KWPCCL), Raigarh in the State of Chhattisgarh and changed name is Raigarh Energy Generation Limited (REGL). With reference to the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India (GoI), Environmental Clearance (EC) Social Audit for the CSR Schemes shall be carried out periodically as per the CSR guidelines of Government of India. Accordingly, they engaged Indian Institute of Social Welfare and Business Management (IISWBM), Kolkata to undertake Social Audit & Social Impact Evaluation of CSR activities undertaken during last three years i.e. 2020-21 to 2022-23.

The prime aims of the present study were to evaluate the social impact of CSR activities undertaken in and around the vicinity of the REGL's TPP area for upliftment of quality of life of local people of the neighboring villages.

IISWBM was required to conduct field survey including public consultation, collect primary and secondary data on the basis of structured questionnaires to evaluate the social impact. This report presents the detail of CSR activities undertaken during the last five years and its impact on community development and improvement of quality of life of local people. The present social audit reveals that CSR Activities are being implemented with a result based approach and community is very satisfied.

The cooperation and guidance received from Shri Samir Kumar Mitra, Plant Head, REGL; Shri Arindam Rout, Head (Environment), REL; Shri Purnendu Kumar, Head (CSR) REGL and other executives & officers of REGL in conducting this study are highly acknowledged.

This study would have not been possible without the constant support and guidance of Executives of Adani Power Limited. We are grateful to acknowledge the constant guidance and support extended by Shri Santosh Singh, Head, AESG and Shri R. N. Shukla, Head, Corporate Environment Group, Adani Power Limited as well as their officers and staff.

We would also extend a warm thanks to the members of local village panchayats, anganbadi workers, village school teachers, students, parents, farmers and other beneficiaries from covered villages, all who contributed magnanimously to our study with their comments and insights.

Kolkata  
March 15, 2023



Prof. (Dr.) Krishna M Agrawal  
Project Director, IISWBM

---

## PROJECT PERSONNEL

### *TEAM MEMBERS*

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DR. SARBANI MITRA  
MS. MOUMITA SARKAR  
MR. DEBARCHAN DE  
MR. RAHUL CHAKRABORTY  
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**ANNEXURE 5.1**

Detail of CSR Activities Undertaken at REGL CSR  
Zone

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## LIST OF ABBREVIATIONS

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ABBREVIATION	DESCRIPTION
APL	: Adani Power Limited
AF	: Adani Foundation
BAIF	: Bharatiya Agro Industries Foundation
BDO	: Block Development Officer
BPL	: Below Poverty Line
CHC	: Community Health Centre
CPRs	: Common Property Resources
CSR	: Corporate Social Responsibility
EHS	: Environment, Health & Safety
ESG	: Environment, Social & Governance
FGDs	: Focus Group Discussions
GP	: Gram Panchayet
HSC	: Health Sub-Centre
ICDS	: Integrated Child Development Services
ITI	: Industrial Training Institute
Ha	: Hectare
HH	: Household
IISWBM	: Indian Institute of Social Welfare & Business Management
IMR	: Infant Mortality Rate
MoEF&CC	: Ministry of Environment, Forests & Climate Change
MMR	: Maternal Mortality Rate
MTPA	: Metric Tonne per Annum
MW	: Megawatt
NAS	: Need Assessment Survey
NFHS	: National Family Health Survey
NGOs	: Non-Governmental Organizations
O&M	: Operation & Maintenance
OBC	: Other Backward Class
PAPs	: Project Affected Persons
PAFs	: Project Affected Families
PAVs	: Project Affected Villages
PC	: Public Consultation
PHC	: Primary Health Centre
PRA	: Participatory Rural Appraisal
QoL	: Quality of Life
QoC	: Cumulative Quality of Life
R&R	: Resettlement & Rehabilitation

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**ABBREVIATION DESCRIPTION**

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RAP	: Resettlement Action Plan
REGL	: Raigarh Energy Generation Limited
RRA	: Rapid Rural Appraisal
SA	: Social Audit
SC	: Scheduled Caste
SES	: Socio-Economic Survey
SHG	: Self Help Group
SIA	: Social Impact Assessment
SIE	: Social Impact Evaluation
SPCB	: State Pollution Control Board
ST	: Scheduled Tribe
TFR	: Total Fertility Rate
TPP	: Thermal Power Plant
TSC	: Total Sanitation Campaign
TPP	: Thermal Power Plant
ULBs	: Urban Local Bodies
VDAC	: Village Development Advisory Committee
VFCs	: Value Function Curves
ZP	: Zila Parishad

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# EXECUTIVE SUMMARY

## 1.0 INTRODUCTION

The Adani Group (1988) has grown from being a trading house to a diversified business group with interests from infrastructural development to FMCGs. The Adani Group has made foray into high growth sector like Power, Infrastructure, Global Trading, Logistics and Energy.

Raigarh Energy Generation Limited (REGL) has recently acquired 1 x 600 MW Coal Based Thermal Power Plant at Raigarh in the State of Chhattisgarh. With reference to the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India (GoI), Environmental Clearance (EC) for 1x600 MW TPP Social Audit for the CSR Schemes shall be carried out periodically as per the CSR guidelines of Government of India. Accordingly, in compliance to the conditions of MoEF&CC's EC for TPP of REGL Social Audit & Social Impact Assessment Study have been carried out.

The salient features of 600 MW (1 × 600 MW) coal based super critical thermal power plant of Raigarh Energy Generation Limited (REGL), a wholly owned company of Adani Power Limited (APL) are presented in following table:

Item	Particulars
Location of the Plant	Village: Chote Bhandar, Bade Bhandar, Sarvani & Amali Bhona, Block: Pussore, District: Raigarh, State: Chhattisgarh
Net capacity	600 MW
No. of Units and configuration	1 x 600 MW
Date of Commercial Operation (COD)	2014
<b>Technology</b>	
Steam Generator	Sub critical Pressure 255 kg /cm <sup>2</sup> Temperature 571°C
Turbo Generator	Turbine -246 kg/cm <sup>2</sup> (a), 563°C, 3000 rpm Generator - 600 MW Generator Transformer - 776 MVA
Major Auxiliary System	<ul style="list-style-type: none"> <li>• Boiler &amp; Turbine Auxiliaries</li> <li>• Pre-treatment Plant</li> <li>• Compressed Air System</li> <li>• Coal and Ash Handling System</li> <li>• CW System and Raw Water System</li> </ul>

Item	Particulars
	<ul style="list-style-type: none"> <li>• Fire-fighting System</li> <li>• Air conditioning System</li> <li>• Ventilation System</li> </ul>
<b>Stack Details</b>	
No. of Stack	1
Stack Height (meter)	275 m
No. of flue	Single flue
Additional equipment	Electrostatic Precipitator
Coal	Indigenous Coal – 2.0 MTPA Transportation: Railways/Road
<b>Land</b>	
Plant Land Area	487.00 Acre
<b>Water</b>	
Cooling Technology	Natural draft cooling system
Total Water Requirement	15 MCM (withdraw 10 MCM)
Total Discharge	'Zero Discharge Norm' is being followed
<b>General Information</b>	
Manpower Requirement (Total)	Approx 150
Project Cost	Rs 3,600 crores

### Objectives of Study

The aims of the proposed social audit are to evaluate social impact of CSR activities undertaken in and around the vicinity of the REGL's TPP area for upliftment of quality of life of local people of the neighbouring villages. The prime objectives of the study includes:

- To assess the baseline status of key social parameters around the REGL's TPP site;
- To evaluate the social impact of the TPP based on the available secondary data and information generated during the study/survey;
- To present all potential significant social impacts and local employable youth for training in skills, relevant to the project;
- To undertake detailed social audit of CSR Activities undertaken by REGL in last three years.

## Scope of Study

The scope of study includes:

- 1) Social Audit & Social Impact Evaluation Survey/study.
- 2) Action plan for identification of local employable youth for training in skills, relevant to the project.
- 3) Evaluation of Socio-economic profile of the CSR villages.
- 4) Public consultation in selected Panchayat/villages to ascertain the public views on various social and local issues.
- 5) Gap analysis and comparison of last three years for local development as well as social upliftment of local society.

## Detail of REGL-CSR Zone

The REGL's Thermal Power Plant (TPP) is located at Bade Bhandar Village under Pusore Block/Tehsil of Raigarh District, Chhattisgarh. The REGL-CSR zone primarily falls under Pusour and Barmakhela Blocks of Raigarh District as well as partially under Dabhra Block of Janjgir-Champa District under Chattisgarh State. The analysis of the CSR villages reveal that out of total 127 villages, 3.15% (4 villages) are falling under core zone and 21.25% (27 villages) are under Buffer Zone-I (i.e. 5 km radius of TPP ) and remaining (i.e. 75.6%) in Buffer Zone-II (i.e. 5-10 km radius of TPP ).

## 2.0 PRINCIPLES & GUIDELINES FOR SA & SIE

Social Impact Evaluation basically means the evaluation of qualitative and quantitative impact of the Community Development Programme carried out by the organization on the community. The evaluation includes assessment of the physical changes that have taken place during an identified span of time because of the activities undertaken as well as the awareness and perception of the people for whom the activities were aimed. The impact could be short term or / and long term. It could be on the economic aspect or the socio-cultural aspect or on both the aspects. This impact would vary depending upon the efficiency and effectiveness of the CD activities carried out and the social/physical infrastructure provided to the Community.

Adani Power Limited (APL) has always been committed to the cause of social service and has repeatedly channelized a part of its resources and activities, such that it positively affects the society socially, ethically and also environmentally. The company has taken up various CSR initiatives and enhanced values in the society.



With the advent of the Companies Act, 2013 constitution of a Corporate Social Responsibility Committee of the Board and formulation of a CSR policy became a mandatory requirement. Accordingly, the company has formulated a robust CSR policy which encompasses its philosophy and guides its sustained efforts for undertaking and supporting socially useful programmes for the welfare and sustainable development of the society. The CSR policy of APL was approved by the Board of Directors on 6<sup>th</sup> August, 2014.

Social auditing is a process that enables an organisation to assess and demonstrate its social, economic, and environmental benefits and limitations. It is a way of measuring the extent to which an organisation lives up to the shared values and objectives it has committed itself to. Social auditing also provides an assessment of the impact of an organisation's non-financial objectives through systematically and regularly monitoring its performance and the views of its stakeholders. Social auditing requires the involvement of stakeholders. This may include employees, clients, volunteers, funders, contractors, suppliers and local residents interested in the organisation. Stakeholders are defined as those persons or organisations who have an interest in, or who have invested resources in, the organisation.

### 3.0 METHODS & TOOLS FOR SA & SIE

The Social Audit (SA) & Social Impact Evaluation (SIE) has been conducted using primary data as well as secondary data available with the Districts & Blocks as well as APL and REGL. Interview with the local people and discussions with community, Government officials and community based organizations of the area were an important component of the study.

The sample villages were selected representing whole CSR region of the REGL's TPP for the present study. We have used both primary and secondary data for the study. The secondary data have been collected from the various source, namely, Census of India, Health Department, Education department, office of ICDS, Statistical department of the concerned district. The primary data have been collected from the beneficiaries of different programmes, Local community, Representatives of Gram Panchayets etc. from selected villages. The overall impact of CSR activities has been assessed for the last three years i.e. 2020-21 to 2022-2023.

As discussed earlier the framework for Social Audit was evolved including Social Process Method clubbed with Activity Analysis Approach. This uses SA4P focus system that assesses an activity around 4Ps viz. Policy, People, Process, Programmes. The individual weightage against these factors shall sum up to gross assessment measurable figure on a pre framed scale. The impact assessment matrix was evolved considering following factors:

- Design Quality
- Measurable Quantitative Progress - Days/Coverage/Change in Income/Money saved /Man days etc.



- Programme Approach
- Satisfaction of Stakeholders

A kick-off meeting was organised on 9<sup>th</sup> November, 2022 to discuss the modalities for initiating the social audit and social impact evaluation study and logistic support required for the same under the guidance of Shri R. N. Shukla, Corporate Environment Group, APL and Shri Arindam, Rout, Head (Environment), REGL and Shri Purnendu Kumar, CSR Head, REGL with IISWBM team members. The field survey and data collection was undertaken between January - February, 2023. The series of public consultation meeting conducted involving Sarpanch/ Upsarpanch/ member of Gram Panchayet along with the local people to evaluate the social impact of setting up and operation of REGL's TPP along with the evaluation of social impact of CSR activities undertaken by AF-REGL during the last three years i.e. 2020-21 to 2022-23 as well as their suggestions for improving the quality of life of local people in all the core as well as buffer zone villages falling within the 10 km radius of the REGL's Thermal Power Plant.

#### 4.0 SOCIO-ECONOMIC PROFILE OF CSR ZONE

The Socio-economic profile of REGL's CSR zone have been assessed using primary as well as secondary available with the Districts & Blocks as well as APL and REGL. PRA/RRA techniques were also adopted for the purpose.

The analysis of demographic profile of villages falling within the REGL-CSR Zone reveals that total number of households i.e. 29,277 and population of i.e. 1,08,888 in CSR Zone only 764 household with population of 2800 in core zone villages. Gender wise distribution of population in CSR villages reveals that 50.38% of the population are male and remaining 49.62% are female in the REGL-CSR zone. Analysis of status of child population (0-6 years) in REGL-CSR zone reveals that 11.27% are children (0-6 years) of total population in CSR zone. The analysis further shows that the sex ratio among child population is comparatively higher i.e. 985 females per 1000 male as compared to overall sex ratio i.e. 913 females per 1000 male in CSR zone. The analysis of distribution of SC & ST population reveals that 13.5% is scheduled caste and 25.33% are scheduled tribe of total population in REGL CSR zone. Overall status of literacy in CSR zone is 76.01% .

The analysis of status of workers in villages falling under CSR zone shows that out of total working population, 62.48% are main workers and remaining 37.52% are marginal workers. It also reveals that 32.36% are cultivators, 49.75% are agricultural labours, 1.62% are engaged in household industries and remaining 16.27% of the total main workers are other workers in the CSR zone. Whereas majority (68.22%) are agricultural labours followed by cultivators (20.56%) of the total marginal workers in the CSR zone.

For assessing the existing status of basic amenities and infrastructure development viz., educational facilities, drinking water, health and sanitation facilities, road and communication



facilities, agricultural development facilities, skill development, etc., field survey was conducted in the 66 CSR villages falling under 3 Blocks, namely Pusour and Raigarh Blocks of Raigarh district and Dabhra Block of Jajgir-Champa district under Chattisgarh State.

## 5.0 DETAIL OF CSR ACTIVITIES UNDERTAKEN

Korba West Power Company Limited (KWPCCL) a 1X600 MW supercritical thermal Power plant has been acquired by Raigarh Energy Generation Limited (REGL) of Adani Power Limited (APL) in June 2019. KWPCCL had run CSR activities since from August 2008. Raigarh Energy Generation Limited-Adani Foundation (REGL-AF) a CSR arm of Adani Group, has taken over CSR activities of KWPCCL since June 2019.

As per the APL CSR policy AF-REGL has undertaken various activities for providing sustainable livelihood and strengthening community health, education and other basic amenities & infrastructural facilities at villages of CSR zone REGL. The major emphasis is being given in sustainable livelihood development and strengthening the educational facilities in terms of providing infrastructural supports at primary as well as the secondary schools of REGL CSR zone. Besides improving the infrastructural facilities at educational institutions, the study materials, scholarships, etc. were also provided. For undertaking the CSR activities at CSR zones, the emphasis were also given in improving drinking water and health, hygiene & sanitation facilities, community infrastructure, etc. for villages of CSR zone.

CSR activities commenced in the REGL CSR Zone since 2008-2009. The REGL-AF follows the philanthropic scope of activities for sustainable community development. The CSR Programme matrix with sectors vis-à-vis the stakeholders covered under them are presented in subsequent table:

Sector	Strategic Focus	Interventions	Stakeholders
EDUCATION	Quality Improvement	Mobile library, Learn to read, Read to learn, cultural programs, activity based learning with primary school children, Science learning through Lab-in-box program, Promotion of sports and games for school children, placement of community teachers in government schools.	Children- Students , College going girls, Anganwadi Children and Staff, Parents, School Staff, School Management , Village Panchayat Representatives



Sector	Strategic Focus	Interventions	Stakeholders
	Infrastructure Supplementation	School Infrastructure Improvement, Drinking Water for School, Anganwadi Improvements.	
HEALTH, HYGIENE & SANITATION	Preventive Health and Diagnostics and Hygiene & Sanitation	MHCU, Health Awareness Camps, Community Dispensaries, Organizing various activities in coordination with ICDS for service improvement at Aganwadi center- training to AWWs and helpers, updating growth monitoring chart, health education sessions, regularization of MangalDiwas, Godbharai etc., Strengthening of Mahtaripanchayat, Observed National Nutrition Week, World Breast Feeding Week, National Girl Child Day, Support (tricycles, etc) to physically challenged persons, General health camps, Fogging in CSR villages for mosquito control, Supply of Mason and helper for construction of individual household toilets.	Villagers , Children, Pregnant Women, School Children, Doctors, Mitanin, Victims of accidents, Patients, Village Panchayat Representatives
	Curative Health and Emergency Services	Extend services of OHC Ambulance in emergency for local community, Malnutrition Intervention	
SUSTAINABLE LIVELIHOODS	Alternate Livelihood & Empowerment	Formation and strengthening of SHGs, Capacity building of SHG members on Functions of SHGs, accounts and book keeping, leadership training,	Women, Unemployed Youth (men & women) , Farmers , Disabled Individuals



Sector	Strategic Focus	Interventions	Stakeholders
		<p>Training and exposure visits on income generating activities like mushroom cultivation, vegetable cultivation, poultry farming, Extension of revolving fund for income generating activities, Formation of women's cooperative society (registered under cooperative society's act) to run income generating activities, Tailoring training to women and girls, Farmers training on "SRI" and improved agricultural practices, Promotion of "SRI" method for paddy cultivation. Skill training to youths on driving training, ITI training and construction skill training,</p> <p>Breed development of cattle through artificial insemination, Training to farmers on cattle management and feeding practices, Veterinary services in villages, Organization of veterinary camps for cattle, Promotion of nutritional supplements for cattle, Demonstration for fodder development in villages, Dairy development, Linkages with CG Milk Cooperative Federation for marketing of milk.</p>	
Rural Infrastructure Development	Improving availability of basic amenities and infrastructure facilities	Deepening & renovation of Ponds in villages, Bore wells with pumps for drinking	Villagers community, School-College Students & Staff,

Sector	Strategic Focus	Interventions	Stakeholders
		water, Construction of water tanks, Construction of cement concrete roads in villages, Construction of Community centres, Construction of Sanskritik manch, Construction of class rooms, boundary wall of schools and Aganwadi Centre, Levelling of school ground, Support for construction of Temple, Construction of police transit hall, Repair of tribal hostel, Repair of solar lights of tribal hostels.	Anganwadi Children and Staff, Parents, Tribal community Village Panchayat Representatives

The prime CSR activities undertaken includes:

- ❖ Since beginning of the project, app. Rs 21.60 Cr invested under Corporate Social Responsibility, spread in 76 villages of 43 panchayats covering app. 60 thousand population of Pussore block, Raigarh district and Dabhra block of Janjgir-Champa district,
- ❖ Rs. 6.52 Cr invested for community development in 17 tribal populated villages,
- ❖ 56 PAPs were trained in ITI fitter and electrician trade and given employment as operator in the plant,
- ❖ Three cooperative societies formed to engage villagers in alternate livelihood activities namely,
  - Gram Vikas Kamgar Sahkari Samiti - 85 PAPs are engaged through this society, carrying out housekeeping and green belt development work in the plant premises,
  - Dairy Cooperative Society - group of 25 dairy farmers linked with CG state dairy society for collection and marketing of the milk, app. 200 litres of milk sold per day,
  - Mahanadi Bahudesiye Sahkari Samiti – it is a women run society for various income generating activities,

- ❖ Developing infrastructure is essential for sustaining and multiplying growth of the society. Having the need and immediate expectations of the community, various infrastructure development activities undertaken in the villages –
  - 38 ponds were excavated in 29 peripheral villages enhancing the water catchment area of the existing pond,
  - Pond deepening and beautification were done for Jaisingh talab Raigarh, Turki talab, Sarangarh and Chandan talab, Pussore,
  - 63 bore wells with pumps were installed for safe drinking water in 44 villages and 36 water tanks constructed in 30 villages,
  - App. 32 km cement concrete road constructed in 48 villages to ease movement in the villages,
  - Construction of schools boundary wall, community sheds, table chairs in the school, repair of school hostels, etc. were executed in villages,
  
- ❖ Livelihood and Skill Enhancement –
  - SHGs - 1078 women associated with 99 SHGs, formed cooperative society
  - Best Agricultural Practices – SRI, vegetable promotion, mushroom production
  - Livestock development – app. 900 farmers trained, >4000 cattle treated in 42 vet camps, breed dev. (240 Cross Breed calves born). dairy promotion (app.150 lit. milk collected and sold every day)
  - Skill development – ITI training(58nos.), Driving training(67nos.), construction skill training (20nos.), tailoring training (502), poultry farming(37nos.); Total 684 trained
  - Cooperative society (Gram Vikas) formed to engage PAPs – 93 persons engaged
  
- ❖ Education support program –
  - Remedial Classes for primary school children – community sensitization program
  - > 2500 school children from 20 Govt. Middle Schools benefitted from activity based science learning program
  - Sports and games with school children
  - Placement of community teachers in Govt. High Schools on district admin directives
  
- ❖ Community Health Care program –
  - Impacted 5163 mothers, children and adolescent girls of 78 AWCs in 50 villages
  - > 1000 Patients received treatment in health check-up camps



- Fogging – measures to control mosquito borne diseases in 4 villages
  - Financial support for critical illness to the most needy people on request
  - Extended services of Ambulance in emergencies for community
- ❖ Cultural and sports promotion –
- Sports and games promoted among local youths – organized Football, Volleyball, Kabbadi tournament
  - Community Connect – attended religious functions in the villages
  - Contributed to cultural programs organized by district administration

REGL received awards and accolades from Think India and India CSR for “Livelihood project” and “women’s empowerment”. District Administration also recognized REGL contribution towards its support to Chakradhar Samaroh and response to flood relief and activities.

The brief detail of the CSR activities undertaken during the present social audit period (2020-21 to 2022-23) is presented in subsequent sections:

REGL believes education to be the key to empowerment. And that the children have a right to quality education. For this, multi-fold activities are undertaken in the schools of peripheral villages.

- **Implementation of project Utthan:** This ambitious project supported by Adani foundation is an attempt to reduce the dropout rates, tutor priya vidyarthi (progressive learners) in schools and work together to increase staff capability. In order to improve children's basic literacy and numeracy skills, it has also mobilized the support of teachers and parents, particularly mothers. In the project area, Utthan was launched in January, 2023 with the objective of covering 5 primary schools and 3 middle schools across Bade Bhandar, Chote Bhandar, Jeviridih, Kathli, Amlibhauna and Sarwani. As on date, the project has already been initiated in a middle school in Kathli.
- **Free coaching classes:** In Pusaur block, students are given free coaching classes in order to train them perform better in different competitive exams. Currently, 35 students are enrolled in the program among which 6 students are from selected CSR villages and the rest are from nearby villages.
- **Training on self-defence:** The Kabaddi training program for girls was launched in October, 2022 in 5 schools among which 2 are from Bade Bhandar and one each from Supa, Bunga and Kathli. The program is targeted at age group of 14-17 to popularize



sports activities among women and also train them in different self defence mechanisms. The training program is conducted in a session of three months and 30 girls are trained per batch. These girls are chosen based for the training based on a selection test and are provided with proper nutrition throughout the course of training.

- **Installation of drinking water facility:** One 80 litre RO water filter has been installed in a high school of Bade Bhandar to provide save clean and safe drinking water facility.
- **Organization of school health camps:** The school health camps are being organized in 4 high schools of selected CSR villages for both boys and girls once a month.

**Sustainable Livelihood:** The following programs are conducted under the sustainable livelihood initiative:

- **Training on mushroom cultivation:** The interested self-help groups (SHGs) from the selected CSR villages are being trained in the area of mushroom cultivation as a means of sustainable livelihood. During the field visit, interaction with the SHGs took place at the meeting of Mushroom Sikhar Bhandar (monthly meeting of the SHGs who are involved in mushroom cultivation) held at the Gothan of Supa village. The discussion with the several members of the SHGs revealed the following:
  - Out of 10-12 members constituting each SHG, around 5 members are selected who show interest towards participation in the training program. All the profits earned is shared only among the participating members of the SHG. At present 15 SHGs are involved in the program.
  - Majorly two types of mushrooms are cultivated ie.a) Oyster b) Paddy Straw. The oyster can be further classified into three varieties- i) Blue oyster ii) Florida or White oyster and iii) Sajar Kaju or black oyster.
  - The cultivation of oysters starts from October end to March end after which two months is allotted to prepare for the cultivation of paddy straw that is done during the period from June-September.
  - In the initial stage, each SHG is provided with 40 kg spawns brought at the rate of Rs 100/Kg which comprises of oysters and paddy straw along with other materials such as polythene bags, chart powder, straw bundles etc.
  - The oysters are sold at the rate of Rs 120-150/Kg and for the paddy straw the rate may vary from Rs 240-350/Kg.
  - The white oyster has several medicinal uses and can be processed further to make mushroom powder and pickles. The black oyster and paddy straw have high demand in the market since they have delectable taste.



- Many of the SHGs cultivate mushrooms in a separate room in their own house. However, some face problems due to space constraint in their homes and hence have to travel long distances from one village to another to reach the common point where cultivation is done together along with other members.
  - The SHGs sell the mushrooms by approaching people door to door and spreading awareness regarding the benefits and taste of the same. The mushrooms are further sold by circulating WhatsApp status to increase the reach to customers.
  - In case of unsold mushrooms, they are reprocessed further and packaged in containers. In some scenarios, they are often taken to the nearby blocks or else any one or 2 members of the organization are given the responsibility to take the total amount of unsold mushrooms and sell them to the nearby Mandi. The profit later on is then distributed among themselves.
  - Almost all the members have shown high to very high willingness to continue in this program.
  - The women developed interest to join the training after becoming aware of the importance of mushroom industry from community mobilizer Somparabha Goswami and members of the Adani Foundation.
  - Their main motivation was to try something new apart from their regular household chores that will pave the way for them to become financially independent.
  - Most of them have mentioned the boost in their self-confidence after joining the program since they believe that they are capable to make monetary contributions in their family.
  - They are all being supported by their family members that help them to stay motivated in their work and overcome any challenges they face.
  - Mostly women prefer cultivation of paddy straw since the process is lengthy and women get adequate time to manage both household work as well as mushroom cultivation effectively.
- **Training on vegetable cultivation:** The program has been launched recently in October 2022. Currently, 8 members of 5 SHGs are involved in the program. Discussion with workers revealed the following:
    - The program is conducted at the Gothan of Supa GP by the joint support of government that has provided land to the cultivators, AF-REGL which provides assistance regarding tomato cultivation and the involved workers from different SHGs who invests on different equipments and other necessary things required for cultivation.
    - AF-REGL has provided the workers with tomatoes, facilities for drip irrigation, pipes, pesticides, threads etc.



- Currently they have planted 10,000 tomato plants and it is predicted that 8kg tomatoes can be produced from each plant.
  - It is estimated that by end of each year, the SHGs combined can earn upto 2-6 lakhs in total.
  - Earlier they were also engaged in cultivation of potatoes and onions .1.4 acre land in total is used for vegetable cultivation.
  - Income for cultivation of onions and potatoes varied from Rs. 15000-22000 per SHG for each production cycle.
  - The workers are highly motivated to continue their work and have started cultivation of different fruits as well such as watermelon, muskmelon, banana etc. and they have shown interest for further expansion.
  - Most of the women involved in the program have aim to become financially independent, expand their business with the profit and involve all other members from their respective SHGs so that production is possible on a large scale.
- **Training on skill development:** The Adani skill development center (ASDC) is located in Bade Bhandar which gives women the opportunity to get trained in the SET (Self Employed Tailor) course. Discussion with the trainees at ASDC revealed the following:
    - It is a three months course in which 30 students are enrolled to get trained as tailors.
    - AF-REGL charges Rs.500 from each trainee at the beginning to make their uniforms. No additional amount is charged as course fee.
    - For the training purpose, AF-REGL provides necessary sewing machines and materials for the initiation of training.
    - Among the trained students, few highly skilled women are selected to build a different group in the ASDC known as "Darzee."
    - Tailors in the "Darzee" are professionals who take bulk orders and are involved in making dresses, bags, mobile covers, cushion covers their monthly income varies from Rs.5k-10k. They work as a SHG and all the cloth materials are bought by them.
    - They prepared 913 flags for the initiative of "Har Ghar Teeranga" on last Independence Day. Currently, they are involved in making shirts for the workers in Adani.
    - The workers in Darzee are interested to work as a team since they require support to complete such big orders.
    - Material cost for lehenga and shirt is approximately RS.50 and 45 respectively and the stitching cost is around Rs.250. However, some workers have



mentioned that due to rise in material cost, they are finding it difficult to purchase the same at affordable rate.

- All the profit from “Darzee” is used for further expansion of business.
- Srishti Pradhan, a member of Darzee group is engaged with the work since last year. She has mentioned her biggest motivation to join the course was to become financially independent and to be able to contribute towards her family. She has received full support of her family members from the beginning for which she has been able to become such a highly skilled tailor at present.
- Interaction with several trainee revealed that while many are interested to work in a group on successful completion of training, some are interested to open their shops to work independently.
- Pragati Patel, a trainee of SET course who has completed her post-graduation in Zoology is highly ambitious and motivated. After acquiring necessary skill set, she wishes to open her own boutique and also provide training to interested candidates.

The mobile healthcare unit (MHCU) is currently operational in 15 selected CSR villages. The unit is active from Monday to Saturday in two sessions. The Services provided by MHCU includes:

- The MHCU provides initial treatment through checkups and distribution of medicines. The average number of patients in OPD varies from 50-60 per day. In case of serious cases, patients are referred to PHC in Bade Bhandar or CHC in Pusaur block.
- MHCU provides medicines for several diseases such as fever, stomach ache, cough & cold, body ache, high BP, diabetes etc.
- The unit has provision for RBS and Hb tests.
- In case of bed ridden patients, an initial enquiry is first done for verification after which healthcare services is provided in such special cases.
- The DMEAL app has been launched in testing mode since June, 2022 which is associated with data entry of patients visiting OPD per day along with related information. The driver has been given the responsibility to do the initial registration.

The MHCU has benefitted the villagers in several ways:

Bharath Mati, a resident of Sarwani village has been availing benefits of MHCU since two years. She was suffering from extreme muscle pain but after undergoing continuous treatment at MHCU, her health has improved considerably.

A villager from Sarwani earlier had to travel to Supa that is located approximately 5 Km away from his village to buy medicines. The cost of medicines amounted to 1000-1200/- but after the





mobilization of MHCU his problem has been resolved since the medicines have been made available in his village free of cost.

The following measures are suggested for further increasing the efficiency of services provided by the MHCU:

- A lab technician can be recruited to perform various tests and prepare reports
- Recruitment of a nurse to provide assistance to the doctor. At present the doctor has to do everything on his own which includes measuring blood pressure, temperature etc.
- Building a platform so that the patients can get in the van easily for check ups since the aged and physically challenged patients often find it difficult to go inside the MHCU.
- Awareness regarding MHCU needs to be spread across the villages since many are unaware of the timing or location of the MHCU to avail benefits.

The CSR budget for the year 2021-22 and 2022-23 were 102.01 and 161.31 lakhs respectively. The analysis of activity wise budget for undertaking CSR activities reveals that the maximum fund is being expended in sustainable livelihood development followed by community health and education. The budget allocated during 2021-22 for strengthening community health accounts for about 31.61% of total CSR fund followed by education facilities i.e. 21.92% and sustainable livelihood development & community infrastructure which accounted for 18.30 % and 18.13 % respectively of total CSR fund. Whereas the budget allocated during 2022-23 for strengthening community health accounts for about 30.00% of total CSR fund followed by sustainable livelihood development i.e. 28.55 % and education facilities & community infrastructure which accounted for 15.67 % and 15.57 % respectively of total CSR fund.

## 6.0 SOCIAL AUDIT OF CSR ACTIVITIES

APL has always endeavoured to be a leader in community development (CD) and corporate performance, which can be measured in terms of economic, social, and environmental impacts. Further, specifically on CD, APL is governed by the CSR policy formulated in August, 2014. APL CSR policy is primarily governed by Section 135 of the Companies Act, 2013.

The social audit of CSR activities have been undertaken for the last three years i.e. 2020-21 to 2022-23. The comprehensive profile of all CSR activities illustrate the following two types of programmes and target groups:

- i) Activities targeted to individual persons like students, physically challenged persons, women, unemployed youth, etc.; and



- ii) Activities targeted on whole community, namely, infrastructure works, support provided to resource-poor institution (school, colleges, Panchayets, etc.), entertainment, health and sanitation etc.

The AF-REGL undertook CSR activities under two heads, one being the individual beneficiary oriented programmes and other being community beneficiary oriented programmes. Under the individual beneficiary oriented schemes like providing scholarships, free education, skill development training, computer training, medical surgery, family planning, provision of tri-cycle, special shoes and hearing aids for handicapped were given. With the provision of scholarship, free education and aids for handicapped, there has been a rise in the sense of solidarity and self-dependence among the beneficiaries. Skill development training for women and girls has helped in capacitating them with skills and opened avenues for earning opportunities. Many of these women and girls have now opened up their business at home which is providing additional income to support their family besides economically empowering them. ASDC and other training has helped several beneficiaries to make self-reliant. The skill development training has made remarkable impact in terms of providing greater job opportunities especially to vulnerable group of people. The significant number of women in adjacent villages are motivated to scale up their business of mushroom cultivation, poultry farming, tailoring & garment manufacturing. The adoption of SRI technique for paddy cultivation along with livestock development and vermicomposting has increased crop yield significantly in the REGL-CSR zone. The beneficiaries of free surgery/operation support have now been able to resume their household responsibilities. The AF-REGL through promotion of female sterilization has been able to encourage small family potential benefits to local people.

Some of the benefits provided by the AF-REGL for any particular village were also availed directly or indirectly by other villagers. Deepening of pond and streams and bus shelters for passengers have proved to be useful not only for the residents of the particular village, but also for all the other villagers who access these facilities. The problems of villagers with regard to water logging and swampy filthy areas have been solved with construction of drains at various villages. With construction of school buildings/classroom and better sanitation facilities including development of playground, the expected results have been achieved to enhance the learning ambience in the educational institutions. With building up of school boundaries, safety of children in the school has enhanced. With the commencement and subsequent strengthening of health services in almost all the CSR villages, the health status of local people has improved significantly. With maintenance and renovation of schools and cleaning of drains, there has been a positive impact on the atmosphere of the villages.

The AF-REGL has done commendable work in ensuring the provision of clean potable drinking water to villagers. In several adjoining villages, Bore wells and water tanks have been installed



and being maintained by local people effectively. This has helped in solving the problem of shortage of water availability to great extent.

Besides the regular mobile health care unit services to various CSR villages, every year the AF-REGL also conducts various health camps in different villages where people from the nearby villages also come to get free medical check-up. In these camps medical check-ups and advice or consultation by specialized doctors is provided. Seasonal ailments are treated and free medicines are distributed. Patients suffering from serious ailments are either sent to REGL hospital or are referred to other hospitals. Such camps have had positive impact on the lives of the people who are now not only relieved of seasonal diseases but are also diagnosed for complicated ailments.

The live-stock development centres have been setup for improving the status of live-stock. From time to time health camps for livestock are also organized wherein villagers from the concerned villages as well as nearby villages come for free medical treatment and advice. Apart from free medical check-ups and medicines, other facilities like artificial insemination methods and vaccines are also provided. With these camps being organized from time to time, the livestock mortality rates have gone down.

Sports competitions are also conducted/sponsored by AF-REGL regularly at various villages/town. Football, Volleyball, Kabaddi, Cricket, race, high jump, short puts throw and several other games are organized. The AF-REGL bears the expenses of providing players uniforms, conveyance charges, food, etc. The winners are given medals and trophies. These tournaments have very positive impact on the local youths interested in games and sports. This not only enhances their interest in games and sports but also gives them recognition. Apart from this, AF-REGL has provided computer, chairs, tables, sittings mats and games and sports appliances for schools. All the activities conducted in the selected villages under CSR were need-based and have had positive impact on the lives of the people.

## **7.0 SOCIAL AUDIT IMPACT MATRIX**

Social Audit team applied tools to gather first hand response from the stakeholders including the implementing staff from the REGL-AF. The findings are classified in the 4 thrust areas – Rural Infrastructure Development (Improvement of availability of basic amenities); Education (Quality Improvement, Infrastructure supplementation, HR Support); Community Health and Sanitation (Preventive and Curative measures); Sustainable Livelihoods Development (Youth, Farmers, Women and Groups). In each of the segments selected sample units were considered to study the programme design, implementation approach, reception and impact among the beneficiaries. These sample units are quantitatively and qualitatively assessed as per the scheme of social audit as elaborated in earlier chapters.



The present social audit conducted for CSR activities undertaken during 2020-21 to 2022-23 on the basis of above mentioned framework. The overall summary of impact assessment matrix is presented in subsequent table:

Sl. No.	Description	Total Score	Score Obtained	% of Score
1	CSR Policy, Process & Programme	3000	2659.14	88.64
2	CSR Activities Under Rural Infrastructure Programme	1500	1379.16	91.94
3	CSR Activities Under Education Programme	1500	1376.65	91.78
4	CSR Activities Under Health and Sanitation Programme	2000	1812.2	90.61
5	CSR Activities Under Sustainable Livelihood Programme	2000	1434.99	71.75
<b>Grand Total</b>		<b>10000</b>	<b>8662.14</b>	<b>86.94</b>

CSR Activities are being implemented with a result based approach. Good indicators are being maintained. Community is satisfied. Quantitative Indicators exhibit a healthy level at 8662 of 10000 scale. Qualitative indicators meet satisfaction of the beneficiaries in the grade of 80% and above.

Since the SA point weight 8662.14 is in band 7500-10000 it is termed as – Sustainably Excellent. This indicates that the current position has the potential to improve, however it has gained basic strength to deliver. More value addition strategies need to be implied with the core approach in time to come. There is an increase of about 10 % against social audit impact score of 2019-20.

# 1.0 INTRODUCTION

## 1.1 PROLOGUE

The Adani Group (1988) has grown from being a trading house to a diversified business group with interests from infrastructural development to FMCGs. The Adani Group has made foray into high growth sector like Power, Infrastructure, Global Trading, Logistics and Energy.

Adani Power Limited (APL), a member of the Adani Group, has taken up implementation of large Thermal Power Projects at various locations in India in view of the growing needs of power requirements in the country. APL is also actively planning to implement Thermal Power Stations at various locations in India, totaling to about 20,000 MW in the coming years.

Adani Power Limited has taken over Raigarh Energy Generation Limited (REGL) erstwhile Korba West Power Company Limited (KWPC) 1 x 600 MW Thermal Power Plant, through the insolvency proceedings by Hon'ble National Company Law Tribunal, Ahmedabad Bench vide order dt. 24.06.2019. Since commissioning of the unit, the erstwhile company Korba West Company Limited, in absence of PPA, was making recurring losses and facing severe financial constraint. During this critical juncture, unfortunately there was breakdown of generator on 22.05.2017 which further thrown serious challenges, with these reasons the erstwhile company underwent through Insolvency & Bankruptcy Code 2016 for insolvency proceedings by Hon'ble National Company Law Tribunal, Ahmedabad Bench. Currently, REGL is putting best efforts towards revival of the unit.

With reference to the Ministry of Environment & Forest (MoEF), Government of India (GoI), Environmental Clearance (EC) for 1x600 MW TPP Social Audit for the CSR Schemes shall be carried out periodically as per the CSR guidelines of Government of India and Details to be submitted to MoEF besides putting it on company's website. Accordingly, in compliance to the conditions of MoEF's EC for TPP of REGL Social Audit & Social Impact Assessment Study need to be carried out.

The present study enables Raigarh Energy Generation Limited (REGL) to meet the requirement of MoEF's EC compliance besides meeting its mission of being socially responsible corporate entity with thrust on community development around its Thermal Power Plant at Bade Bhandar under Pussor Block of Raigarh District in Chhattisgarh.

## 1.2 PROJECT DETAIL

A 600 MW (1 × 600 MW) coal based super critical thermal power plant of Korba West Power Company Limited (KWPCCL) has been recently acquired by Raigarh Energy Generation Limited (REGL), a wholly owned company of Adani Power Limited (APL). The location of REGL's TPP is presented in Figure 1.1 and 1.2. The TPP is located at a distance of 21 km North of Raigarh town. The project sites (i.e. main plant as well as water intake well) are situated in the geographical coordinates between N 21°43'52.57" – 21°44'53.37" latitude, and E 83°15'55.52"–83°16'45.37" longitude and covered by the Survey of India Toposheets No. 64 O/1, 64 O/2, 64O/5 & 64 O/6. The Project site is located in the vicinity of the rivers, Mand about 3 km towards west, and Mahanadi River about 5 km towards south, on their left banks.

The brief description of the plant is presented in Table 1.1. Figure 1.3 and 1.4 presents layout and configuration of REGL's TPP. In addition to coal, LDO and HFO are used as an auxiliary liquid fuel. Light Diesel Oil (LDO) is used for cold start up and HFO is used for flame stabilization at lower load. The main plant is arranged within the three interconnected structures, the boiler, turbine building & integrated control and electrical building.

**TABLE 1.1: SALIENT FEATURES OF REGL's TPP**

Item	Particulars
Location of the Plant	Village: Chote Bhandar, Bade Bhandar, Sarvani & Amali Bhona, Block: Pussore, District: Raigarh, State: Chhattisgarh
Net capacity	600 MW
No. of Units and configuration	1 x 600 MW
Date of Commercial Operation (COD)	2013
<b>Technology</b>	
Steam Generator	Super critical Pressure 255 kg /cm <sup>2</sup> Temperature 571°C
Turbo Generator	Turbine -246 kg/cm <sup>2</sup> (a), 563°C, 3000 rpm Generator - 685 MW (Each unit) Generator Transformer - 776 MVA
Major Auxiliary System	<ul style="list-style-type: none"> <li>• Boiler &amp; Turbine Auxiliaries</li> <li>• Pre-treatment Plant</li> <li>• Compressed Air System</li> <li>• Coal and Ash Handling System</li> <li>• CW System and Raw Water System</li> </ul>

Item	Particulars
	<ul style="list-style-type: none"> <li>• Fire-fighting System</li> <li>• Air conditioning System</li> <li>• Ventilation System</li> </ul>
<b>Stack Details</b>	
No. of Stack	1
Stack Height (meter)	275
No. of flue	Single flue
Additional equipment	Electrostatic Precipitator
Coal	Indigenous Coal – 2.0 MTPA Transportation: Railways/Road
<b>Land</b>	
Plant Land Area	487.00 Acre
<b>Water</b>	
Cooling Technology	Natural draft cooling system
Total Water Requirement	15 MCM (withdraw 10 MCM)
Total Discharge	'Zero Discharge Norm' is being followed
<b>General Information</b>	
Manpower Requirement (Total)	Approx 150
Project Cost	Rs 3,600 crores

#### Advantages of Supercritical Thermal Cycle:

- The 600 MW units have super critical steam parameters to achieve higher efficiency and hence, lower cost of generation. The prime advantages of the Super-critical technology are:
  - Improvement in power plant efficiency is more than 2%.
  - Reduction in coal consumption.
  - Reduction in emission of Greenhouse gases.
  - Overall reduction in auxiliary Power Consumption,
  - Reduction in requirement of ash dike land and consumptive water.
  - Sliding pressure operation due to once through system.

- Uniform distribution of heat due to spiral wall arrangement leading to less Boiler tube failure, thereby improving system continuity and availability of the station.
- Low thermal stress in turbine.
- Less start up time of the boiler.
- Reduction in water requirement.
- The thermodynamic cycle for 600 MW units considers super-critical steam parameters. The unit comprises of boiler, steam turbine generator, condenser, condensate extraction and boiler feed system along with all other necessary equipment for single/double reheat-regenerative cycle. For purpose of the study, the MP/IP cylinders may be of single/double casing design as per manufacturers' standard. The exhaust from HP-IP turbine will further expand in the double flow LP Turbine.

<b>Steam Generator:</b>	Super critical Pressure 255 kg /cm <sup>2</sup> Temperature 571°C
<b>Turbo Generator:</b>	Turbine - 246 kg/cm <sup>2</sup> (a), 563°C, 3000 rpm Generator - 600 MW Generator Transformer - 776 MVA

- A total height of reinforced concrete chimney is 275 m having 7.4 m exit diameter.
- For air pollution control system, each steam-generating unit has been provided with electrostatic precipitators. Each precipitator has two parallel gas paths, any of which can be isolated for maintenance when required, keeping the other path in operation.

These units utilize main and hot reheat steam at a temperature of 566°C at the turbine inlet. The main steam inlet pressure is about 254 Ata and the reheat steam pressures are in the order of 40 bar.

The energy flow in the process of thermal power generation is in four stages - firstly, the chemical energy of the coal is transformed into heat energy, which is then converted into mechanical energy and finally into electric energy through generator. The main raw materials required for thermal power generation are coal, water, and air.

In the first stage, the coal moves from the coal handling plant to the coal bunker, from where it is fed into the pulverizing mills. This mill stacks, reclaims and crushes the coal into fine powder, which is then mixed with air and blow down into the boiler by a fan. In the boiler, the mixture of



coal dust and air burns like a gas and produces high temperature. The boiler walls are lined with tubes containing high quality de-mineralized water, better known as boiler water. The heat Released by the burning coal is absorbed by the boiler which in turn transfers the water into steam. The steam is then channelized through nozzles onto the turbine's blades, where it makes the turbine rotate. A generator is attached to the turbine, which produce electricity once the turbine starts to move. The electricity is then passed through a step-up transfer which increase the voltage so that it can be transmitted efficiently over the power line of the grid.

The ash is generated due to combustion of coal as residue. Ash is collected at the bottom of the furnace as bottom ash, Economizer hoppers as Eco ash, Air-preheater hoppers as APH ash, electrostatic precipitator (ESP) hoppers as Fly ash and stack hoppers as Stack ash. The quantum of ash generation would depend on the plant load factor and the quality of coal being fed.

This ash, known as bottom ash, is water quenched, and then conveyed for disposal. The rest is fly-ash, which is in form of fine powders and is taken out of the furnace to the Electrostatic Precipitators. The fly-ash trapped by the ESP is collected pneumatically operated dry ash storage silos for cement manufacturing.

As already mentioned earlier, the plant is using super-critical technology. The thermal efficiency of the power plant can be improved by using the steam at super critical condition. The improvement in overall efficiency of the plant compared to sub critical parameters is usually at least 2% if the super critical parameters are implemented. The importance of thermal efficiency of the thermodynamic cycle and the methods to improve the thermal efficiency of the cycle are also analyzed. The indirect costs such as reduction in maintenance cost, auxiliary power consumption, ash dike land and environmental benefits such as reduction in greenhouse gases; water requirements, etc. are additional to the above increase in efficiency.

### **Importance of Efficiency:**

Since the time thermal power stations have been engineered, there is a quest for efficiency improvement. One such effort in that direction is supercritical parameters (i.e.) the pressure above  $225 \text{ kg/cm}^2$  and temperature above  $374.15^\circ\text{C}$ . The supercritical parameters for Raipur 685 MW boiler are:  $259 \text{ kg/cm}^2$  of pressure and  $571^\circ\text{C}$  of temperature.

### **Methods of Increasing Ranking Cycle Efficiency:**

The steam power cycle efficiency can be improved by the following methods:

Raising supply temperature by super heating: Increasing the turbine inlet temperature of steam will raise the heat supply to the boiler more than the heat rejection.

Raising inlet pressure of steam: Increasing the pressure will mean increase in saturation temperature at which steam evaporates thus increasing the average inlet temperature ( $T_1$ ).

Efficiency can be improved by dropping the final pressure (or temperature) at which heat is rejected.

Regenerative heating: Heating the feed water pumped to the boiler by bleeding steam from turbine.

Reheat cycle: Reheating of steam in boiler after it has already expanded in high pressure (HP) turbine will avoid moisture formation in low pressure (LP) Turbine. Also, more heat content of steam before LP turbine will improve efficiency.

At most elevated condition, the steam is supercritical. Thus, if water is at a supercritical pressure and is heated the temperature will increase continuously. At a particular value, the water will flash instantaneously into steam and super heating will commence. There is no change of specific volume from the liquid to the dry steam state.

### **Supercritical Boiler:**

A Boiler operating at a pressure above critical point is called Supercritical Boiler. Supercritical Boiler has no drum and heat-absorbing surface being, in effect, one continuous tube hence called 'Once Through Supercritical Pressure Boilers'. Boiler Feed Pump pressurizes the water in boiler, sensible heat is added in feed heaters, economizer, and furnace tubes, until water attains saturation temperature and flashes instantaneously to dry saturated steam and super heating commences.

### **Steam Generator Set:**

The steam generator for super-critical unit consists of a number of parallel circuits connected by inlet & outlet headers. Pressurized water enters the circuit at one end and leaves as supercritical steam at other end. Thus, boiler is of "Once-through type". Once-through boiler may be designed in both two-pass & tower type design. Since flow is once-through furnace wall tube. Temperature tends to increase at low load. Assisted circulation mode is super imposed to overcome this problem. The volume of the evaporator system is much smaller compared to a Natural circulation boiler. Due to smaller inventory of stored water & steam, theoretical rate of response is much faster than drum unit at base load. Super heater section has been divided in convection and

radiant zones and designed so as to maintain rated steam temperature of 571°C at the outlet. The units have been completed with coal preparations and firing system, fuel oil firing system, draft plants comprising FD, ID and PA fans, electrostatic precipitators with required number of fields in series and a multi-flue 275 m high chimney.

Light Diesel Oil (Calorific value around 10,300 K Cal/Kg) is being used as start-up and stabilization fuel. As per GOI norms, space provision for FGD unit has been incorporated in the plant layout.

Due to elevated pressure and temperature, cycle efficiency improves which results in reduction of fuel consumption per unit of electricity generated, which in turn reduces CO<sub>2</sub>, NO<sub>x</sub> & SO<sub>2</sub> emission. To limit the dust load at the inlet to the chimney to a value of 50 mg/Nm<sup>3</sup>, as per the norms prescribed by the Ministry of Environment and Forest, Govt. of India, adequately sized electrostatic-precipitators have been provided.

### **Turbine Generator Set:**

The steam turbine set is with standard multi-stage, 3000 rpm, tandem compound, single/double reheat, regenerative, condensing, multi-cylinder unit with eight (8)/nine (9) uncontrolled extractions for regenerative feed water heating. The turbine has one single flow HP cylinder, one double flow IP turbine and two double flow LP casings. The LP turbine exhausts against a condenser pressure of 76 mm Hg (abs) and maximum cooling water temperature of 33°C. The unit has horizontally split double flow LP cylinder with the LP turbine exhausting steam directly into spring mounted surface type, two-pass condenser having divided water box. The turbo-generator sets are designed for a maximum throttle steam flow at turbine valve wide open (VWO) condition of 105% of turbine MCR flow. A quick acting "HP and LP Turbine Bypass Station" has been provided as a part of turbine package. The unit is equipped with all auxiliaries as per good engineering practice. The steam turbine is directly coupled to the horizontally mounted, three phases, two-pole, cylindrical rotor type electric generator terminal after meeting power requirement for excitation system. The generator is of 0.85 – plant load factor and thus the MVA rating works out to be about 776 MVA. The generators deliver power at the standard voltage of the manufacturer between 20-24 KV, 3 Phase, 50 Hz. The steam turbine is equipped with hydraulic/motorized turning gear for uniform heating/ cooling of the rotor during start up/shut down. Highly sensitive electronic-hydraulic governing system is provided with suitable hardware to ensure fast speed to operation & safety. The units are complete with twin flow, double-pass, horizontal, surface type, water cooled condensers, 2 x 100% vacuum pumps (1W + 1S), vertical/horizontal shell and tube type high pressure feed water heaters with group bypass arrangement, 4-stage horizontal U-tube low pressure heaters, drain cooler, gland steam condenser, horizontal spray or spray-cum-tray type deaerator with integral vent condenser etc. The units are equipped with two (2) nos. 50% capacity turbine driven and one (1) 30% capacity motor driven centrifugal, horizontal, boiler feed pumps of barrel casing construction.



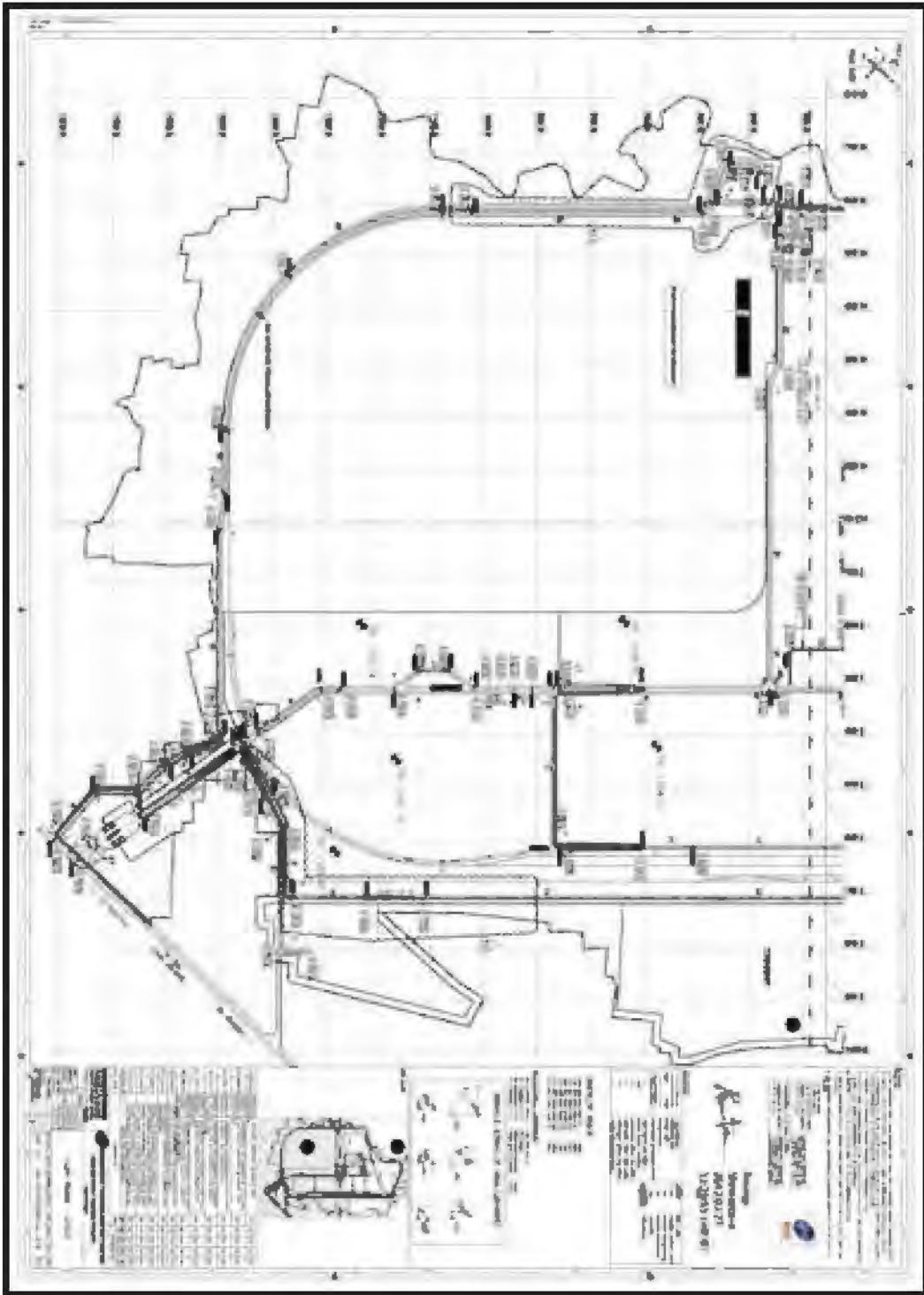
**FIGURE 1.2: SATELLITE IMAGERY OF LOCATION OF REGL'S TPP SITE**



**FIGURE 1.3: LAYOUT MAP OF REGL's TPP**



FIGURE 1.4: LAYOUT PLAN OF REGL's TPP



### 1.3 OBJECTIVES OF THE STUDY

The aims of the proposed social audit are to evaluate social impact of CSR activities undertaken in and around the vicinity of the REGL's TPP area for upliftment of quality of life of local people of the neighbouring villages. The prime objectives of the study includes:

- To assess the baseline status of key social parameters around the REGL's TPP site;
- To evaluate the social impact of the TPP based on the available secondary data and information generated during the study/survey;
- To present all potential significant social impacts and local employable youth for training in skills, relevant to the project;
- To undertake detailed social audit of CSR Activities undertaken by REGL in last three years.

### 1.4 SCOPE OF THE STUDY

The scope of the study includes the undertaking of a reconnaissance Social Audit & Social Impact Evaluation of CSR activities undertaken by REGL. On the basis of the survey, a framework for assessing social development in all the villages coming within 10 km radius of the project site would be evolved. The study shall be in line with National Legislation and in compliance with EC Conditions of MoEF & CC.

The scope of work includes:

- 1) Social Audit & Social Impact Evaluation Survey/study.
- 2) Action plan for identification of local employable youth for training in skills, relevant to the project.
- 3) Socio-economic profile of the villages and economic development profile of the villages.
- 4) Public consultation in all Panchayat/villages to ascertain the public views on various social and local issues.
- 5) Community engagement and social development plan.
- 6) Social Audit of 10 km radius and action plan for implementation.



- 7) Gap analysis and comparison of last three years for local development as well as social upliftment of local society.
- 8) Advantages of conducting Social Audit /Social Impact Evaluation.

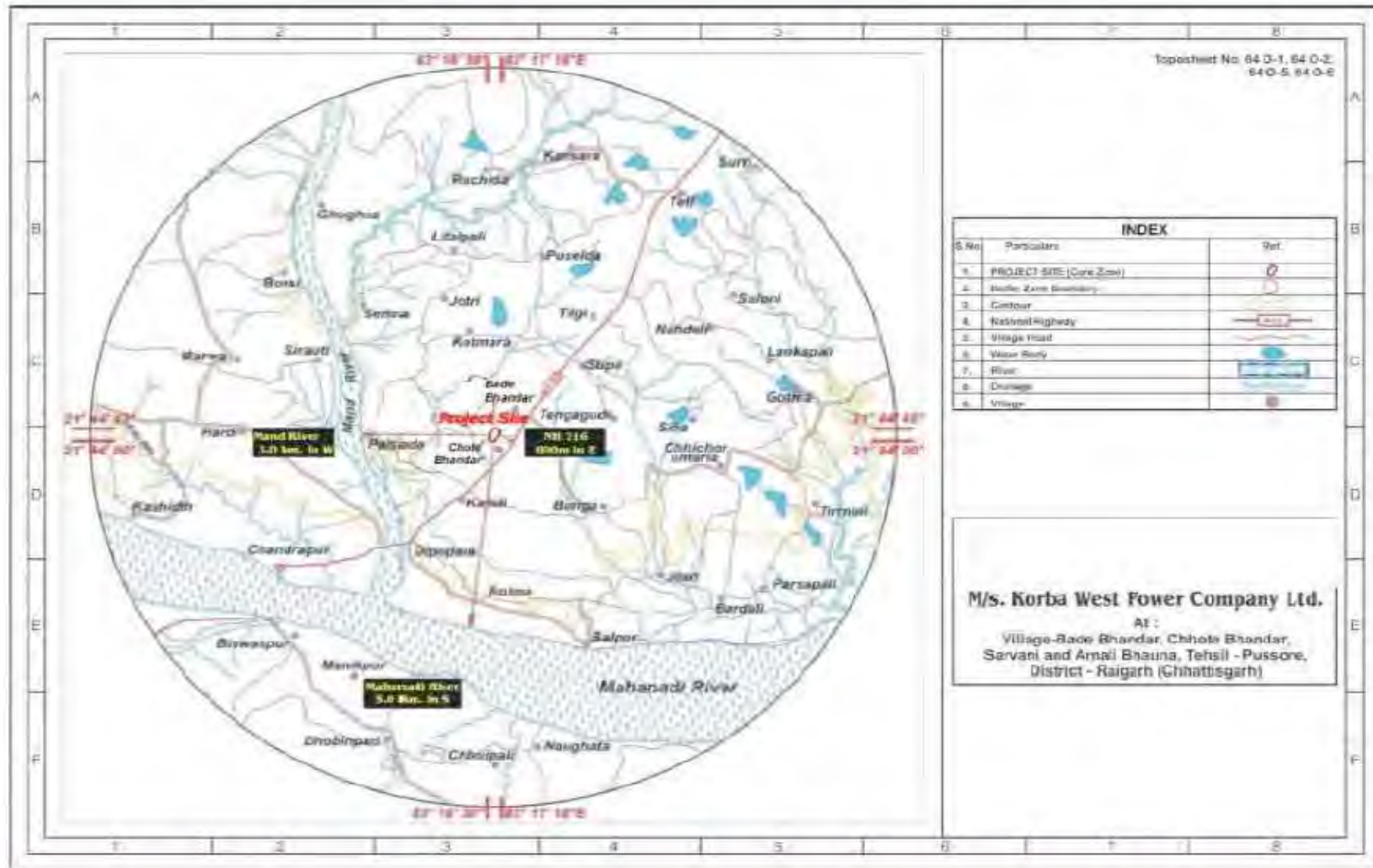
## 1.5 DETAIL OF REGL-CSR ZONE

The REGL-CSR zone has been identified within 10 km radius considering the boundary of TPP. The identified CSR zone has been divided into three sub-zones i.e., Core Zone (CZ), Buffer Zone-I (BZ-I) and Buffer Zone-II (BZ-II). Core Zone includes the villages which are affected directly due to land acquisition for TPP. The Buffer Zone-I includes the villages falling within 5 km radius from boundary of TPP. The Buffer Zone-II includes villages falling within 5-10 km radius of TPP. The location of CSR villages of TPP is presented in Figure 1.5 and 1.6.

FIGURE 1.5: LOCATION OF CSR ZONE OF RAIGARH ENERGY GENERATION LIMITED



FIGURE 1.6: LOCATION OF CSR VILLAGES OF REGL

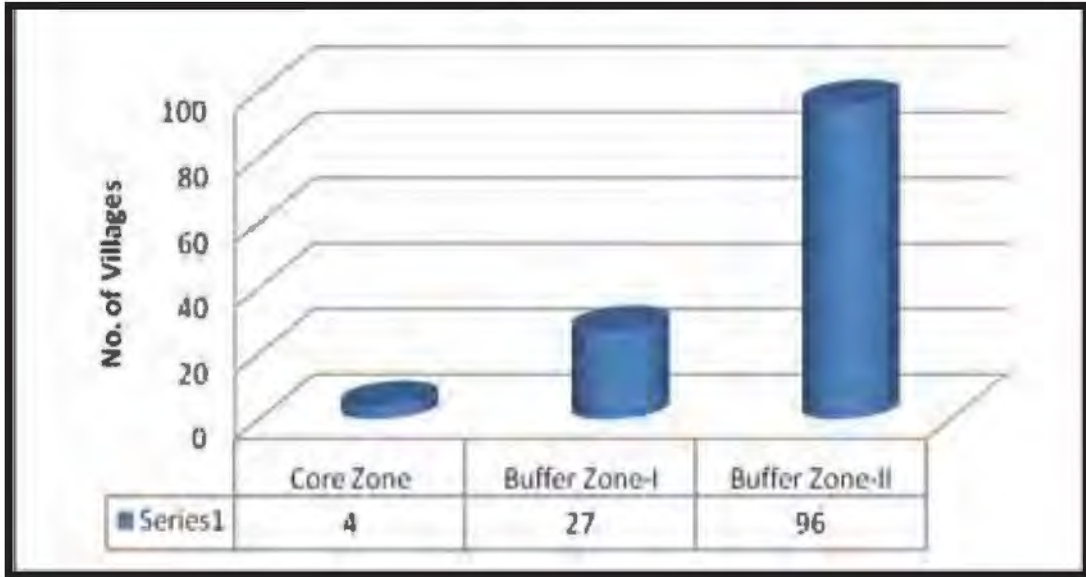


The REGL-CSR zone primarily falls under Pusour and Barmakhela Blocks of Raigarh District as well as partially under Dabhra Block of Janjgir-Champa District under Chattisgarh State. The geographical distribution of villages falling within 10 km radius of TPP i.e. CSR zone is presented in Table 1.2. The analysis reveals that out of total 127 villages falling within REGL-CSR zone, 126 are inhabited and only one is un-inhabited villages. The zone wise distribution of CSR villages is presented in Figure 1.7. The analysis of district wise distribution of villages reveals that out of total 127 villages falling within CSR zone 73.23% villages fall under Raigarh District and remaining 26.77% villages fall under Jangir-Champa District of Chattisgarh State (Figure 1.8). Similarly the analysis of block wise distribution of villages falling under REGL zone reveals that 54.33% villages fall under Pusour Block, 14.96% villages falls under Barmakela Block and 3.93% villages under Raigarh Block of Raigarh District and remaining 26.77% villages fall under Dabhra Block of Jangir-Champa District (Figure 1.9). The list of CSR villages is presented in Annexure 1.1.

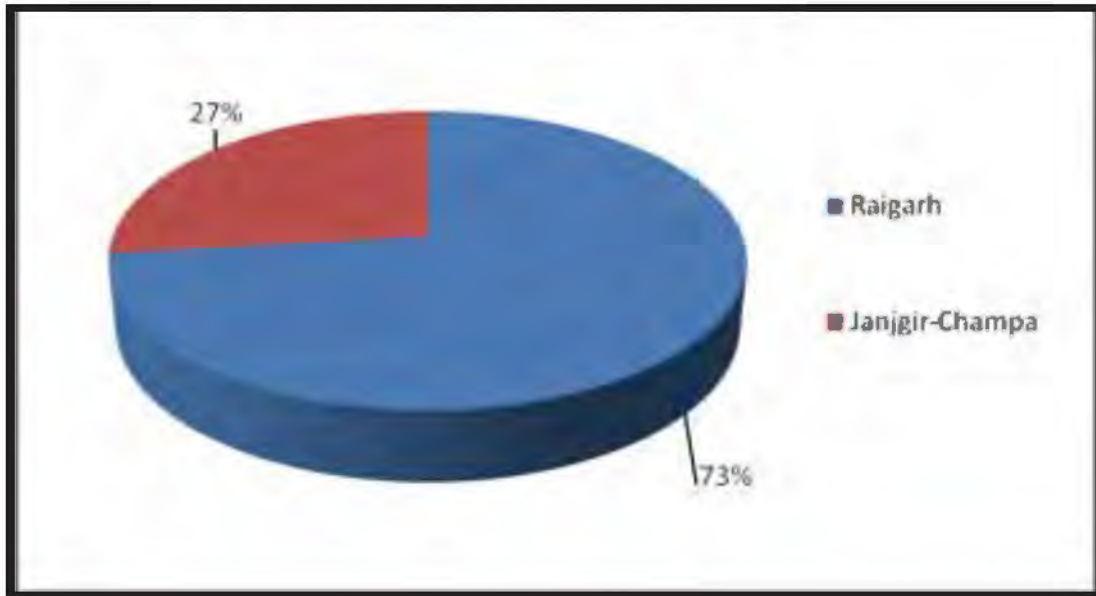
**TABLE 1.2: GEOGRAPHICAL DISTRIBUTION OF VILLAGES IN REGL-CSR ZONE**

Block	District	State	No. of Villages		
			Inhabited Villages	Un-inhabited Villages	Total
<b>Core Zone</b>					
Pusour	Raigarh	Chattisgarh	4	-	4
<b>Sub-Total</b>			4	-	4
<b>Buffer Zone-I</b>					
Pusour	Raigarh	Chattisgarh	21	-	21
Dabhra	Janjgir-Champa	Chattisgarh	6	-	6
<b>Sub-Total</b>			27	-	27
<b>Buffer Zone-II</b>					
Pusour	Raigarh	Chattisgarh	44	-	44
Barmakhela	Raigarh	Chattisgarh	18	1	19
Raigarh	Raigarh	Chattisgarh	5	-	5
Dabhra	Janjgir-Champa	Chattisgarh	28	-	28
<b>Sub-Total</b>			95	1	96
<b>Grand Total</b>			126	1	127

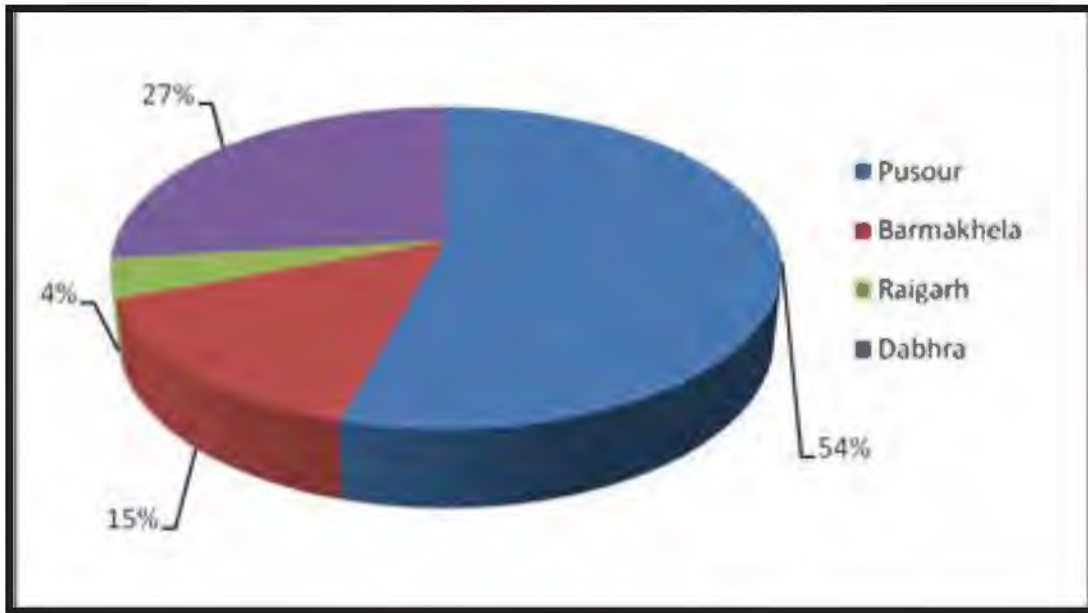
**Fig 1.7: ZONE-WISE DISTRIBUTION OF CSR VILLAGES OF REGL**



**Fig 1.8: DISTRICT-WISE DISTRIBUTION OF CSR VILLAGES OF REGL**



**Fig 1.9: BLOCK-WISE DISTRIBUTION OF CSR VILLAGES OF REGL**



## 2.0 PRINCIPLES AND GUIDELINES FOR SA & SIE

### 2.1 CORPORATE SOCIAL RESPONSIBILITY (CSR)

#### 2.1.1 Concept of CSR

Corporate Social Responsibility (CSR) also called corporate responsibility, corporate citizenship, responsible business and corporate social opportunity is a concept whereby organizations consider the interests of society by taking responsibility for the impact of their activities on customers, suppliers, employees, shareholders, communities and other stakeholders, as well as the environment. This obligation is seen to extend beyond the statutory obligation to comply with legislation and sees organizations voluntarily taking further steps to improve the quality of life for employees and their families as well as for the local community and society at large. The practice of CSR is subject to much debate and criticism. Proponents argue that there is a strong business case for CSR, in that corporations benefit in multiple ways by operating with a perspective broader and longer than their own immediate, short-term profits. Critics argue that CSR distracts from the fundamental economic role of businesses; others argue that it is nothing more than superficial window-dressing; still others argue that it is an attempt to pre-empt the role of governments as a watchdog over powerful multinational corporations.

#### CSR in Global Context

While there may be no single universally accepted definition of CSR, each definition that currently exists underpins the impact that businesses have on society at large and the societal expectations of them. Although the roots of CSR lie in philanthropic activities (such as donations, charity, relief work, etc.) of corporations, globally, the concept of CSR has evolved and now encompasses all related concepts such as triple bottom line, corporate citizenship, philanthropy, strategic philanthropy, shared value, corporate sustainability and business responsibility. This is evident in some of the definitions presented below:

The European Commission defines CSR as “the responsibility of enterprises for their impacts on society”. To completely meet their social responsibility, enterprises “should have in place a process to integrate social, environmental, ethical human rights and consumer concerns into their business operations and core strategy in close collaboration with their stakeholders”.

The World Business Council for Sustainable Development (WBCSD) defines CSR as “the continuing commitment by business to contribute to economic development while improving the quality of life of the workforce and their families as well as of the community and society at large.”



According to the United Nations International Development Organization (UNIDO), “Corporate social responsibility is a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders. CSR is generally understood as being the way through which a company achieves a balance of economic, environmental and social imperatives (Triple-Bottom-Line Approach), while at the same time addressing the expectations of shareholders and stakeholders. In this sense it is important to draw a distinction between CSR, which can be a strategic business management concept, and charity, sponsorships or philanthropy. Even though the latter can also make a valuable contribution to poverty reduction, will directly enhance the reputation of a company and strengthen its brand, the concept of CSR clearly goes beyond that.”

From the above definitions, it is clear that:

- The CSR approach is holistic and integrated with the core business strategy for addressing social and environmental impacts of businesses.
- CSR needs to address the well-being of all stakeholders and not just the company's shareholders.
- Philanthropic activities are only a part of CSR, which otherwise constitutes a much larger set of activities entailing strategic business benefits.

### **CSR in Indian Context**

CSR in India has traditionally been seen as a philanthropic activity. And in keeping with the Indian tradition, it was an activity that was performed but not deliberated. As a result, there is limited documentation on specific activities related to this concept. However, what was clearly evident that much of this had a national character encapsulated within it, whether it was endowing institutions to actively participating in India's freedom movement, and embedded in the idea of trusteeship.

As some observers have pointed out, the practice of CSR in India still remains within the philanthropic space, but has moved from institutional building (educational, research and cultural) to community development through various projects. Also, with global influences and with communities becoming more active and demanding, there appears to be a discernible trend, that while CSR remains largely restricted to community development, it is getting more strategic in nature (that is, getting linked with business) than philanthropic, and a large number of companies are reporting the activities they are undertaking in this space in their official websites, annual reports, sustainability reports and even publishing CSR reports.





The Companies Act, 2013 has introduced the idea of CSR to the forefront and through its disclose-or-explain mandate, is promoting greater transparency and disclosure. Schedule VII of the Act, which lists out the CSR activities, suggests communities to be the focal point. On the other hand, by discussing a company's relationship to its stakeholders and integrating CSR into its core operations, the draft rules suggest that CSR needs to go beyond communities and beyond the concept of philanthropy. It will be interesting to observe the ways in which this will translate into action at the ground level, and how the understanding of CSR is set to undergo a change.

### 2.1.2 CSR and Sustainability

Sustainability (corporate sustainability) is derived from the concept of sustainable development which is defined by the Brundtland Commission as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Corporate sustainability essentially refers to the role that companies can play in meeting the agenda of sustainable development and entails a balanced approach to economic progress, social progress and environmental stewardship.

CSR in India tends to focus on what is done with profits after they are made. On the other hand, sustainability is about factoring the social and environmental impacts of conducting business, that is, how profits are made. Hence, much of the Indian practice of CSR is an important component of sustainability or responsible business, which is a larger idea, a fact that is evident from various sustainability frameworks. An interesting case in point is the NVGs for social, environmental and economic responsibilities of business issued by the Ministry of Corporate Affairs in June 2011. Principle eight relating to inclusive development encompasses most of the aspects covered by the CSR clause of the Companies Act, 2013. However, the remaining eight principles relate to other aspects of the business. The UN Global Compact, a widely used sustainability framework has 10 principles covering social, environmental, human rights and governance issues, and what is described as CSR is implicit rather than explicit in these principles.

Globally, the notion of CSR and sustainability seems to be converging, as is evident from the various definitions of CSR put forth by global organisations. The genesis of this convergence can be observed from the preamble to the recently released draft rules relating to the CSR clause within the Companies Act, 2013 which talks about stakeholders and integrating it with the social, environmental and economic objectives, all of which constitute the idea of a triple bottom line approach. It is also acknowledged in the Guidelines on Corporate Social Responsibility and Sustainability for Central Public Sector Enterprises issued by the Department of Public Enterprises (DPE), Ministry of Heavy Industries & Public Enterprises in April 2013. The new guidelines, which have replaced two existing separate guidelines on CSR and sustainable development, issued in 2010 and 2011 respectively, mentions the following:



“Since corporate social responsibility and sustainability are so closely entwined, it can be said that corporate social responsibility and sustainability is a company’s commitment to its stakeholders to conduct business in an economically, socially and environmentally sustainable manner that is transparent and ethical.”

### 2.1.3 Functional Elements of CSR

Milton Friedman, Nobel Laureate in Economics and author of several books wrote in 1970 in the New York Times Magazine that "the social responsibility of business is to increase its profits" and "the business of business is business". This represented an extreme view that the only social responsibility a law-abiding business has is to maximize profits for the shareholders, which were considered the only stakeholders for the company. However, time has given the term 'stakeholder' wider connotations. Edward Freeman defines, 'a stakeholder in an organization is any group or individual who can affect or is affected by the achievement of the organization's objectives.' Thus, the term stakeholder includes (apart from shareholders), but not limited to, customers, employees, suppliers, community, environment and society at large.

These and a host of other such ideas have given rise to the concept of Corporate Social Responsibility (CSR). The concept of CSR goes beyond charity or philanthropy and requires the company to act beyond its legal obligations and to integrate social, environmental and ethical concerns into its business process. Business for Social Responsibility defines CSR as "achieving commercial success in ways that honour ethical values and respect people, communities, and the environment. It means addressing the legal, ethical, commercial and other expectations that society has for business and making decisions that fairly balance the claims of all key stakeholders. In its simplest terms it is: "what you do, how you do it, and when and what you say." A widely quoted definition by the World Business Council for Sustainable Development states that "Corporate social responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large".

Though, there is no universal definition of CSR but the common understanding amongst most of these definitions concern with how the profits are made and how they are used, keeping in mind the interests of all stakeholders. The concept of Corporate Social Responsibility is constantly evolving. The emerging concept of CSR goes beyond charity and requires the company to act beyond its legal obligations and to integrate social, environmental and ethical concerns into company's business process. What is generally understood by CSR is that the business has a responsibility - towards its stakeholders and society at large - that extends beyond its legal and enforceable obligations. The triple bottom line approach to CSR emphasizes a company's commitment to operating in an economically, socially and environmentally sustainable manner. The emerging concept of CSR advocates moving away from a 'shareholder alone' focus to a 'multi-stakeholder' focus. This would include investors, employees, business partners, customers,



regulators, supply chain, local communities, the environment and society at large. The key components of CSR would therefore include the following:

**Corporate Governance:** Within the ambit of corporate governance, major issues are the accountability, transparency and conduct in conformity with the laws. Good corporate governance policy would enable the company to realize its corporate objectives, protect shareholder rights, meet legal requirements and create transparency for all stakeholders.

**Business Ethics:** relates to value-based and ethical business practices. 'Business ethics defines how a company integrates core values - such as honesty, trust, respect, and fairness – into its policies, practices, and decision making. Business ethics also involves a company's compliance with legal standards and adherence to internal rules and regulations.

**Workplace & Labour Relations:** Human resources are most important and critical to a company. Good CSR practices relating to workplace and labour relations can help in improving the workplace in terms of health and safety, employee relations as well as result in a healthy balance between work and non-work aspects of employees' life. It can also make it easier to recruit employees and make them stay longer, thereby reducing the costs and disruption of recruitment and retraining.

**Affirmative Action/Good Practices:** Equal opportunity employer, diversity of workforce that includes people with disability, people from the local community etc., gender policy, code of conduct/guidelines on prevention of sexual harassment at workplace, prevention of HIV/AIDS at workplace, employee volunteering etc. are some of the good practices which reflect CSR practices of the company.

**Supply Chain:** The business process of the company is not just limited to the operations internal to the company but to the entire supply chain involved in goods and services. If anyone from the supply chain neglects social, environmental, human rights or other aspects, it may reflect badly on the company and may ultimately affect business heavily. Thus, company should use its strategic position to influence the entire supply chain to positively impact the stakeholders.

**Customers:** The products and services of a company are ultimately aimed at the customers. The cost and quality of products may be of greatest concern to the customers but these are not the only aspects that the customers are concerned with. With increased awareness and means of communication, customer satisfaction and loyalty would depend on how the company has produced the goods and services, considering the social, environmental, supply-chain and other such aspects.

**Environment:** Merely meeting legal requirements in itself does not comprise CSR but it requires company to engage in such a way that goes beyond mandatory requirements and delivers environmental benefits. It would include, but not limited to, finding sustainable solutions for



natural resources, reducing adverse impacts on environment, reducing environment-risky pollutants/emissions as well as producing environment-friendly goods.

**Community:** A major stakeholder to the business is the community in which the company operates. The involvement of a company with the community would depend upon its direct interaction with the community and assessment of issues/risks faced by those living in the company surrounding areas. This helps in delivering a community-focused CSR strategy - making positive changes to the lives of the people and improving the brand-image of the company. Involvement with the community could be both direct & indirect - through funding and other support for community projects implemented by local agencies.

#### 2.1.4 Benefits of a CSR Programme

As the business environment gets increasingly complex and stakeholders become vocal about their expectations, good CSR practices can only bring in greater benefits, some of which are as follows:

- **Communities provide the licence to operate:** Apart from internal drivers such as values and ethos, some of the key stakeholders that influence corporate behaviour include governments (through laws and regulations), investors and customers. In India, a fourth and increasingly important stakeholder is the community, and many companies have started realizing that the 'licence to operate' is no longer given by governments alone, but communities that are impacted by a company's business operations. Thus, a robust CSR programme that meets the aspirations of these communities not only provides them with the licence to operate, but also to maintain the licence, thereby precluding the 'trust deficit'.
- **Attracting and retaining employees:** Several human resource studies have linked a company's ability to attract, retain and motivate employees with their CSR commitments. Interventions that encourage and enable employees to participate are shown to increase employee morale and a sense of belonging to the company.
- **Communities as suppliers:** There are certain innovative CSR initiatives emerging, wherein companies have invested in enhancing community livelihood by incorporating them into their supply chain. This has benefitted communities and increased their income levels, while providing these companies with an additional and secure supply chain.
- **Enhancing corporate reputation:** The traditional benefit of generating goodwill, creating a positive image and branding benefits continue to exist for companies that operate effective CSR programmes. This allows companies to position themselves as responsible corporate citizens.

### 2.1.5 Principles and Guidelines of CSR

National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business rolled-out by the Ministry of Corporate Affairs in India, were developed through an extensive consultative process with the objective of providing a distinctive India-centric approach for Indian businesses to understand the nuances of responsible business, applicable to large and small businesses alike. They are easy to comprehend and implement and encourage businesses to adopt the triple bottom line approach. These guidelines consist of nine principles which relate to ethics and transparency, product life cycle sustainability, employee well-being, stakeholder engagement, human rights, environmental stewardship, responsible policy advocacy, inclusive development and consumer well-being. Each principle consists of core elements that further articulate the purpose and sense of each principle. It also provides an approach for adopting these guidelines.

In India, the concept of CSR is governed by Section 135 of the Companies Act, 2013, which was passed by both Houses of the Parliament, and had received the assent of the President of India on 29 August 2013. The CSR provisions within the Act is applicable to companies with an annual turnover of 1,000 crore INR and more, or a net worth of 500 crore INR and more, or a net profit of five crore INR and more. The new rules, which are applicable from the fiscal year 2014-15 onwards, also require companies to set-up a CSR Committee consisting of their board members, including at least one independent director.

The Act encourages companies to spend at least 2% of their average net profit in the previous three years on CSR activities. The ministry's rules, that have been put up for public comment, define net profit as the profit before tax as per the books of accounts, excluding profits arising from branches outside India.

The Act lists out a set of activities eligible under CSR (Figure 2.1). Companies may implement these activities taking into account the local conditions after seeking board's approval. The indicative activities which can be undertaken by a company under CSR have been specified under Schedule VII of the Act.

The Companies (Corporate Social Responsibility Policy) Rules, 2014 provide a number of clarifications, some the highlights are as follows:

- Surplus arising out of CSR activities will have to be reinvested into CSR initiatives, and this will be over and above the 2% figure.
- The company can implement its CSR activities through the following methods:
  - Directly on its own
  - Through its own non-profit foundation set-up so as to facilitate this initiative



### 2.1.6 CSR Policy of APL

Adani Power Limited (APL) has always been committed to the cause of social service and has repeatedly channelized a part of its resources and activities, such that it positively affects the society socially, ethically and also environmentally. The company has taken up various CSR initiatives and enhanced values in the society.

With the advent of the Companies Act, 2013 constitution of a Corporate Social Responsibility Committee of the Board and formulation of a CSR policy became a mandatory requirement. Accordingly, the company has formulated a robust CSR policy which encompasses its philosophy and guides its sustained efforts for undertaking and supporting socially useful programmes for the welfare and sustainable development of the society. The CSR policy of APL was approved by the Board of Directors on 6<sup>th</sup> August, 2014. The detail of CSR Policy of APL, August, 2014 is presented in Annexure 2.1.

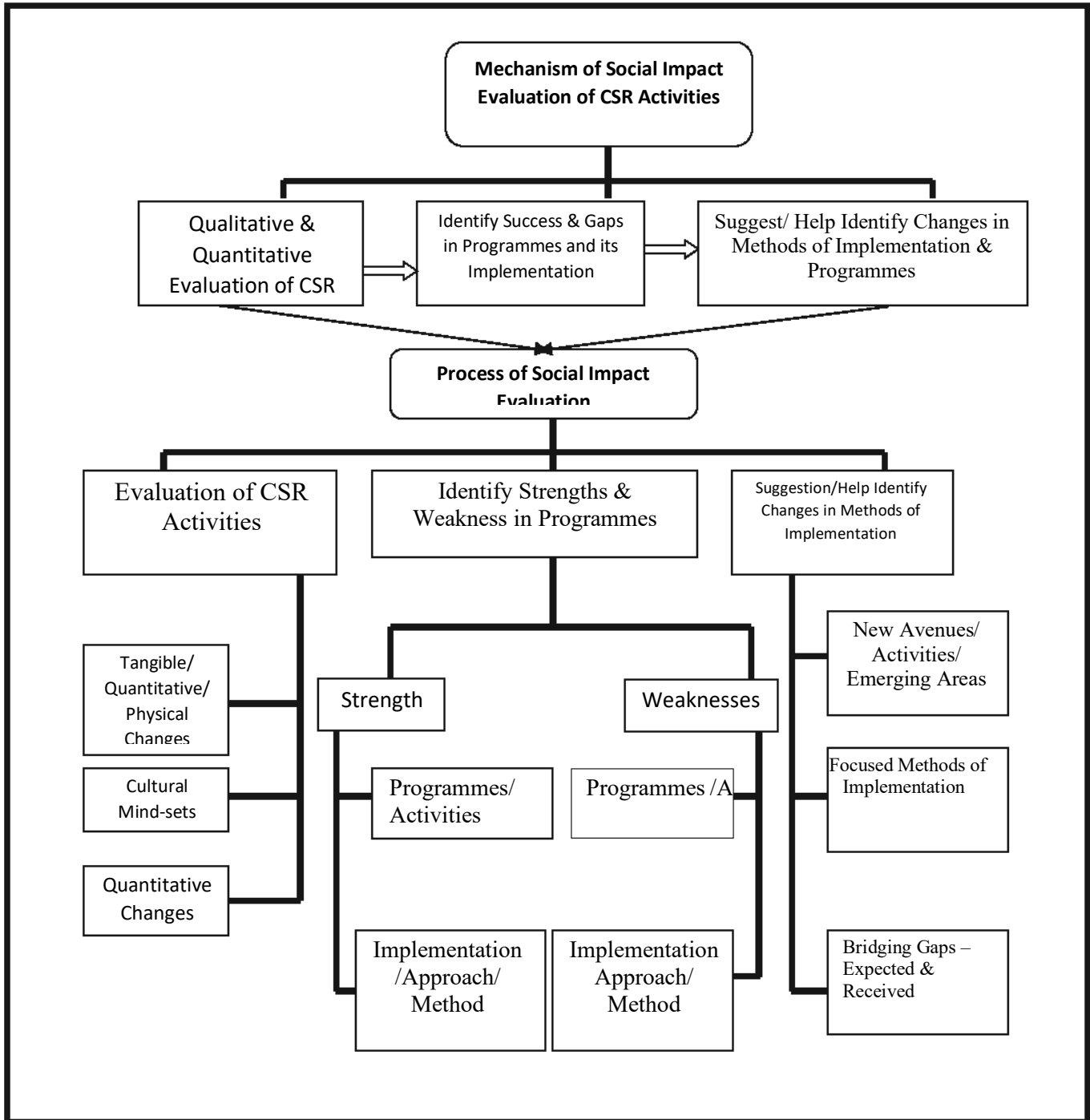
## 2.2 SOCIAL IMPACT EVALUATION (SIE)

REGL believes in growth with a human face, and pursuing people-centred development. REGL is a socially committed organization and a socially responsible corporate citizen. It attaches great importance to discharging its overall social responsibilities to the community and the society at large. In accordance with its mission of being socially responsible corporate entity with thrust on Community Development, REGL aims to focus on implementing all community development (CD) programmes in the affected/ neighbouring villages around its TPP based on the specific needs of the community assessed through the Need Assessment Survey. REGL has undertaken CSR activities as per the APL's CSR policy in approximately 77 Villages falling in CSR zone under Raigarh District of Chhattisgarh on the basis of NAS. To understand the effectiveness and utility of the CSR activities carried out, it is imperative to conduct an evaluation study to measure the social, economic & cultural impacts of the programs/activities on the community. The whole exercise aims to set long-term CD priority, which could be achieved within the specified time frame. The evaluation process would also help REGL to create positive brand image and contribute to sustainable development. Very briefly, social impact evaluation is a way of assessing the impact of CSR activities on groups/community members. The results for evaluation then guide future actions.

Social Impact Evaluation basically means the evaluation of qualitative and quantitative impact of the Community Development Programme carried out by the organization on the community. The evaluation includes assessment of the physical changes that have taken place during an identified span of time because of the activities undertaken as well as the awareness and perception of the people for whom the activities were aimed. The impact could be short term or / and long term. It could be on the economic aspect or the socio-cultural aspect or on both the aspects. This

impact would vary depending upon the efficiency and effectiveness of the CD activities carried out and the social/physical infrastructure provided to the Community. The mechanism of SIE of CSR activities is presented in Figure 2.2

**FIGURE 2.2: MECHANISM OF SOCIAL IMPACT EVALUATION OF CSR ACTIVITIES**





Social impact evaluation would help to determine the extent to which the community people have got benefited from the CSR activities implemented for them and whether CSR activities have been able to bring desired changes in the educational/ health / economic status of the communities, thereby providing an understanding of the effectiveness of the existing programs/ activities. SIE also proposes the changes that need to be undertaken in future implementation of CSR activities. SIE helps to understand the following aspects of community:

- The short-term and long-term social/cultural/economic impacts of CSR activities on the community people.
- The effectiveness of the existing programs/activities with respect to the needs of the community.
- The contribution of CSR activities in raising the living standard of people.
- The changing needs of the community people.

### 2.3 SOCIAL AUDIT (SA)

Social auditing is a process that enables an organisation to assess and demonstrate its social, economic, and environmental benefits and limitations. It is a way of measuring the extent to which an organisation lives up to the shared values and objectives it has committed itself to. Social auditing also provides an assessment of the impact of an organisation's non-financial objectives through systematically and regularly monitoring its performance and the views of its stakeholders. Social auditing requires the involvement of stakeholders. This may include employees, clients, volunteers, funders, contractors, suppliers and local residents interested in the organisation. Stakeholders are defined as those persons or organisations who have an interest in, or who have invested resources in, the organisation.

In other words, a social audit is a way of measuring, understanding, reporting and ultimately improving an organization's social and ethical performance. A social audit helps to narrow gaps between vision/goal and reality, between efficiency and effectiveness. It is a technique to understand, measure, verify, report on and to improve the social performance of the organization. Social auditing creates an impact upon governance. It values the voice of stakeholders, including marginalized/poor groups whose voices are rarely heard.

The key difference between development and social audit is that a social audit focuses on the neglected issue of social impacts, while a development audit has a broader focus including environment and economic issues, such as the efficiency of a project or programme.

### 2.3.1 Objectives of Social Audit

The prime objectives of social audit include:

- Increasing efficacy and effectiveness of community development programmes.
- Assessing the physical and financial gaps between needs and resources available for community development.
- Scrutiny of various policy decisions, keeping in view stakeholder interests and priorities, particularly of vulnerable & poor people.
- Creating awareness among beneficiaries and providers of local social and productive services.
- Estimation of the opportunity cost for stakeholders of not getting timely access to common property resources.

### 2.3.2 Advantages of Social Audit

A social audit can complement an organisation's annual financial audit by providing clear information on performance against social objectives. The results can be fed into the organisation's strategic review and planning processes to improve overall performance and social impact. It has been shown to increase accountability of the organisation to its stakeholders and to enhance democratic practice. In addition to serving as a management tool, social audits can be used for marketing, promotion and advocacy purposes. The prime advantages of social audit include:

- Encourages local democracy.
- Trains the community on participatory local planning.
- Encourages community participation.
- Benefits disadvantaged groups.
- Promotes collective decision making and sharing responsibilities.
- Develops human resources and social capital.

### 2.3.3 Process of Social Audit

CSR Audit is a formal strategic process that helps to measure company's actual social performance against the social objectives it has set for itself, and how decision making, mission statement, guiding principles, and business conduct are aligned with social responsibilities. The audit helps in discovering the interests and objectives of employees and stakeholders.

Recent research has indicated that integrating business strategy and corporate social responsibility contributes to:

- Improved community relations
- Reduced operating costs
- Increased employee satisfaction
- Corporate accountability
- Positive brand awareness

There are six key steps of Social Audit which are as follows:

#### 1. Participatory activities

- Understanding key principle of social audit.
- List core values of the programmes
- List down social objectives of the programme
- Match activities with objectives
- List current practices and delivery system
- Fix the responsibility for doing social audit
- Budget for social audit

#### 2. Defining audit boundaries and identifying stakeholders

- Elaborate key issues for social auditing based on the social objectives
- Prepare a statement of purpose, objectives, key issue and activities for social auditing.
- Identify key stakeholders for consultation (Government and civil society)
- Forge consensus on audit boundaries to identify stakeholders and formalize commitments.

#### 3. Social accounting & bookkeeping

- Select performance indicator for social accounting
- Identify what additional with existing records can be used.

- Identify what additional data to be collected, who would collect this data and how
- When stakeholders would be consulted and about what?
- Prepare a social accounting plan timeline
- Plan for monitoring social accounting activities

#### **4. Preparing and using accounts**

- Prepare social accounts using existing information, data collection and views of stakeholders
- Identify key issues for action
- Take stock of objective, activities and core values
- Set targets for future

#### **5. Social audit & dissemination**

- Presenting social accounts to social auditors
- Social auditors verify data and comment on the quality of social accounting and reporting
- Social auditor has to collect information from the stakeholders regarding programme implementation and benefits accrued to them
- Disseminate social auditors consolidate report to the decision making committee
- Disseminate report to civil society
- Begin next cycle of social accounting

#### **6. Feedback & institutionalization of social audit**

- Feedback for fine tuning of policy legislation, administrative functioning and programming towards social objectives
- Follow up action
- Reviewing support to civil society for the participation
- Institutionalization of process

Following are key factors for successful Social Audit:

- Level of information shared with and involvement of stakeholders, particularly of the rural poor, women, and other marginalized sections.
- Commitment, seriousness and clear responsibilities for follow-up actions.
- Involvement of key facilitators in the process.

## 3.0 METHODS & TOOLS FOR SA & SIE

The Social Audit (SA) & Social Impact Evaluation (SIE) has been conducted using primary data as well as secondary data available with the Districts & Blocks as well as APL and REGL. Interview with the local people and discussions with community, Government officials and community based organizations of the area were an important component of the study.

Conducting SA & SIE involve the use of a broad array of data collection methods, quantitative and qualitative, common in social science research. Often, a combination of tools may be required to do SIE and SA. In addition to substantive analytical tools, SA&SIE use participatory methods that contribute to a better understanding of the social as well as cultural issues.

### 3.1 DATA COLLECTION PROCEDURE

There are several methods of collecting data for purposes of conducting SA and SIE. The methods generally in use include:

#### *Quantitative Methods*

- Sample survey
- Other administrative records

#### *Qualitative Methods*

- Key beneficiaries/informant interviews
- Focus Group Discussions (FGDs)
- Rapid Rural Appraisal (RRA)/Participatory Rural Appraisal (PRA)
- Public consultation

The sample villages were selected representing whole CSR region of the REGL's TPP for the present study. We have used both primary and secondary data for the study. The secondary data have been collected from the various source, namely, Census of India, Health Department, Education department, office of ICDS, Statistical department of the concerned district. The primary data have been collected from the beneficiaries of different programmes, Local community, Representatives of Gram Panchayets etc. from selected villages. The overall impact of CSR activities has been assessed for the last three years i.e. 2020-21 to 2022-2023. The data collection work has been executed in two phases; under Phase-I, we developed rapport with different local communities, representatives of Gram Panchayat and some key persons of the selected villages and also approached different government officers of the concerned Blocks and District. Under Phase-II, we collected all relevant data from different sources. We recorded

qualitative observations from Focus Group Discussion (FGDs), interviews with beneficiaries and Gram Panchayat members during our field survey. The field survey and data collection were initiated in November, 2022 and completed in February, 2023. All the collected data were coded for computerization and subsequent analysis. All the data were then fed into the software of Statistical Package for Social Sciences (SPSS) and rechecked before analysis. The study tools, sample size for different targeted activities and methodology are given below:

## 3.2 SAMPLING & ANALYTICAL TOOLS

### 3.2.1 Sampling Tools, Sample Size and Coverage

Depending on the nature of information required, we developed six types of schedules/questionnaires for different target groups, namely, Beneficiaries under different programme, Village schedule for Gram Panchayats, schedule for Focus Group Discussions (FGDs) of communities, profiling of the CSR activities through local people, questionnaires for concerned government officials and thematic points for field observations. The tools and coverage by respondents have been given in Table 3.1.

**TABLE 3.1: SAMPLING TOOLS, SAMPLE SIZE AND COVERAGE**

Sampling Tools	Respondent	Sample Size	Scope
<b>Part-A: Individual Beneficiary-Oriented Activities</b>			
Beneficiary Schedule	Beneficiaries of Different programmes	At least 5 beneficiaries from each programme in each village (if <5, then all)	Obtain information on socio-economic, educational and demographic features of the households, type of benefits and its impact and need of the household
<b>Part-B: Community Beneficiary-Oriented Activities</b>			
Schedule for profiling the CSR activities	A group comprised of representatives of local body, Prominent Local People and Local communities	One Schedule administered in each village	Profiling of all the activities executed under CSR in the village

Sampling Tools	Respondent	Sample Size	Scope
Schedule for Focus Group Discussions (FGDs)	Representatives of Local body, Prominent people, Representatives of weaker sections and project affected persons, if any	One FGD organized in each village and discussion initiated with 8-10 members of the specified areas ensuring gender representation	Community needs, quality of work/services & impact of executed activities like Infrastructural, Socio-cultural, Awareness, Livestock and Programmes for changing the traditional agricultural production system or any other CSR activities.
Village Schedule	Representatives of Gram Panchayat & Prominent people	One Schedule administered in each village	Availability of basic amenities, Demographic, Socio-economic and educational characteristics etc.
Qualitative Information	Self Observation	All team members	Impact on socio-economic - cultural –political aspects and any specific fact beyond the purview of structured schedule.
<b>Part-C: Collection of Secondary Data</b>			
Questionnaires /Data Format for Education Department	BSA/Coordinator from concerned Block Resource Centre	One from each Block	Population of the school going (6-14 years) children, enrolment, dropout, never enrolled children by gender and caste, retention etc.
Questionnaires/Data Format for Health Department	CMO/Medical Officer from PHC/CHC	One from each Block	Health status of the people regarding no. of cases of Measles, TB, Polio, Malaria and birth & death rate of the concern areas.
Questionnaires/Data Format for ICDS Department	DPO/CDPO of concerned Block	One from each Block	Immunization, information regarding mother and child care, IMR, MMR, U5MR

The sample copy of the questionnaires/formats developed for social impact evaluation of REGL's TPP along with social audit of CSR activities is presented in Annexure 3.1.

### 3.2.2 Method for Sampling and Administration of Tools

The method adopted for survey and selection of sample was simple random sampling and purposive sampling. The simple random method has been used for the selection of different types of beneficiaries and purposive method was used for the selection of persons for FGDs and profiling the executed activities in the villages. The details are given in Table 3.2.

**TABLE 3.2: METHODS OF SAMPLING AND ADMINISTRATION OF TOOL**

Particulars	Sample method	Method for Administration of Tools
For collection of basic information of the village	The member of the team approached the concerned representatives of Gram Panchayats and prominent people of the village.	Individual interviews were conducted with the representatives of gram Panchayat and prominent people of the village avoiding the crowd.
Profiling the Executed Activities	For this purpose, we purposively selected groups, consisting of representatives of local body, prominent local people and local communities in each CSR village.	Identified the target persons with the help of facilitators. Due care for ensuring gender representation was taken. The date, time and venue for profiling of activities were fixed with the prior consent of identified persons. A two-member team in which one was monitor and other was writer started the profiling in a pre-decided venue.
Beneficiary from Different Programmes	We have arranged the list of beneficiaries in alphabetical orders and then randomly selected the desired number. The additional sample has been taken to compensate the sample loss.	Trained members of the team approached the selected beneficiary with the help of facilitator and established rapport building. The individual interview was conducted in the house of the respondent avoiding the crowd.



Particulars	Sample method	Method for Administration of Tools
Focus Group Discussions (FGDs)	For this exercise, we have purposively selected a group consisting of the representatives of local body, prominent people, representatives of weaker section and project affected person, if any, in each CSR village.	Identified the targeted persons with the help of facilitators ensuring gender representation. The date, time and venue for FGD fixed with the consent of the identified group. The two members of the team, in which one was monitor and the other was writer, started the FGD on pre-fixed venue. The monitor raised questions/issues and encouraged the members to discuss and explore the facts. The writer recorded the entire discussion in structured schedule and a voice recorder was also used for recording the matter of discussion.
Qualitative Information	In the above process each team member recorded his own observation on selected issues. The significant observation helped to understand the complicity of the data.	
Information from Secondary sources	The team members requested the District Magistrate, Raigarh, to provide his support and cooperation for collection of necessary data from different departments and for this purpose, the DM issued a letter to all concerned departments. The team members approached the concerned office and requested officers to provide the information on questionnaires. The concerned departments provided the available data.	

### 3.3 FRAMEWORK FOR SOCIAL AUDIT

As discussed earlier the framework for Social Audit was evolved including Social Process Method clubbed with Activity Analysis Approach. This uses SA4P focus system that assesses an activity around 4Ps viz. Policy, People, Process, Programmes. The individual weightage against these factors shall sum up to gross assessment measurable figure on a pre framed scale.

The social impact assessment of CSR activities was undertaken on following lines :

- Design Quality
- Measurable Quantitative Progress - Days/Coverage/Change in Income/Money saved / Mandays etc.
- Programme Approach
- Satisfaction of Stakeholders

The impact assessment matrix was evolved considering above mentioned factors as presented in subsequent sections:

Stage	Process	Output
Stage 1	Identification of SA Indicators	The SA team suggested 3 categories of 29 indicators : <ul style="list-style-type: none"> <li>• Policy and Process -2</li> <li>• Programme Factors –4</li> <li>• Sample Activity/Observation type - 23</li> </ul>
Stage 2	Identification of Social Audit Compliance factors	7 points identified to factor the procedural appropriateness of SA
Stage 3	Awarding points and then weight award by the SA team in consultation with the independent field observers	A set of 29 indicators + 1 SA factor for calculating the SA Point weight
Stage 4	Boxing the qualitative and few standard quantitative observations based on FGD and other interactions in scale of Good, Average and Bad.	A summary table delivering SA Point Weight, effectiveness checks and other quantitative details of coverage and expenditure along with brief comment by SA Team.
Stage 5	Sharing of SA findings with the stakeholders in REGL_AF and local villages.	SA is available to the community to catalyze the performance for better score during next assessment year.

### Point Weightage for Selected Components

Such weightage was attributed by the SA team after analyzing the relative importance of the activities to the overall understanding of Social Audit objectives as per the ToR. The assessment scheme provides adequate approach to include following dimensions:

1. Direction (Positive to Negative that can lead to interpretation of Good and Poor)
2. Degree of Direction over a scale of -3 to +3 scale.

Each section focuses on certain aspect of assessment through a number of questions that the assessment team has placed against a 3 tail response pattern indicating – 1. The optimum side 2. The neutral point and -3. The Cause of concern point.

Once the gross point weight of each section is summed up it is available to reflect the overall health of CSR activities, policies and approach. But in order to be more rational we further multiply this with Social Audit procedural correctness factor which gives the final output value of SA score.

The list of SA Indicators as well as the weight attributed to each indicator are as follows:

S N	SA Indicator	Weightage
<b>CSR POLICY &amp; PROCESS:</b>		
1	Overall Common Factors –I (POLICY)	5X
2	Overall Common Factors-II (PROCESS)	5X
Sub-total		10X
<b>CSR PROGRAMME:</b>		
3	Programme Common Factors (PROGRAMME)	4X
4	Programme Specific Factors (COMMUNITY HEALTH)	5X
5	Programme Specific Factors (EDUCATION)	3.5X
6	Programme Specific Factors (SUSTAINABLE LIVELIHOODS)	5X
7	Programme Specific Factors ( RURAL INFRASTRUCTURE)	2.5X
Sub-total		21X
<b>CSR ACTIVITIES:</b>		
8	Sample Activity Health : Mobile Health Care Unit (MHCU)	12X
9	Sample Activity Health : Support to Physically Challenged People	1.5X
10	Sample Activity Health : Health Camp & Hand washing campaign	1.5X
11	Sample Activity Education : Placement of Community Teachers	3X
12	Sample Activity Education : Activity Based Learning	3X
13	Sample Activity Education : Teaching Aids Support	3X
14	Sample Activity Education: Coaching class for Competitive	3X



S N	SA Indicator	Weightage
	Examination	
15	Sample Activity Education: Promotion of Sport & Game	3X
16	Sample Observation Sustainable Livelihoods : Skill Development Training	5X
17	Sample Observation Sustainable Livelihoods : Formation & Development of SHGs	3X
18	Sample Activity Sustainable Livelihoods : Mushroom Cultivation Training	5X
19	Sample Activity Sustainable Livelihoods : Vegetable Cultivation Training	4X
20	Sample Observation Sustainable Livelihoods : Live stock Development	3X
21	Sample Activity Rural Infrastructure- Construction of Community Center	7.5X
22	Sample Activity Rural Infrastructure- : Construction of Flood Relief Center	7X
23	Sample Activity Rural Infrastructure- Construction of Fence	3X
24	Sample Activity Rural Infrastructure- : Development of School Infrastructure	2.5X
<b>Sub-total</b>		<b>70X</b>
<b>Grand total</b>		<b>100X</b>

### 3.4 FIELD SURVEY & DATA COLLECTION

#### 3.4.1 Reconnaissance Survey

A kick-off meeting was organised on 9<sup>th</sup> November, 2022 to discuss the modalities for initiating the social audit and social impact evaluation study and logistic support required for the same under the guidance of Shri R. N. Shukla, Head, Corporate Environment Group, APL and Shri Arindam Rout, Head (Environment), REGL with IISWBM team members.

During the introductory meeting with Shri R. N. Shukla, Head, Corporate Environment Group, APL and Shri Arindam Rout, Head (Environment), REGL along with Shri Purnendu Kumar, CSR Head, REGL and IISWBM team members, following issues were discussed & resolved to initiate the social audit & social impact evaluation study for REGL's TPP:

1. Initially Shri R. N. Shukla mentioned the objectives of proposed study as well as time period which need to be considered for the same. Shri Arindam Rout and Shri Purnendu Kumar explained the various CSR activities undertaken during last three years i.e. 2020-21 to 2022-23 and emphasised the recent CSR interventions of REGL and their salient

features viz. Sustainable Livelihood Development, Water Conservation & Rain Water Harvesting, Strengthening of Health and Sanitation facilities, Live Stock Development, etc as well as various IG activities for women empowerment like mushroom cultivation, tailoring, Bio-manure, etc. Subsequently Shri Shukla highlighted the prime thrust area and coverage of proposed study to be undertaken by IISWBM and mentioned that the study should consider all the major social issues in line with the regulatory agency's requirement as well as needs of local people while assessing the impact of CSR activities on local community in particular and on region as a whole. Accordingly, various parameters included in the draft questionnaire submitted by IISWBM for social audit & social impact evaluation study have been discussed. Shri Arindam Rout & Shri Purnendu Kumar mentioned that the proposed questionnaire may be used for pilot survey and on the basis of pilot survey certain parameters to address the local people need may be included, if required. Accordingly, it was resolved that the suggestions made during discussion as well as the observation recorded during the pilot survey would be incorporated in the proposed questionnaire and the same would be subsequently used for the field survey and data collection.

2. Subsequently the detail meeting was held with Shri Arindam Rout, Head (Environment) and Shri Purnendu Kumar, Head CSR, Adani Foundation, REGL with IISWBM team members to understand the CSR activities of REGL being undertaken by AF-REGL. Shri Kumar highlighted the new intervention initiated for skill development and income generation besides the other SLD, Education, Health and Infrastructure Development activities. The following information and documents were provided by CSR Cell of Adani Foundation, Bade Bhandar:
  - a. List of CSR villages along with name of Gram Panchayet and contact person;
  - b. Copy of Annual Report of CSR for 2020-21 and 2022-23 along with Budget and Expenditure.
  - c. Detail of CSR activities undertaken during last three years i.e. 2020-21 to 2022-23.

Dr. Agrawal requested to Shri Kumar to kindly provide village wise detail of CSR activities undertaken along with cost incurred for last three years i.e. 2020-21 to 2022-23. Shri Kumar ensured to provide all the information related to CSR activities of REGL required for the present study. Accordingly, Dr. Agrawal submitted checklist of detailed information required in connection with CSR activities of REGL.

3. It was resolved that the formal letter to sarpanch of selected GPs may be given in advance (at least 1-2 days) mentioning the objectives and modus operandi of social audit and social impact evaluation study. The format for the same as well as social impact of various CSR activities undertaken and suggestions for improvement was evolved under the guidance of Shri R N Shukla and Shri Arindam Rout.
4. The time schedule for initiating the field survey and data collection was discussed in view of technical as well as logistic support required for the same. Shri Shukla suggested to undertake field survey and data collection in consideration of major CSR activities undertaken by AF-REGL as well as various stakeholders involved in the present study and the same was agreed by IISWBM project team.

### **3.4.2 Field Survey & Data Collection**

As discussed in earlier section, the field survey and data collection was undertaken between January-February, 2023 (Figure 3.1). The series of public consultation meeting conducted involving Sarpanch/ Upsarpanch/ member of Gram Panchayet along with the local people to evaluate the social impact of setting up and operation of REGL's TPP along with the evaluation of social impact of CSR activities undertaken by AF-REGL during the last three years i.e. 2020-21 to 2022-23 as well as their suggestions for improving the quality of life of local people in all the core as well as buffer zone villages falling within the 10 km radius of the REGL's Thermal Power Plant. The sample copy of FGD- public consultation intimation letter issued to Sarpanch/ Upsarpanch with request to organize public consultation on pre-decided date and time involving local people for the purpose along with endorsement regarding their presence during public consultation and the social issues identified along with their suggestions for the same is presented in Annexure 3.1.

Assessment of the existing basic amenities and infrastructural facilities along with the changes due to setting up and operation of REGL's TPP as well as need for strengthening the same in the concerned villages was also undertaken. The detail of surveyed CSR villages is presented in Table 3.3.

FIGURE 3.1: FIELD SURVEY & DATA COLLECTION FOR SIE AND SA FOR REGL's TPP



**TABLE 3.3: DETAIL CSR VILLAGES SURVEYED FOR SIE AND SA FOR REGL'S TPP**

Sl. No.	Schedule No.	Village	GP	Block	District	CSR Zone
1	SA/REGL-01	Bade Bhandar	Bade Bhandar	Pusour	Raigarh	CZ
2	SA/REGL-02	Sarvani	Sarvani	Pusour	Raigarh	CZ
3	SA/REGL-03	Chhote Bhandar	Chote Bhandar	Pusour	Raigarh	CZ
4	SA/REGL-04	Amlipali	Chote Bhandar	Pusour	Raigarh	CZ
5	SA/REGL-05	Jeveridih	Chote Bhandar	Pusour	Raigarh	BZ-I
6	SA/REGL-06	Kotmara	Kotmara	Pusour	Raigarh	BZ-I
7	SA/REGL-07	Barpali	Barpali	Pusour	Raigarh	BZ-I
8	SA/REGL-08	Amlipali	Kotmara	Pusour	Raigarh	BZ-I
9	SA/REGL-10	Tupakdhar	Taprda	Pusour	Raigarh	BZ-I
10	SA/REGL-11	Kathli	Taprda	Pusour	Raigarh	BZ-I
11	SA/REGL-12	Supa	Supa	Pusour	Raigarh	BZ-I
12	SA/REGL-13	Thengagudi	Supa	Pusour	Raigarh	BZ-I
13	SA/REGL-14	Jatri	Jatri	Pusour	Raigarh	BZ-I
14	SA/REGL-15	Bunga	Bunga	Pusour	Raigarh	BZ-I
15	SA/REGL-16	Ranbhatha	Ranbhatha	Pusour	Raigarh	BZ-I
16	SA/REGL-17	Semra	Semra	Pusour	Raigarh	BZ-I
17	SA/REGL-18	Semibhwar	Semra	Pusour	Raigarh	BZ-II
18	SA/REGL-19	Tilgi	Tilgi	Pusour	Raigarh	BZ-I
19	SA/REGL-20	Karichhapar	Siha	Pusour	Raigarh	BZ-I
20	SA/REGL-21	Pusalda	Pusalda	Pusour	Raigarh	BZ-II
21	SA/REGL-22	Sankarpali	Pusalda	Pusour	Raigarh	BZ-I
22	SA/REGL-23	Chikhli	Chikhli	Pusour	Raigarh	BZ-I
23	SA/REGL-24	Raibar	Raibar	Pusour	Raigarh	BZ-I
24	SA/REGL-25	Litaipali	Litaipali	Pusour	Raigarh	BZ-I
25	SA/REGL-26	Rawnkhondhra	Litaipali	Pusour	Raigarh	BZ-II
26	SA/REGL-27	Siha	Siha	Pusour	Raigarh	BZ-I
27	SA/REGL-28	Bonda	Bonda	Pusour	Raigarh	BZ-I
28	SA/REGL-29	Siladi	Bonda	Pusour	Raigarh	BZ-II
29	SA/REGL-30	Jiladi	Bonda	Pusour	Raigarh	BZ-II
30	SA/REGL-31	Nawapara B	Nawapara B	Pusour	Raigarh	BZ-II
31	SA/REGL-32	Khaprapali	Nawapara B	Pusour	Raigarh	BZ-II
32	SA/REGL-33	Raipali	Nawapara B	Pusour	Raigarh	BZ-II





Sl. No.	Schedule No.	Village	GP	Block	District	CSR Zone
33	SA/REGL-34	Singpuri	Baradoli	Pusour	Raigarh	BZ-II
34	SA/REGL-35	Ruchida	Ruchida	Pusour	Raigarh	BZ-II
35	SA/REGL-36	Gotama	Gotama	Pusour	Raigarh	BZ-II
36	SA/REGL-39	Lankapali	Nandeli	Pusour	Raigarh	BZ-II
37	SA/REGL-40	Chichor Umariya	Chichor Umariya	Pusour	Raigarh	BZ-II
38	SA/REGL-41	Kensera	Kensara	Pusour	Raigarh	BZ-II
39	SA/REGL-42	Badimal	Kensara	Pusour	Raigarh	BZ-II
40	SA/REGL-43	Tetla	Tetla	Pusour	Raigarh	BZ-II
41	SA/REGL-46	Putkapuri	Putkapuri	Pusour	Raigarh	BZ-II
42	SA/REGL-47	Basanpali	Basanpali	Pusour	Raigarh	BZ-II
43	SA/REGL-48	Bulaki	Kwrika	Pusour	Raigarh	BZ-II
44	SA/REGL-51	Changhori	Pasapali	Pusour	Raigarh	BZ-II
45	SA/REGL-52	Salhepali	Bhatpur	Pusour	Raigarh	BZ-II
46	SA/REGL-53	Surri	Surri	Pusour	Raigarh	BZ-II
47	SA/REGL-54	Ghughwa	Ghughwa	Pusour	Raigarh	BZ-II
48	SA/REGL-55	Torna	Ghughwa	Pusour	Raigarh	BZ-II
49	SA/REGL-56	Chuhipali	Nansiya	Raigarh	Raigarh	BZ-II
50	SA/REGL-57	Kurmapali	Kurmapali	Pusour	Raigarh	BZ-II
51	SA/REGL-58	Thakurpali	Ourabhatta	Raigarh	Raigarh	BZ-II
52	SA/REGL-59	Tekka	Pacheda	Pusour	Raigarh	BZ-II
53	SA/REGL-60	Amaldiha	Pacheda	Pusour	Raigarh	BZ-II
54	SA/REGL-61	Pacheda	Pacheda	Pusour	Raigarh	BZ-II
55	SA/REGL-63	Kouwantal	Kouwantal	Pusour	Raigarh	BZ-II
56	SA/REGL-64	Raitarai	Kouwantal	Pusour	Raigarh	BZ-II
57	SA/REGL-65	Jampali	Telipali	Pusour	Raigarh	BZ-II
58	SA/REGL-66	Gorra	Gorra	Pusour	Raigarh	BZ-II
59	SA/REGL-69	Linjir	Linjir	Pusour	Raigarh	BZ-II
60	SA/REGL-70	Bijna	Jogitari	Pusour	Raigarh	BZ-II
61	SA/REGL-71	Nandeli	Nandeli	Pusour	Raigarh	BZ-II
62	SA/REGL-72	Chandli	Chandli	Dabhra	Jajgir-Champa	BZ-I
63	SA/REGL-73	Kalma	Kalma	Dabhra	Jajgir-Champa	BZ-II
64	SA/REGL-74	Mahadevpali	Kalma	Dabhra	Jajgir-Champa	BZ-II



Sl. No.	Schedule No.	Village	GP	Block	District	CSR Zone
65	SA/REGL-75	Palsada	Palsada	Dabhra	Jajgir-Champa	BZ-I
66	SA/REGL-76	Bhirha Bhattha	Palsada	Dabhra	Jajgir-Champa	BZ-I

The impact/feedback of CSR activities undertaken by REGL at villages around TPP as well as railway track were undertaken during the field survey and data collection. The priorities of local people were also identified for undertaking CSR activities.

### 3.4.3 Focus Group Discussions

An exhaustive guideline for conducting public consultation through Focus Group Discussions (FGD) was also developed. For discussion with male groups, various thematic areas were selected which included village history and its natural resources, access to public services, employment, housing, farm and non-farm livelihood, landholding and poverty, access to institutional credit and transportation facilities. The thematic areas selected for discussion with women groups included PDS, Anganwadi, Primary Education, Women employment, drudgery and health issues.

The following Participatory Rural Appraisal (PLA) techniques were applied in the assessment process:

- Resource mapping
- Social mapping
- Input – Output tree
- Timeline analysis
- Health chart
- Institution mapping

The series of public consultation meeting conducted involving Sarpanch/ Upsarpanch/ member of Gram Panchayet along with the local people to identify the likely social issues as well as their suggestions for tackling the same in all the core as well as buffer zone villages falling within the 10 km radius of the REGL's TPP (Figure 3.2).

The public consultation intimation letters were issued to Sarpanch/ Upsarpanch with request to organize public consultation on pre-decided date and time involving local people. The local people participated in the public consultation were enlisted and their endorsement regarding their presence during public consultation were taken. During the public consultation, various social issues were identified along with their suggestions for mitigating the same were



documented. Assessment of the existing basic amenities and infrastructural facilities along with the need for strengthening the same in the concerned villages was also undertaken.

**FIGURE 3.2: FGDs WITH SHGs AND OTHER STAKE HOLDER TO ASSESS THE IMPACT OF SLD ACTIVITIES OF AF-REGL**



## 4.0 SOCIO-ECONOMIC PROFILE OF CSR ZONE

The Socio-economic profile of REGL's CSR zone have been assessed using primary as well as secondary available with the Districts & Blocks as well as APL and REGL. Interview with the local people and discussions with community, Government officials and community based organizations of the area were an important component of the study. To assess the availability of basic amenities and other allied infrastructural facilities, all the villages falling under REGL CSR zone have been considered. Accordingly, detailed village profile survey was undertaken through structured questionnaire. PRA/RRA techniques were also adopted for the purpose. In addition to substantive analytical tools, use of participatory methods that contribute to a better understanding of the social as well as cultural issues.

### 4.1 DEMOGRAPHIC PROFILE OF CSR ZONE

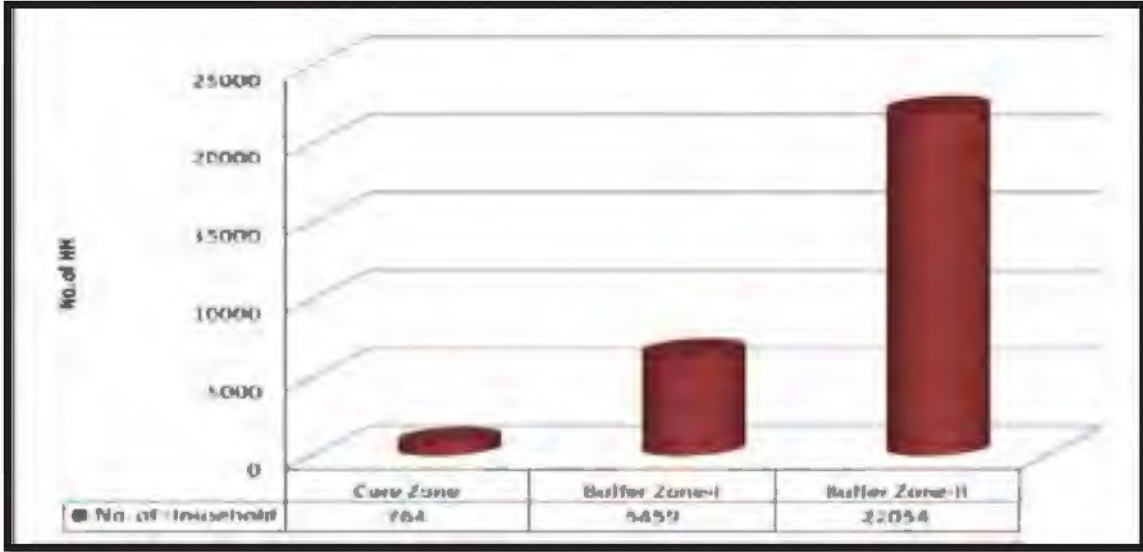
As mentioned in earlier chapter the REGL's Thermal Power Plant (TPP) is located at Bade Bhandar village under Pussore Tehsil of Raigarh district, Chhattisgarh. The CSR Zone i.e. 10 km radius of TPP falls primarily under Pussore Tehsil. The CSR zone have been divided in three zone i.e. core zone which consist of 4 villages from which majority of land was acquired for setting up of 1 x 600 MW TPP therefore socio-economic impact to these villages are likely to be maximum accordingly given maximum priority to these villages for planning and execution of need based CSR activities. Whereas buffer zone-I (i.e. the villages falling within the 5 km radius of TPP) have 27 village and buffer zone-II (i.e. the villages falling within the 5-10 km radius of TPP) 96 village (Annexure 4.1). The demographic profile of the CSR zone has been presented in following sections.

#### 4.1.1 Population & Gender Wise Distribution

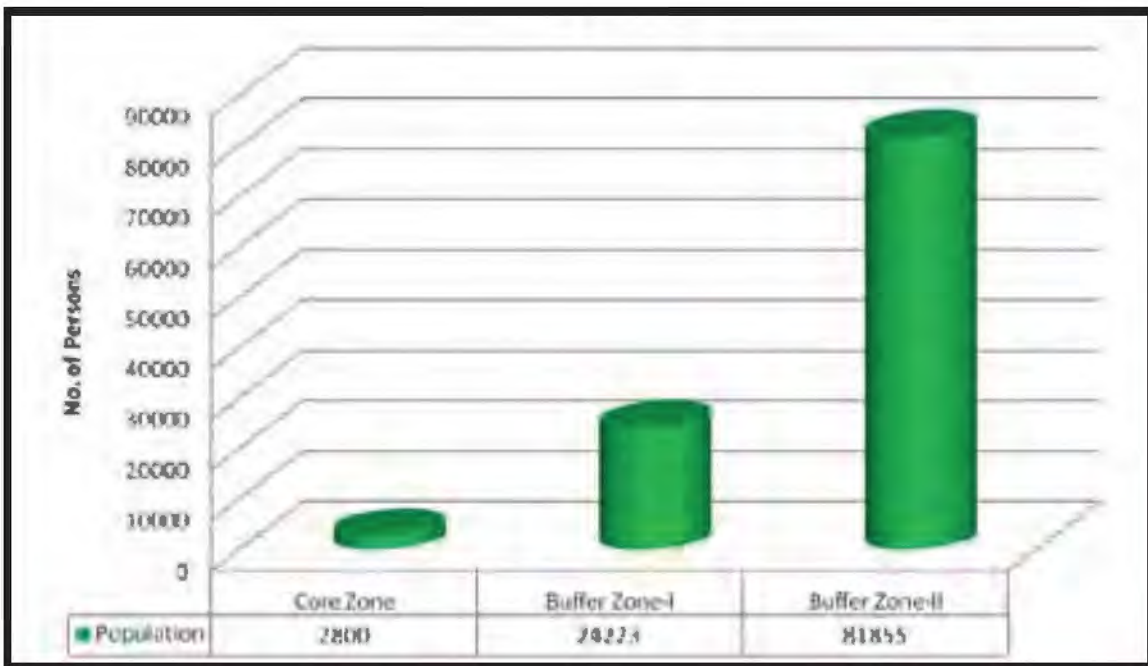
Demographic profile of villages falling under core zone, buffer zone-I and II of REGL's TPP is presented in Annexure 4.2. The analysis reveals that total number of households in core zone are 764 with total population of 2800 in core zone villages (Figure 4.1 and 4.2).

Gender wise distribution of population in CSR villages is presented in Figure 4.8. It shows that in core zone 50.86% of the population are male and remaining 49.14% are female. Whereas in buffer zone-I, male population is 50.07% against 49.93% female population. Overall gender wise distribution of population in CSR zone is presented in Figure 4.3. It reveals that 50.38% of the population are male and remaining 49.62% are female in the CSR zone of REGL.

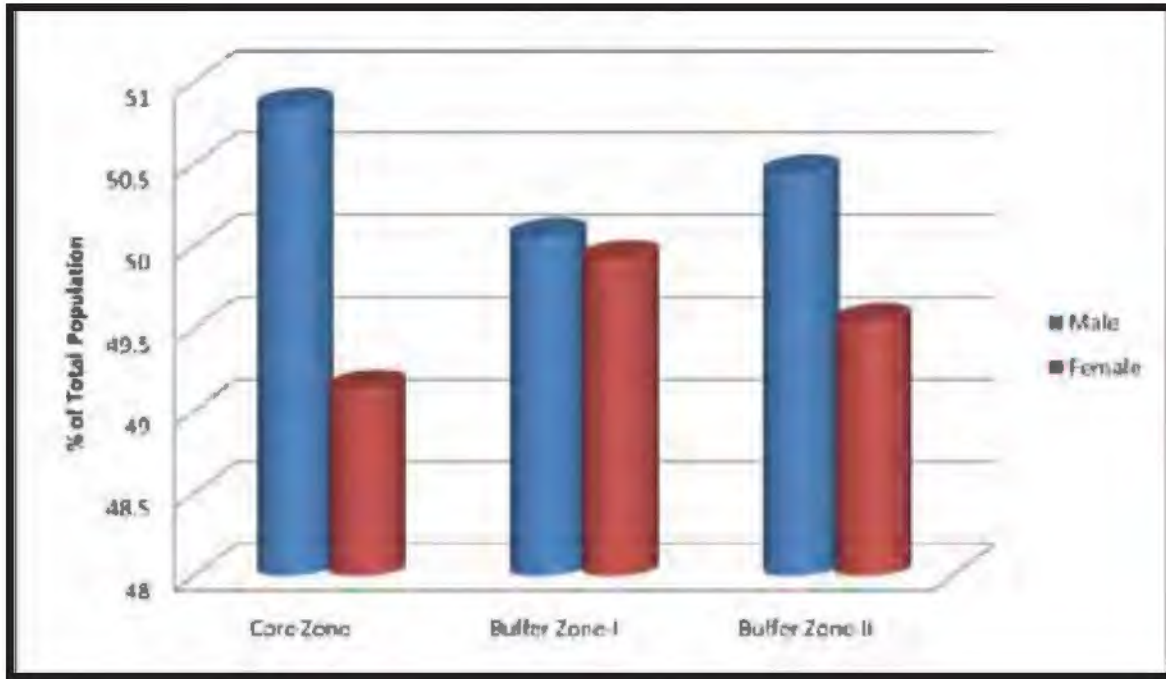
**Figure 4.1: Zone-Wise Distribution of Number of Households of REGL-CSR Zone Villages**



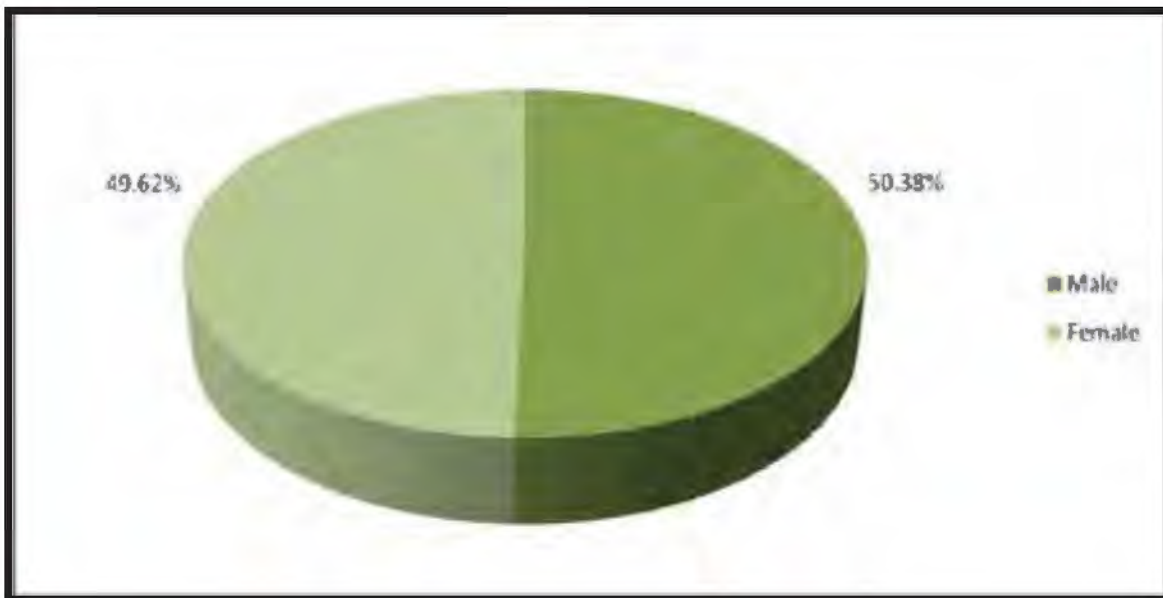
**Figure 4.2: Zone-Wise Status of Population of REGL-CSR Zone Villages**



**Figure 4.3: Gender Wise Distribution of Population in REGL-CSR Zone Villages**

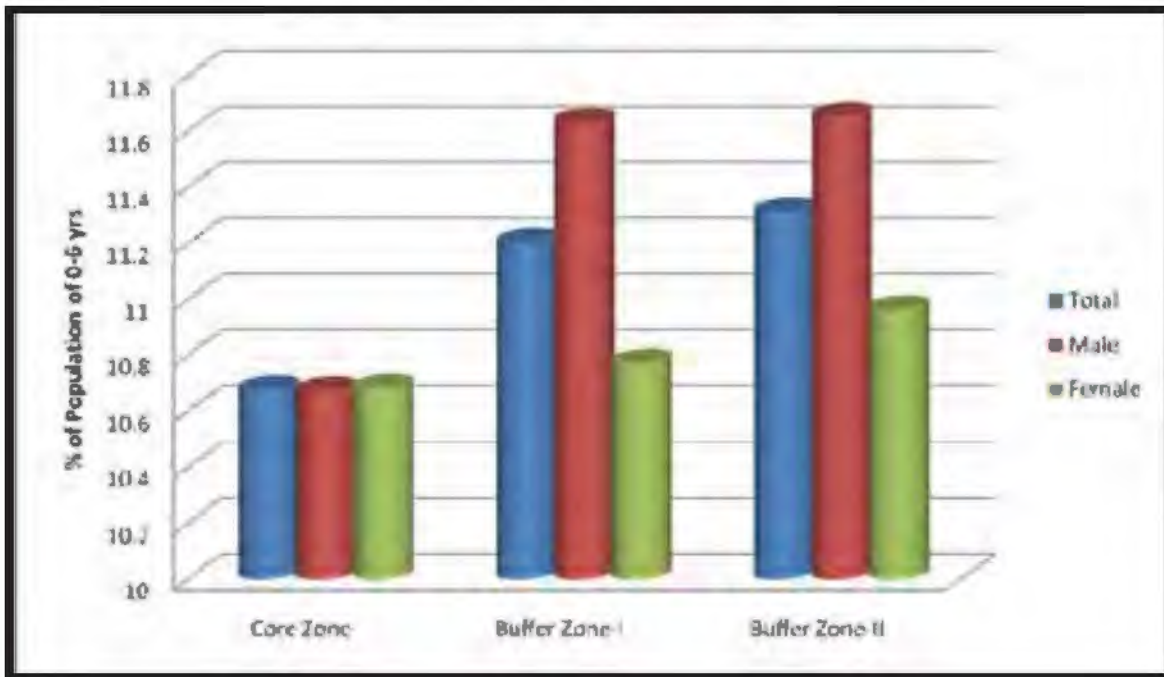


**Figure 4.4: Overall Gender Wise Distribution of Population in REGL-CSR Zone**



Analysis of status of child population (0-6 years) in CSR zone of REGL reveals that 11.27% are children (0-6 years) of total population in CSR zone (Figure 4.5). The analysis further shows that the sex ratio among child population is comparatively higher i.e. 985 females per 1000 male as compared to overall sex ratio i.e. 913 females per 1000 male in CSR zone.

**Figure 4.5: Percentage Distribution of Population of 0-6 Years in REGL-CSR Zone Villages**



#### 4.1.2 Social Stratification

Distribution of scheduled caste population in CSR zone of REGL is presented in Figure 4.6. It reveals that 13.50% are scheduled caste of total population in CSR zone of REGL. The analysis further shows that 13.36% are male SC of the total male population and 13.65% are female SC of the total female population of CSR zone of REGL. Whereas 7.11% are SC of total population in core zone.

Distribution of scheduled tribe population in CSR zone of REGL is presented in Figure 4.7. It reveals that 25.33% are scheduled tribe of total population in CSR zone of REGL. The analysis further shows that 25.19% are male ST of the total male population and 25.47% are female ST of the total female population of CSR zone of REGL. Whereas 45.46% are ST of total population in core zone.



Figure 4.6: Status of SC in REGL-CSR Zone Villages

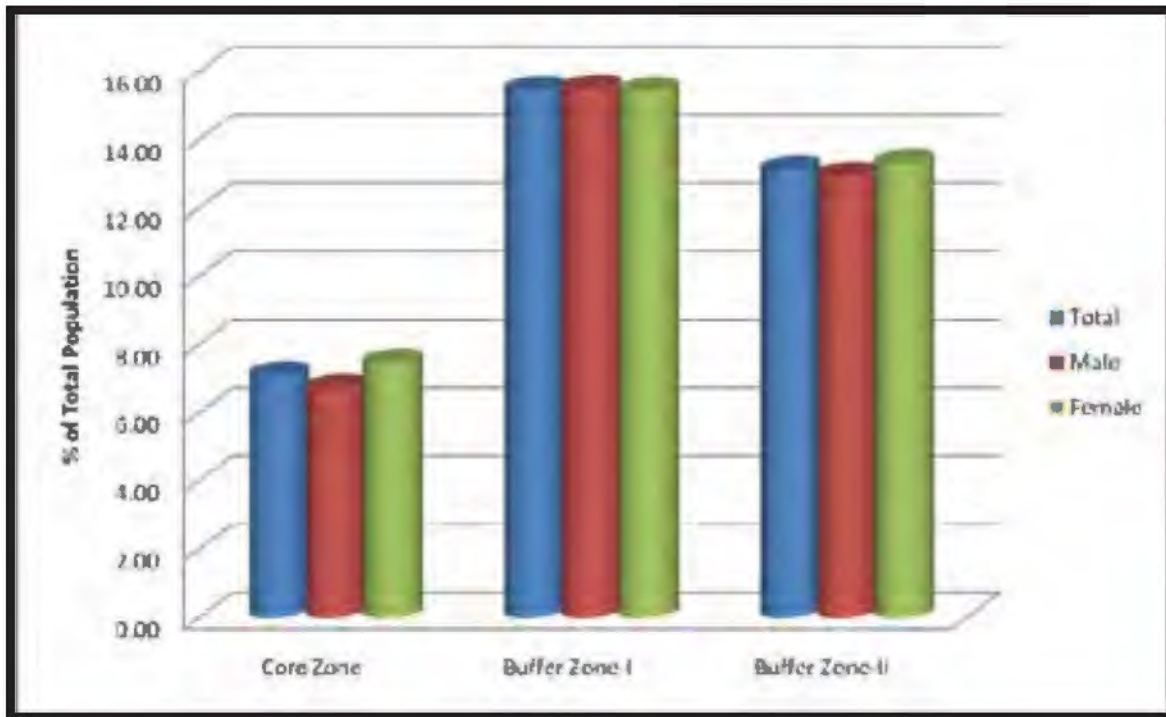
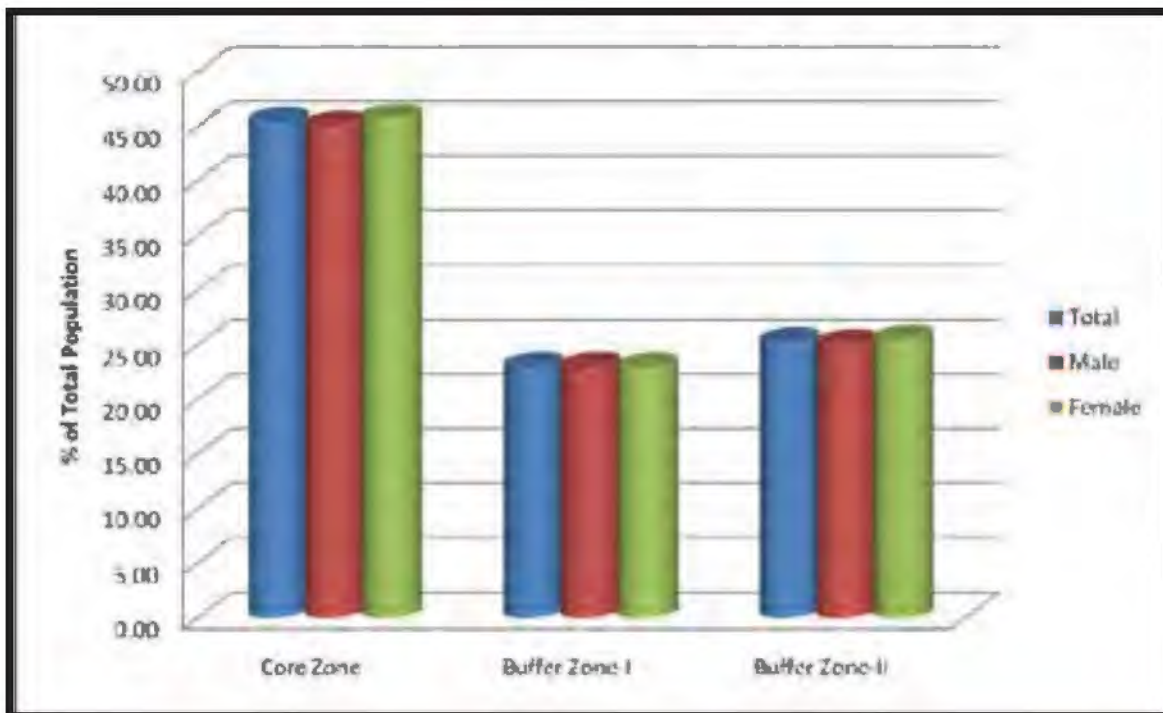


Figure 4.7: Status of ST in REGL-CSR Zone Villages



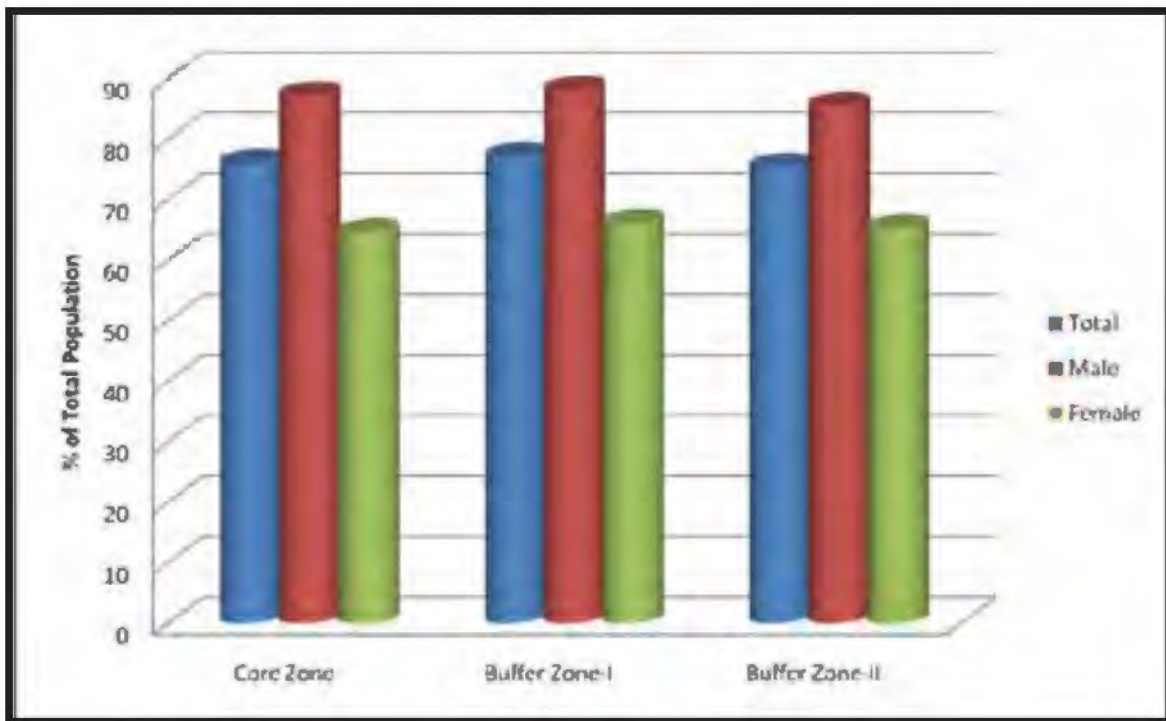


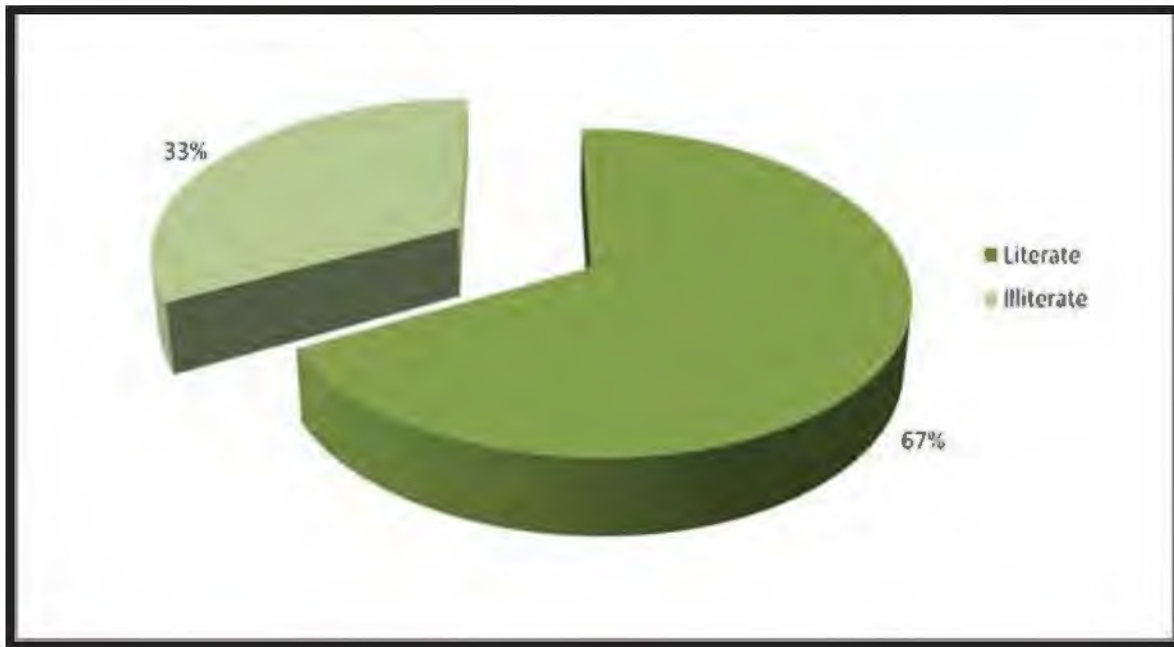
### 4.1.3 Literacy Rate

Status of literacy in villages falling under core zone, buffer zone-I and II of REGL is presented in Figure 4.8. It shows that in core zone villages 76.01% of the population are literates. Whereas in buffer zone-I villages, 77.05% are literates. Overall status of literacy in CSR zone is presented in Figure 4.9. It reveals that 75.74% of the population are literates. The village wise detail of status of literacy of CSR zone of REGL is presented in Annexure 4.3.

Status of gender wise literacy in CSR zone of REGL reveals that 86.04% are male literates of the total male population against 65.36% female literates of the total female population of CSR zone of REGL. Similarly, in core zone 87.11% are male literates of the total male population against 64.52% female literates of the total female population.

**Figure 4.8: Status of Literacy in REGL-CSR Zone Villages**



**Figure 4.9: Overall Status of Literacy in REGL-CSR Zone**

## 4.2 OCCUPATIONAL PATTERN IN CSR ZONE

Status of workers in villages falling under core zone, buffer zone-I and II of REGL is presented in Annexure 4.4. It shows that out of total working population, 62.48% are main workers and remaining 37.52% are marginal workers in project region. Figure 4.10 shows that 30.36% are main workers of the total population, 18.23% are marginal workers and remaining more than 50% are non-workers of the total population. Similarly, in core zone 33.25% are main workers, 4.64% are marginal workers and remaining more than 60% are non-workers of the total population. Whereas in buffer zone-II, main workers are 30.58% against 20.21% marginal workers and 49.21% non-workers of the total population. Overall status of workers in CSR zone is presented in Figure 4.11. It reveals that 48.59% are working population and remaining 51.41% of the total population are non-workers in the CSR zone of REGL.

Detail of main workers of villages falling under core zone, buffer zone-I and II of REGL is presented in Annexure 4.5. Out of total main workers in core zone, majority (31.79%) are cultivators followed by agricultural labour (24.60%). Similarly, in buffer zone-I, majority (51.61%) are cultivators followed by agricultural labour (28.24%) (Figure 4.12). Overall status of main workers in CSR zone is presented in Figure 4.13. It reveals that 32.36% are cultivators, 49.75% are agricultural labours, 1.62% are engaged in household industries and remaining 16.27% of the total main workers are other workers in the CSR zone of REGL.



Detail of marginal workers of villages falling under core zone, buffer zone-I and II of REGL is presented in Annexure 4.6. Out of total marginal workers in core zone, majority (83.85%) are agricultural labour followed by cultivators (5.38%). Similarly, in buffer zone-I, majority (71.90%) are agricultural labour followed by cultivators (9.24%) (Figure 4.14). Overall status of marginal workers in CSR zone is presented in Figure 4.20. It reveals that majority (68.22%) are agricultural labours followed by cultivators (20.59%) of the total marginal workers in the CSR zone of REGL.

**Figure 4.10: Status of Workers in REGL-CSR Zone Villages**

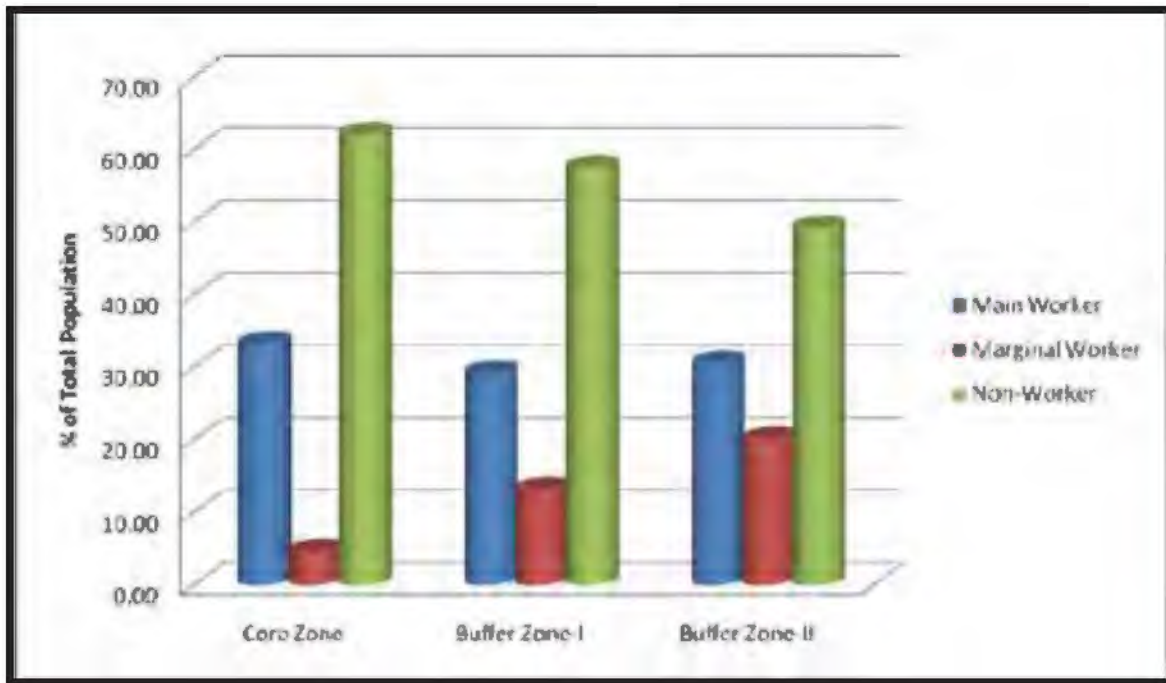


Figure 4.11: Overall Status of Workers in REGL-CSR Zone

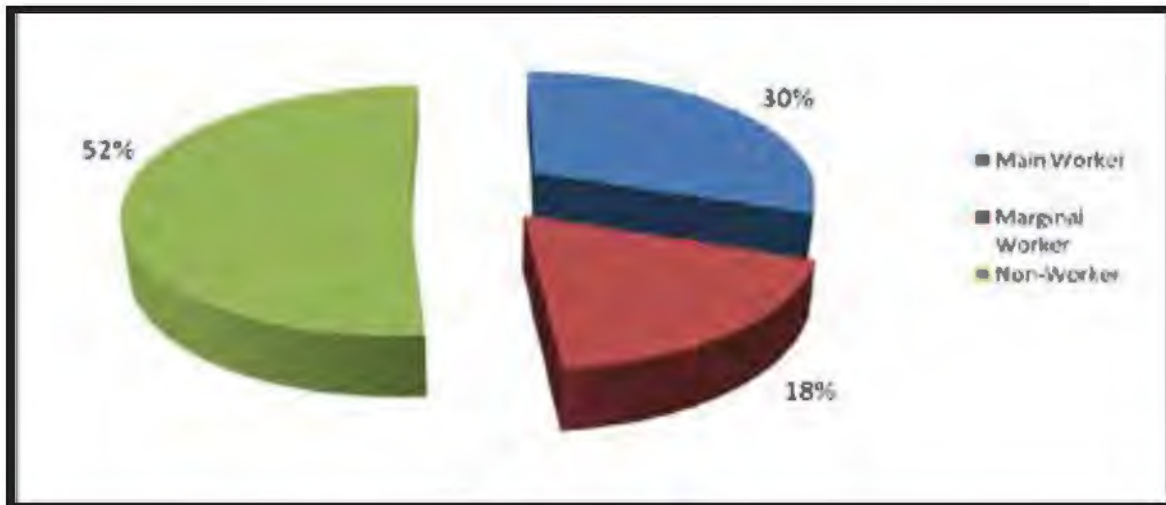


Figure 4.12: Detail of Main Workers in REGL-CSR Zone

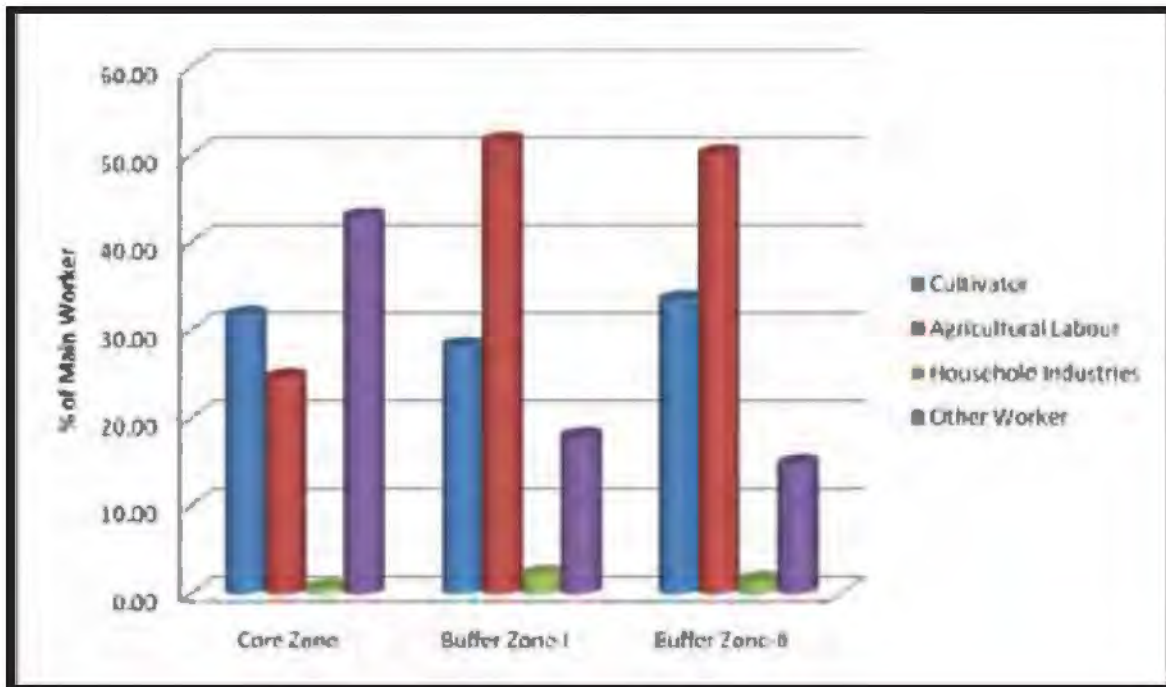


Figure 4.13: Overall Status of Main Workers in REGL-CSR Zone

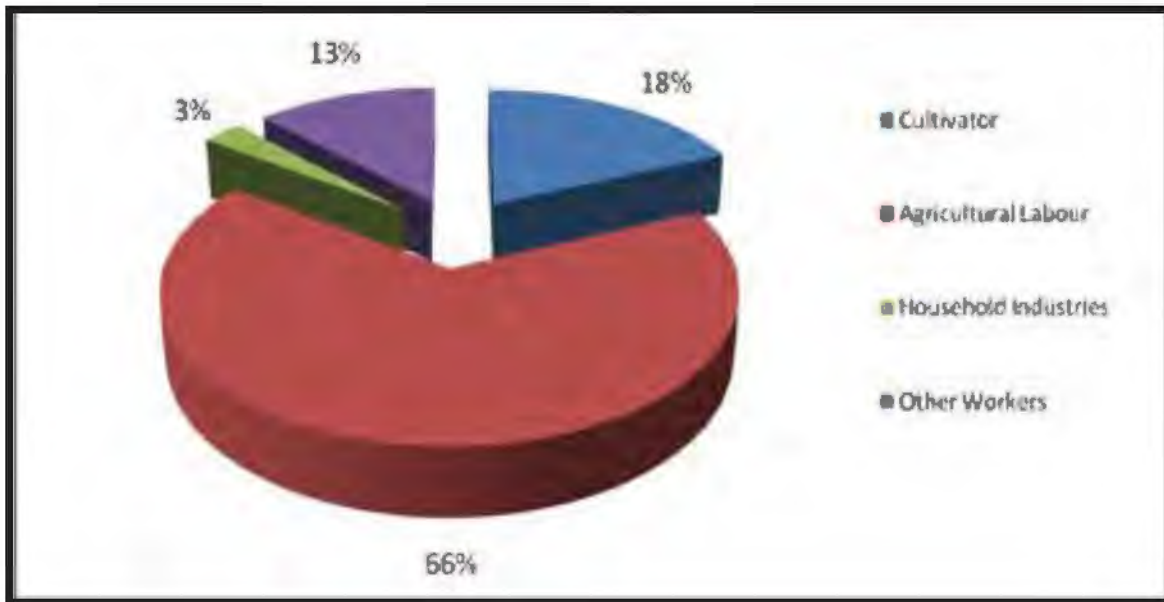
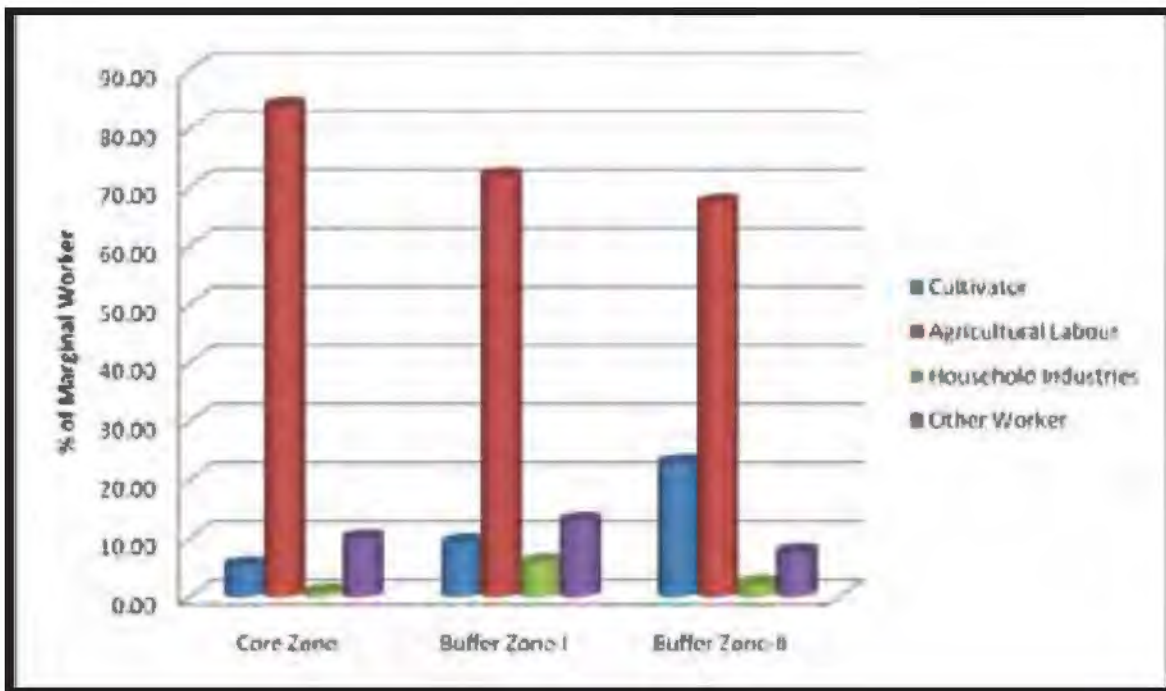
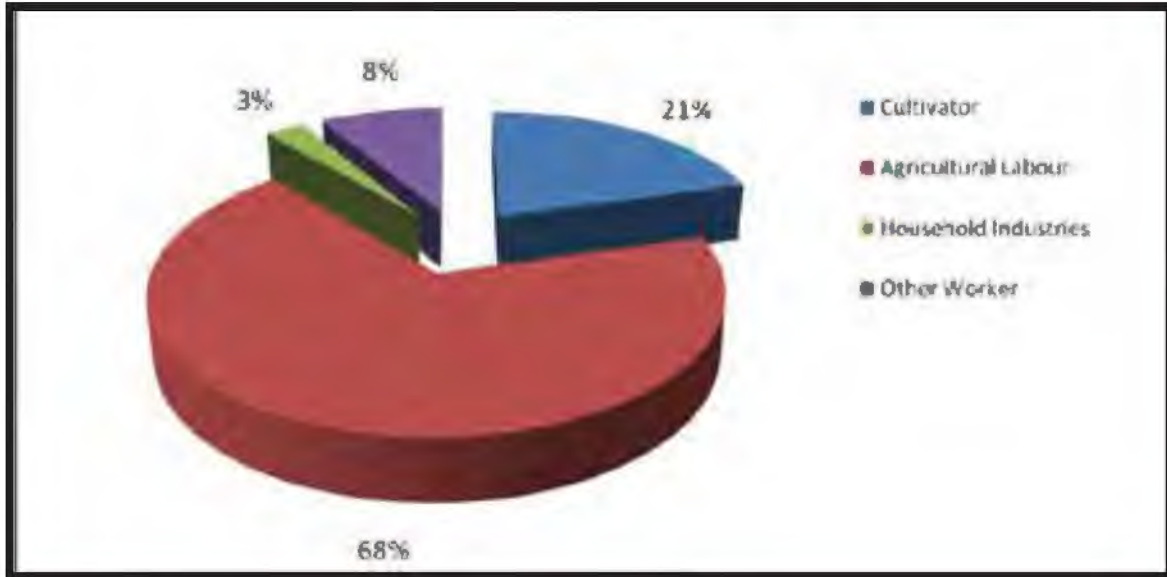


Figure 4.14: Detail of Marginal Workers in REGL-CSR Zone

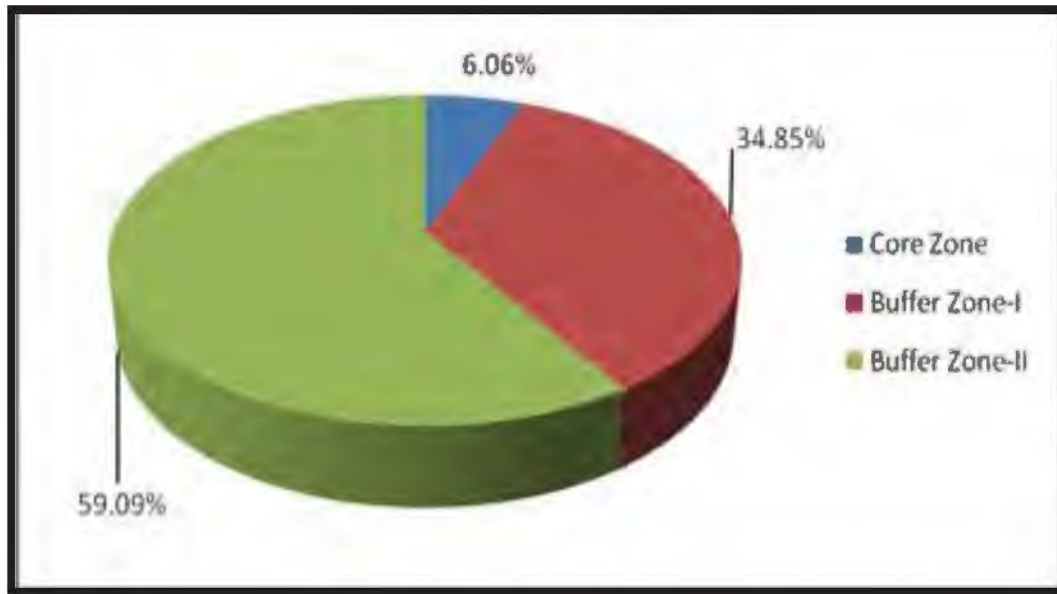


**Figure 4.15: Overall Status of Marginal Workers in REGL-CSR Zone**

### 4.3 BASIC AMENITIES & INFRASTRUCTURE DEVELOPMENT IN CSR ZONE

For assessing the existing status of basic amenities and infrastructure development viz., educational facilities, drinking water, health and sanitation facilities, road and communication facilities, agricultural development facilities, skill development, etc., field survey was conducted in the 66 CSR villages falling under 3 Blocks, namely Pusour and Raigarh Blocks of Raigarh district and Dabhra Block of Jajgir-Champa district under Chattisgarh State. Zone wise distribution of surveyed CSR villages is presented in Figure 4.16. Out of total surveyed households, 6.06% are from core zone, 34.85% from Buffer zone- and remaining 59.09% from Buffer zone-II.



**Figure 4.16: Zone-Wise Distribution of Surveyed CSR Villages**

#### 4.3.1 EDUCATIONAL FACILITIES

Educational facilities are one of the basic needs to uplift the quality of life of local people in the villages. Availability of educational facilities can be measured in terms of educational institutions available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest educational institutions.

##### Primary School

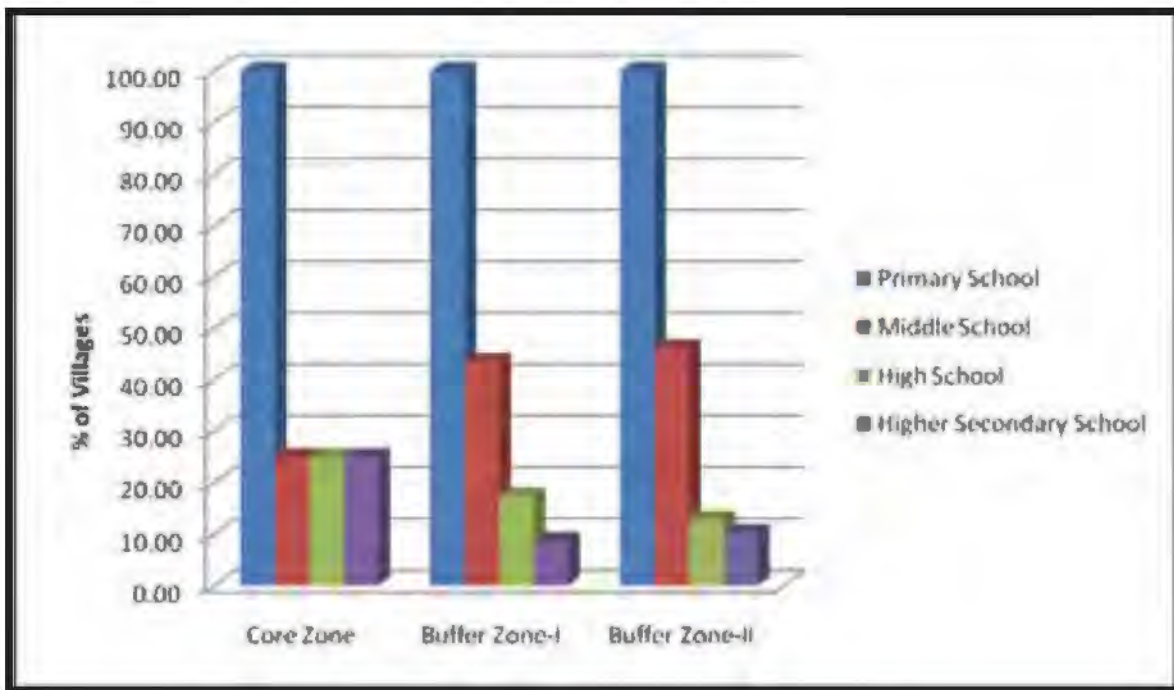
Zone wise detail of availability of Primary School (I to IV) in surveyed CSR villages is presented in the Table 4.1. The availability of Primary School in surveyed CSR villages is presented in Figure 4.17. The analysis reveals that all of the surveyed CSR villages in core zone, Buffer zone-I & II are having Primary School.



**TABLE 4.1: AVAILABILITY OF PRIMARY SCHOOLS IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having Primary Schools	
		Yes	No
1	Core Zone	100.00	-
2	Buffer Zone-I	100.00	-
3	Buffer Zone-II	100.00	-
	<b>Total</b>	<b>100.00</b>	<b>-</b>

**Figure 4.17: Availability of Primary/Middle/High/HS School within CSR Villages**





## Middle School

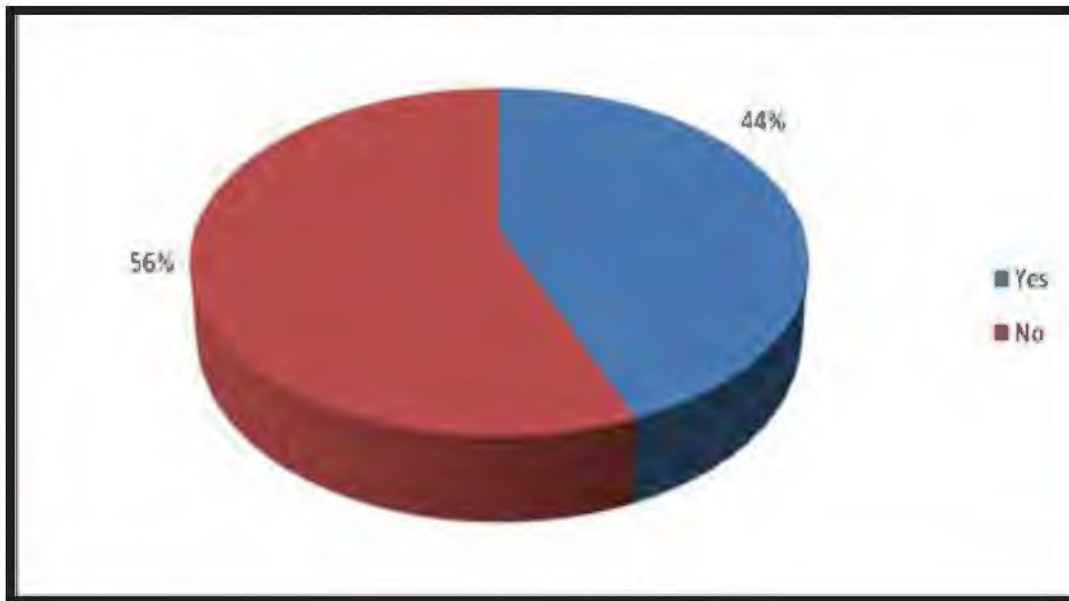
Zone wise detail of availability of Middle School (V to VIII) in surveyed CSR villages is presented in the Table 4.2. The analysis reveals that out of the 4 surveyed CSR villages in core zone, only one village, namely Bade Bhandar village is having Middle School. Students of Amlı Bhouna village under Pusour Block in core zone are to travel minimum 500 m distance to avail the facility of Middle School education, which is located at Kathali.

Out of 23 surveyed CSR villages in Buffer Zone-I, 10 villages are having Middle School. Students of Tupakdhar village under Pusour Block are to travel minimum 1 km distance to avail the facility of Middle School education, which is located at Kathali. Out of 39 surveyed CSR villages in Buffer zone-II, 18 villages are having Middle School. Students of Raipali, Tekka, Raitarai and Jampali villages under Pusour Block are to travel minimum 1 km distance to avail the facility of Middle School education, which is located at Nawapara, Gorra, Gulakai and Kurmapali respectively.

Overall analysis of availability of Middle schools shows that out of 66 surveyed CSR villages 29 villages are having Middle School (Figure 4.18). Distance of nearest Middle School from the villages not having Middle School ranges between 500 m to 7 km. Students of Amlı Bhouna village under Pusour Block are to travel minimum 500 m distance to avail the facility of Middle School education, which is located at Kathali, whereas students of Basanpali village under Pusour Block are to travel minimum 7 km distance to avail the facility of Middle School education, which is located at Tetla.

**TABLE 4.2: AVAILABILITY OF MIDDLE SCHOOLS IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having Middle Schools		If No, Distance (m)		
		Yes	No	< 500	500-1000	> 1000
1	Core Zone	25.00	75.00	-	66.67	33.33
2	Buffer Zone-I	43.48	56.52	-	7.69	92.31
3	Buffer Zone-II	46.15	53.85	-	20.00	80.00
	<b>Total</b>	<b>43.94</b>	<b>56.06</b>	<b>-</b>	<b>19.44</b>	<b>80.56</b>

**Figure 4.18: Overall Availability of Middle Schools in CSR Villages**

### High School

Zone wise detail of availability of High School (IX to X) in surveyed CSR villages is presented in the Table 4.3. The analysis reveals that out of the 4 surveyed CSR villages in core zone, only one village, namely Bade Bhandar village under Pusour Block is having High School. Students of Chhote Bhandar village under Pusour Block in core zone are to travel minimum 1 km distance to avail the facility of High School education, which is located at Bade Bhandar.

Out of 23 surveyed CSR villages in Buffer Zone-I, only 4 villages, namely Supa, Jatri and Bunga villages under Pusour Block and Chandli village under Dabhra Block are having High School. Students of Jeveridih and Barpali villages under Pusour Block are to travel minimum 2 km distance to avail the facility of High School education, which is located at Bade Bhandar. Whereas students of Bhirha Bhatha village under Dabhra Block are to travel minimum 2 km distance to avail the facility of High School education, which is located at Jatri. Out of 39 surveyed CSR villages in Buffer zone-II, 5 villages are having High School. Students of Tekka village under Pusour Block are to travel minimum 1 km distance to avail the facility of High School education, which is located at Gorra.

Overall analysis of availability of High schools shows that out of 66 surveyed CSR villages 10 villages are having High School (Figure 4.19). Distance of nearest High School from the villages not having High School ranges between 1 to 8 km. Students of Chhote Bhandar and Tekka villages under Pusour Block are to travel minimum 1 km distance to avail the facility of High School

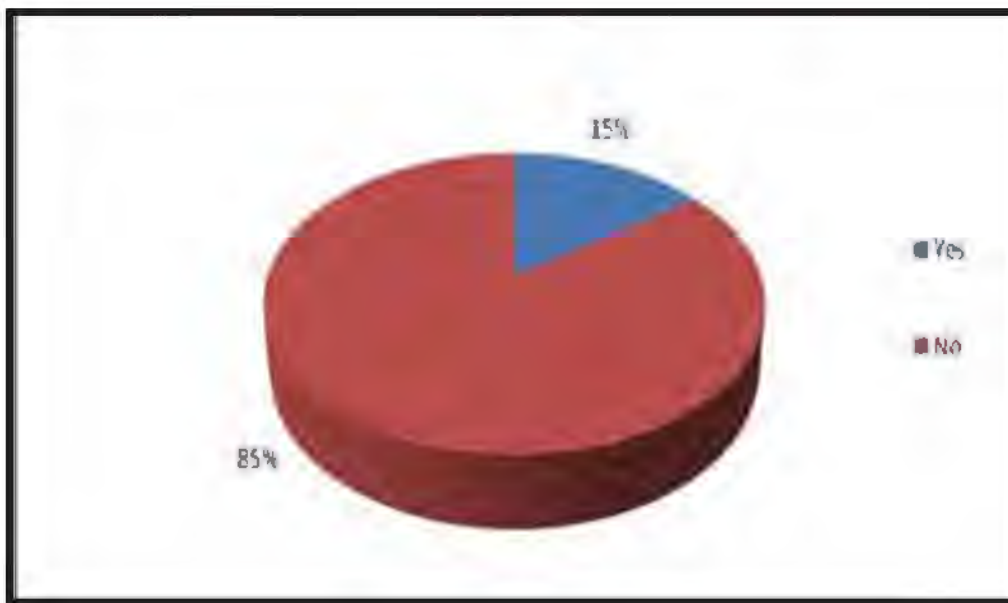


education, which is located at Bade Bhandar and Gorra respectively, whereas students of Siha village under Pusour Block are to travel minimum 8 km distance to avail the facility of High School education, which is located at Pusour.

**TABLE 4.3: AVAILABILITY OF HIGH SCHOOLS IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having High Schools		If No, Distance (km)			
		Yes	No	< 1	1-5	5-10	>10
1	Core Zone	25.00	75.00	-	100.00	-	-
2	Buffer Zone-I	17.39	82.61	-	94.74	5.26	-
3	Buffer Zone-II	12.82	87.18	-	78.13	21.88	-
	<b>Total</b>	<b>15.15</b>	<b>84.85</b>	<b>-</b>	<b>85.19</b>	<b>14.81</b>	<b>-</b>

**Figure 4.19: Overall Availability of High Schools in CSR Villages**



## Higher Secondary School

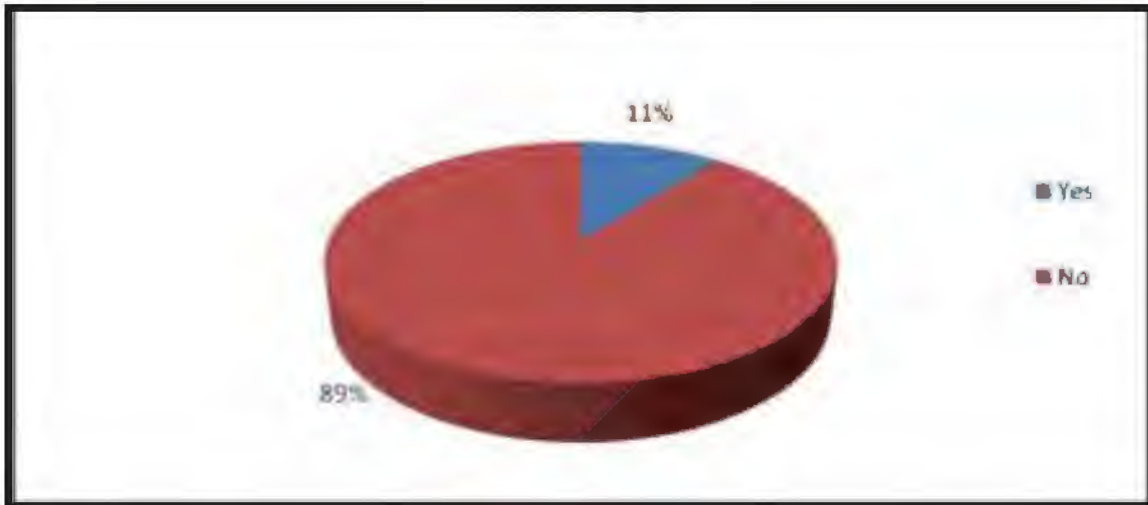
Zone wise detail of availability of Higher Secondary School (XI to XII) in surveyed CSR villages is presented in the Table 4.4. The analysis reveals that out of 4 surveyed CSR villages in core zone, only one village, namely Bade Bhandar village is having Higher Secondary School. Students of Chhote Bhandar village under Pusour Block in core zone are to travel minimum 1 km distance to avail the facility of Higher Secondary School education, which is located at Bade Bhandar.

Out of 23 surveyed CSR villages in Buffer Zone-I, only 2 villages, namely Jatri under Pusour Block and Chandli village under Dabhra Block are having Higher Secondary School. Students of Jeveridih and Barpali villages under Pusour Block are to travel minimum 2 km distance to avail the facility of Higher Secondary School education, which is located at Bade Bhandar. Whereas students of Bhirha Bhatha village under Dabhra Block are to travel minimum 2 km distance to avail the facility of Higher Secondary School education, which is located at Jatri. Out of the 39 surveyed CSR villages in Buffer zone-II, only 4 villages are having Higher Secondary School. Students of Kurmapali and Tekka villages under Pusour Block are to travel minimum 1 km distance to avail the facility of Higher Secondary School education, which is located at Gorra.

Overall analysis of availability of Higher Secondary schools shows that out of 66 surveyed CSR villages only 7 villages are having Higher Secondary School (Figure 4.20). Distance of nearest Higher Secondary School from the villages not having Higher Secondary School ranges between 1 to 7 km. Students of Chhote Bhandar, Kurmapali and Tekka villages under Pusour Block are to travel minimum 1 km distance to avail the facility of Higher Secondary School education, which is located at Bade Bhandar, Gorra, whereas students of Lankapali and Basanpali villages under Pusour Block are to travel minimum 7 km distance to avail the facility of Higher Secondary School education, which is located at Tetla.

**TABLE 4.4: AVAILABILITY OF HIGHER SECONDARY SCHOOLS IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having Higher Secondary Schools		If No, Distance (km)			
		Yes	No	< 1	1-5	5-10	>10
1	Core Zone	25.00	75.00	-	100.00	-	-
2	Buffer Zone-I	8.70	91.30	-	95.00	5.00	-
3	Buffer Zone-II	10.26	89.74	-	75.76	24.24	-
	<b>Total</b>	<b>10.61</b>	<b>89.39</b>	-	<b>83.93</b>	<b>16.07</b>	-

**Figure 4.20: Overall Availability of Higher Secondary Schools in CSR Villages**

### Degree College

Zone wise detail of availability of Degree college in surveyed CSR villages is presented in the Table 4.5. The analysis reveals that none of the 4 surveyed CSR villages in core zone is having Degree college. Students of Bade Bhandar village under Pusour Block in core zone are to travel minimum 13 km distance to avail the facility of Degree college education, which is located at kundatarai (Mahamangala College).

None of 23 surveyed CSR villages in Buffer zone-I is having Degree college. Students of Bonda village under Pusour Block are to travel minimum 2 km distance to avail the facility of Degree college education, which is located at Umriangoan. None of the surveyed CSR villages in Buffer Zone-II is having Degree college. Students of Tekka village under Pusour Block are to travel minimum 2 km distance to avail the facility of Degree college education, which is located at Raighar.

Overall analysis of availability of Degree college shows that none of 66 surveyed CSR villages is having Degree college. Distance of nearest degree college from the villages ranges between 2 to 40 km. Students of Bonda and Tekka villages under Pusour Block are to travel minimum 2 km distance to avail the facility of Degree college education, which is located at Umriangoan, Raighar, whereas students of Mahadevpali village under Dabhra Block are to travel minimum 40 km distance to avail the facility of Degree college education, which is located at Raighar.



**TABLE 4.5: AVAILABILITY OF DEGREE COLLEGES IN SURVEYED CSR VILLAGES**

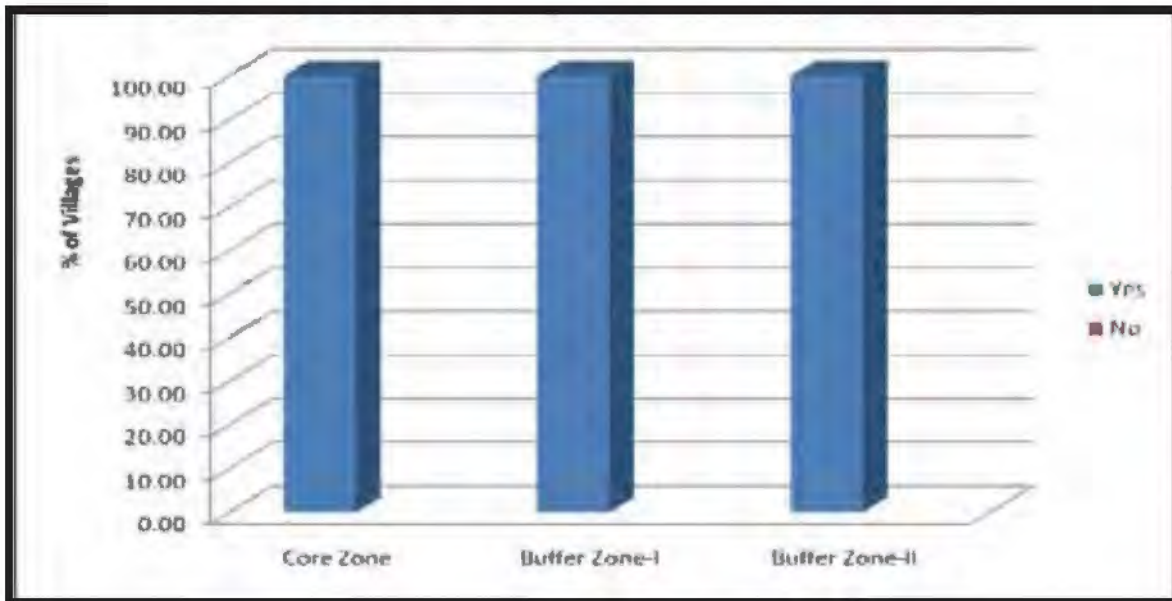
Sl. No.	Zone	No. of surveyed CSR Villages Having Degree Colleges		If No, Distance (km)			
		Yes	No	< 5	5-10	10-40	>40
1	Core Zone	-	100.00	-	-	100.00	-
2	Buffer Zone-I	-	100.00	9.52	4.76	85.71	-
3	Buffer Zone-II	-	100.00	5.71	2.86	91.43	-
	<b>Total</b>	-	<b>100.00</b>	<b>6.67</b>	<b>3.33</b>	<b>90.00</b>	-

### Anganwadi Centre

Zone wise detail of availability of anganwadi centre in surveyed CSR villages is presented in the Table 4.6. The availability of anganwadi centre in surveyed CSR villages is presented in Figure 4.21. The analysis reveals that all of the surveyed CSR villages are having anganwadi centre.

**TABLE 4.6: AVAILABILITY OF ANGANWADI CENTRES IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having Anganwadi Centre	
		Yes	No
1	Core Zone	100.00	-
2	Buffer Zone-I	100.00	-
3	Buffer Zone-II	100.00	-
	<b>Total</b>	<b>100.00</b>	-

**FIGURE 4.21: AVAILABILITY OF ANGANWADI CENTRE WITHIN CSR VILLAGES**

### 4.3.2 HEALTH FACILITIES

Health facilities are one of the basic needs to uplift the quality of life of local people in the villages. Availability of health facilities can be measured in terms of PHCs/Sub-centre available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest PHCs/Sub-centre, private doctor available in CSR villages and if they are not available within CSR villages, minimum distance to travel to the nearest private doctor, medicine shop available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest medicine shop, pathological centre available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest pathological centre.

#### Primary Health Centre/Sub-Centre

Zone wise detail of availability of PHC/Sub-Centre in surveyed CSR villages is presented in the Table 4.7. The availability of PHC/Sub-Centre in surveyed CSR villages is presented in Figure 4.22. The analysis reveals that out of 4 surveyed CSR villages in core zone, only one CSR village, namely Bade Bhandar village under Pusour Block are having PHC/Sub-centre. Distance of nearest PHC/Sub-Centre from the remaining villages ranges between 1 to 3.5 km. Patients of Chhote Bhandar village under Pusour Block are to travel minimum 1 km distance to avail the facility of PHC/Sub-centre, which is located at Bade Bhandar, whereas patients of Amli Bhouna village



under Pusour Block are to travel minimum 3.5 km distance to avail the facility of PHC/Sub-centre, which is located at Bade Bhandar.

Out of 23 surveyed CSR villages in Buffer Zone-I, only 2 villages are having PHC/Sub-centre. Distance of nearest PHC/Sub-Centre from the remaining villages ranges between 1 to 8 km. Patients of Tilgi village under Pusour Block are to travel minimum 1 km distance to avail the facility of PHC/Sub-centre, which is located at Babe Bhandar, whereas patients of Siha village under Pusour Block are to travel minimum 8 km distance to avail the facility of PHC/Sub-centre, which is located at Pusour. Out of 39 surveyed CSR villages in Buffer zone-II, only 3 villages are having PHC/Sub-centre. Distance of nearest PHC/Sub-Centre from the remaining villages ranges between 2 to 13 km. Patients of Bulaki and Raitarai villages under Pusour Block are to travel minimum 2 km distance to avail the facility of PHC/Sub-centre, which is located at Putkapuri, whereas patients of Thakurpali village under Raigarh Block are to travel minimum 2 km distance to avail the facility of PHC/Sub-centre, which is located at Tarapur.

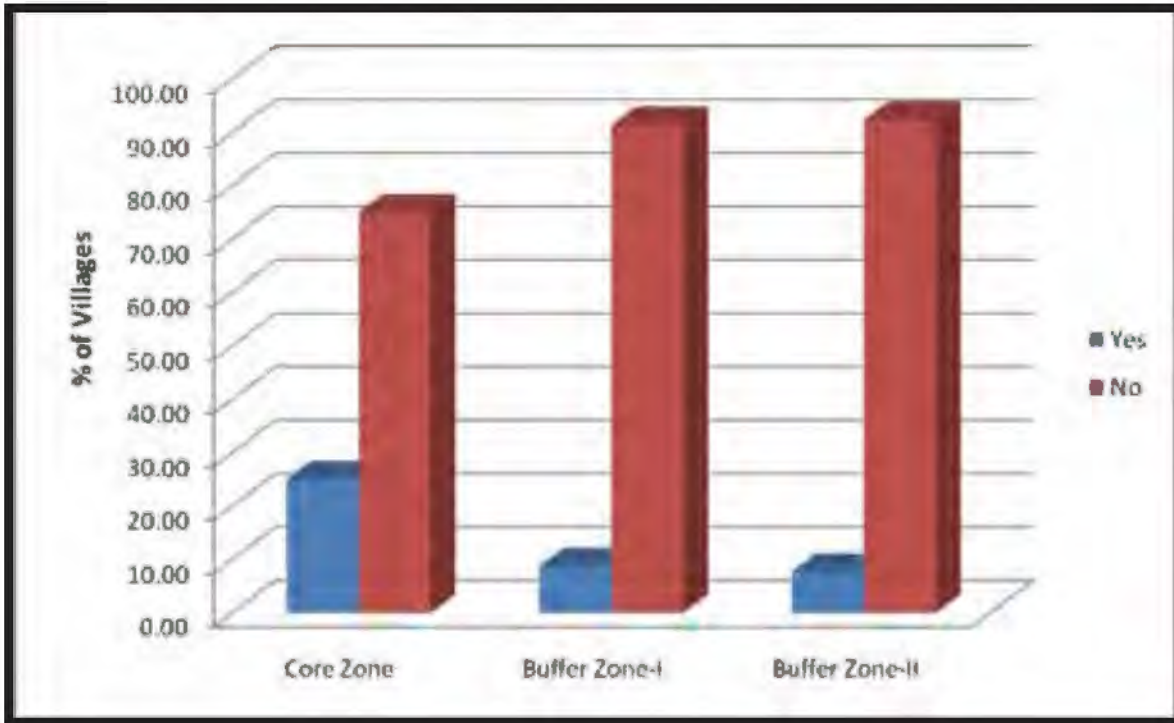
Overall analysis of availability of PHC/Sub-centre shows that out of 66 surveyed CSR villages, only 6 villages have PHC/Sub-centre (Figure 4.23). Out of the remaining villages where PHC/Sub-centre is not available, 62.71% of the patients are to travel less than 5 km distance to avail such facility, whereas in case of 32.20% of the villages patients are to travel 5 - 10 km distance to avail such facility.

**TABLE 4.7: AVAILABILITY OF PHC/SUB-CENTRE IN SURVEYED CSR VILLAGES**

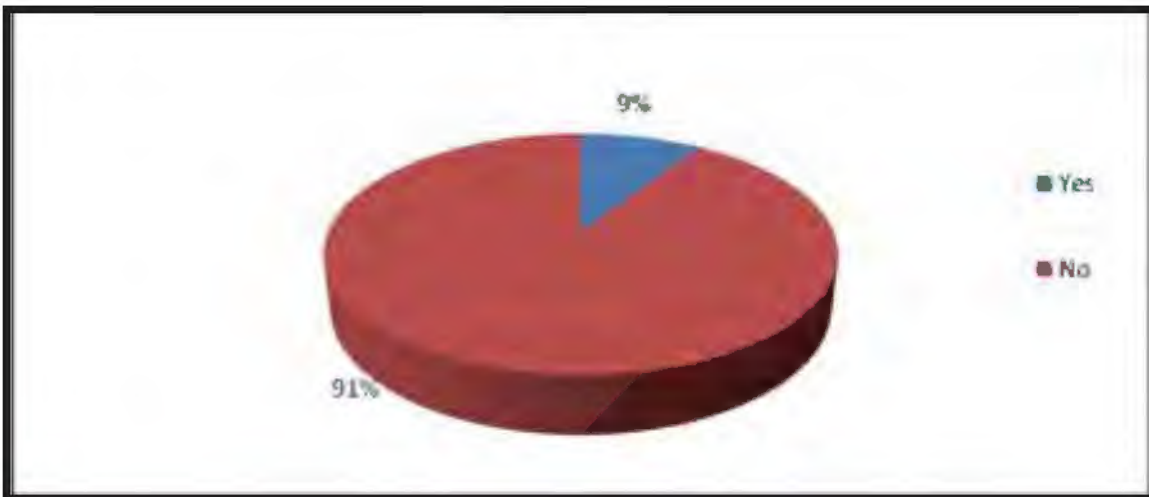
Sl. No.	Zone	No. of surveyed CSR Villages Having PHC/Sub-Centre		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	25.00	75.00	100.00	-	-	-
2	Buffer Zone-I	8.70	91.30	61.90	38.10	-	-
3	Buffer Zone-II	7.69	92.31	60.00	31.43	8.57	-
	<b>Total</b>	<b>9.09</b>	<b>90.91</b>	<b>62.71</b>	<b>32.20</b>	<b>5.08</b>	<b>-</b>



**FIGURE 4.22: AVAILABILITY OF PRIMARY HEALTH CENTRE IN CSR VILLAGES**



**FIGURE 4.23: OVERALL AVAILABILITY OF PHC/SUB-CENTRE IN CSR VILLAGES**



### Private Doctor

Zone wise detail of availability of private doctor in surveyed CSR villages is presented in the Table 4.8. The availability of private doctor in surveyed CSR villages is presented in Figure 4.24. The analysis reveals that none of 4 surveyed CSR villages in core zone is having private doctor. Patients of these villages are to travel distances ranging from 1 to 13 km. Patients of Sarvani village under Pusour Block are to travel minimum 1 km distance to avail the facility of private doctor, which is located at Birabhata, whereas patients of Bade Bhandar village under Pusour Block are to travel minimum 13 km distance to avail the facility of private doctor, which is located at Tilgee.

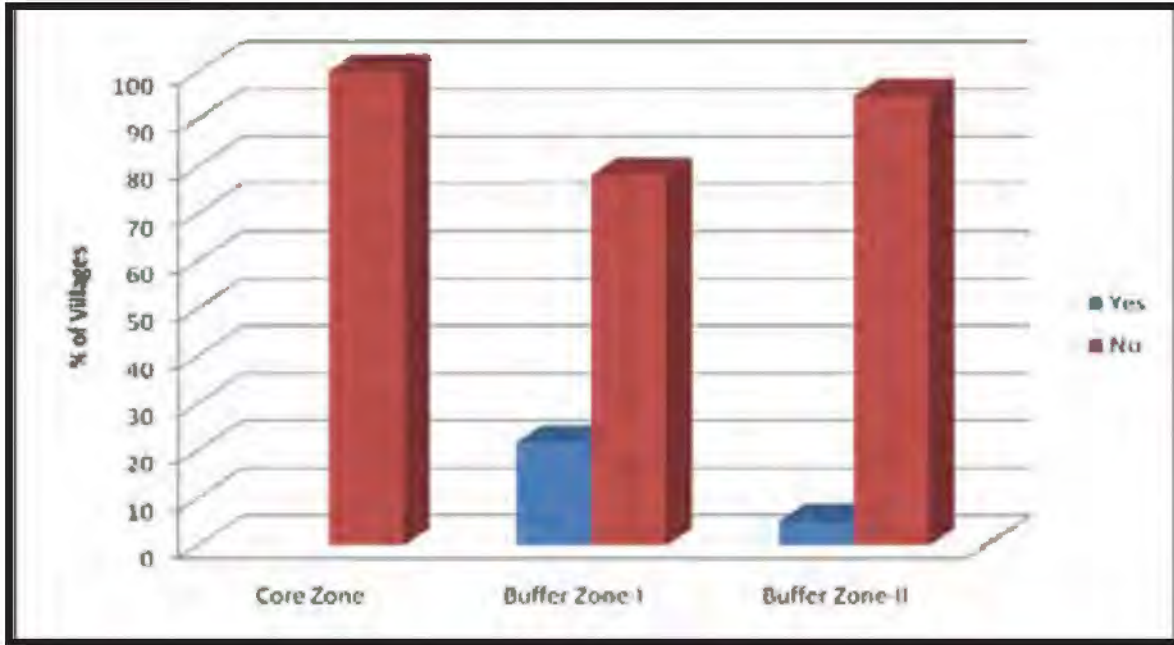
Out of 23 surveyed CSR villages in Buffer Zone-I, only 5 villages are having private doctor. Patients of Karichhapar and Raibar villages under Pusour Block are to travel minimum 2 km distance to avail the facility of private doctor, which is located at Tilgi. Out of 39 surveyed CSR villages in Buffer zone-II, only 2 villages, namely Chichor Umariya and Putkapuri are having private doctor. Patients of Raitarai and Jampali villages under Pusour Block are to travel minimum 2 km distance to avail the facility of private doctor, which is located at Putkapuri, Goora.

Overall analysis of availability of PHC/Sub-centre shows that out of 66 surveyed CSR villages, only 7 villages have private doctor (Figure 4.25). Out of the remaining villages where private doctor is not available, 53.57% of the patients are to travel less than 5 km distance to avail such facility, whereas in case of 17.86% of the villages patients are to travel more than 10 km distance to avail such facility.

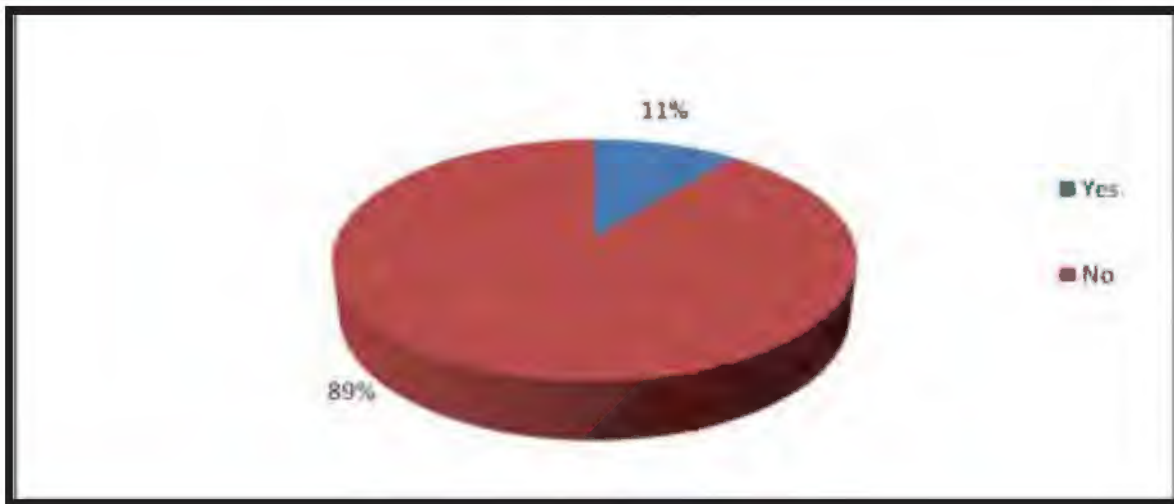
**TABLE 4.8: AVAILABILITY OF PRIVATE DOCTOR IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having Private Doctor		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	-	100.00	75.00	-	25.00	-
2	Buffer Zone-I	21.74	78.26	66.67	22.22	11.11	-
3	Buffer Zone-II	5.13	94.87	44.12	35.29	20.59	-
	<b>Total</b>	<b>10.61</b>	<b>89.39</b>	<b>53.57</b>	<b>28.57</b>	<b>17.86</b>	<b>-</b>

**FIGURE 4.24: AVAILABILITY OF PRIVATE DOCTOR WITHIN CSR VILLAGES**



**FIGURE 4.25: OVERALL AVAILABILITY OF PRIVATE DOCTOR IN CSR VILLAGES**



## Medicine Shop

Zone wise detail of availability of medicine shop in surveyed CSR villages is presented in the Table 4.9. The availability of medicine shop in surveyed CSR villages is presented in Figure 4.26. The analysis reveals that out of 4 surveyed CSR villages in core zone, only one village, namely Bade Bhandar is having medicine shop. Distance of nearest medicine shop from the remaining villages ranges between 500 m to 3 km. People of Amla Bhouna village under Pusour Block are to travel minimum 500 m distance to avail the facility of medicine shop, which is located at Kathali, whereas people of Sarvani village under Pusour Block are to travel minimum 3 km distance to avail the facility of medicine shop, which is located at Bade Bhandar.

Out of 23 surveyed CSR villages in buffer Zone-I, only 4 villages are having medicine shop. Distance of nearest medicine shop from the remaining villages ranges between 2 to 15 km. People of Jeveridih, Barpali, Semra and Raibar villages under Pusour Block are to travel minimum 2 km distance to avail the facility of medicine shop, which is located at Bade Bhandar, Supa, Jatri and Chikli, whereas people of Sankarpali village under Pusour Block are to travel minimum 15 km distance to avail the facility of medicine shop, which is located at Chikli. Out of 39 surveyed CSR villages in Buffer zone-II, only 2 villages, namely Chichor Umariya and Putkapuri villages under Pusour Block are having medicine shop. People of Bulaki and Raitarai villages under Pusour Block are to travel minimum 2 km distance to avail the facility of medicine shop, which is located at Putkapuri, whereas people of Thakurpali village under Raigarh Block are to travel minimum 2 km distance to avail the facility of medicine shop, which is located at Tarapur.

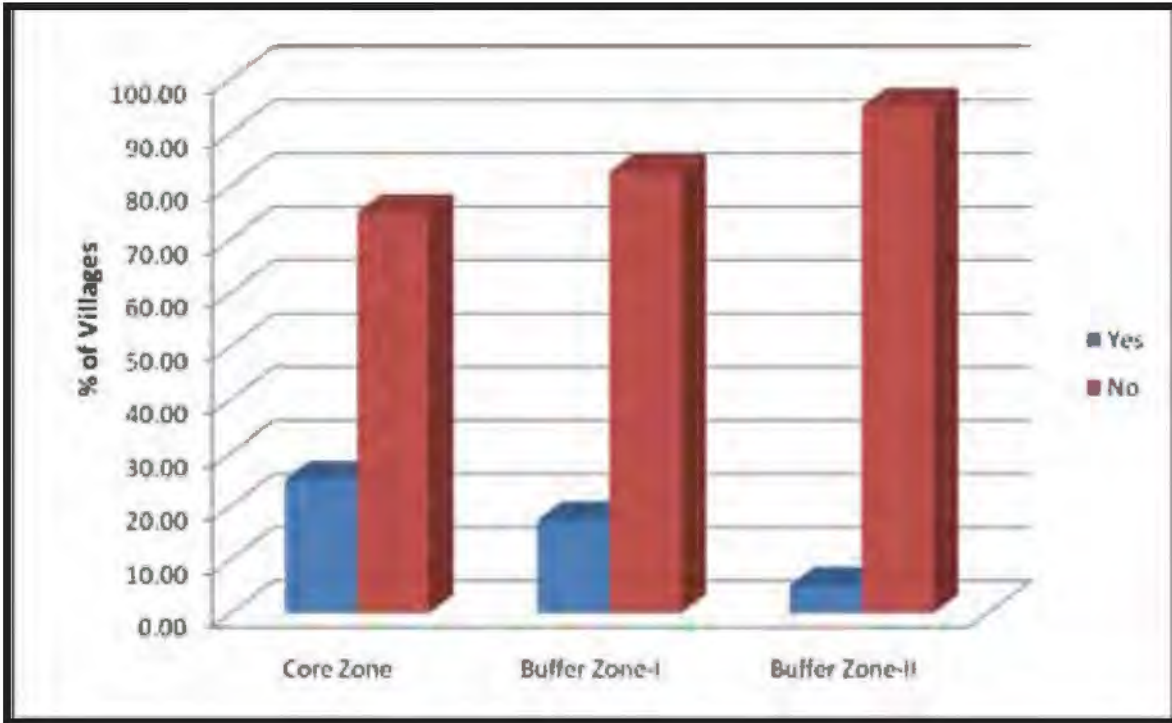
Overall analysis of availability of medicine shop shows that out of 66 surveyed CSR villages, only 7 villages have medicine shop (Figure 4.27). Out of the remaining villages, in case of 29.09% of the villages, people are to travel 5-10 km distance to avail such facility, whereas in case of 7.27% of the villages people are to travel more than 10 km distance to avail such facility.

**TABLE 4.9: AVAILABILITY OF MEDICINE SHOP IN SURVEYED CSR VILLAGES**

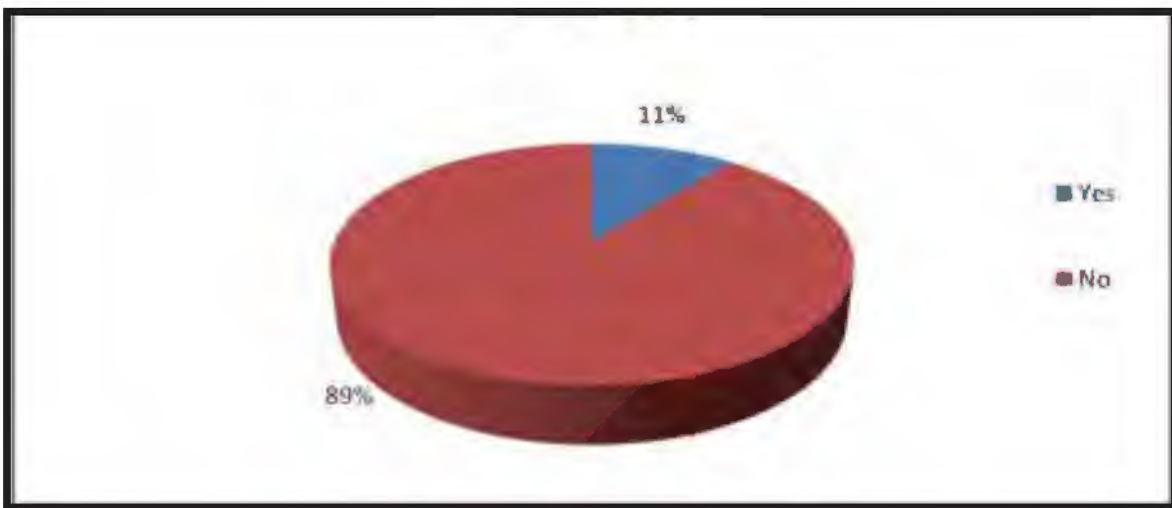
Sl. No.	Zone	No. of surveyed CSR Villages Having Medicine Shop		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	25.00	75.00	100.00	-	-	-
2	Buffer Zone-I	17.39	82.61	61.11	33.33	5.56	-
3	Buffer Zone-II	5.13	94.87	61.76	29.41	8.82	-
	<b>Total</b>	<b>10.61</b>	<b>89.39</b>	<b>63.64</b>	<b>29.09</b>	<b>7.27</b>	<b>-</b>



**FIGURE 4.26: AVAILABILITY OF MEDICINE SHOP WITHIN CSR VILLAGES**



**FIGURE 4.27: OVERALL AVAILABILITY OF MEDICINE SHOP IN CSR VILLAGES**



## Pathological Centre

Zone wise detail of availability of pathological centre in surveyed CSR villages is presented in the Table 4.10. The availability of pathological centre in surveyed CSR villages is presented in Figure 4.28. The analysis reveals that out of 4 surveyed CSR villages in core zone, only one village, namely, Bade Bhandar village is having pathological centre. Distance of nearest pathological centre from the remaining villages ranges between 1 to 3.5 km. People of Chhote Bhandar village under Pusour Block are to travel minimum 1 km distance to avail the facility of pathological centre, which is located at Bade Bhandar, whereas people of Amla Bhouna village under Pusour Block are to travel minimum 3.5 km distance to avail the facility of pathological centre, which is located at Bade Bhandar.

Out of 23 surveyed CSR villages in buffer zone-I, only 2 villages, namely Kotmara and Tilgi are having pathological centre. Distance of nearest pathological centre from the remaining villages ranges between 2 to 20 km. People of Jeveridih and Barpali villages under Pusour Block are to travel minimum 2 km distance to avail the facility of pathological centre, which is located at kathali, Bade Bhandar, whereas people of Amlipali and Karichhapar villages under Pusour Block are to travel minimum 20 km distance to avail the facility of pathological centre, which is located at Palhr, Raigarh. Out of 39 surveyed CSR villages in Buffer zone-II, only one village, namely, Putkapuri is having pathological centre. People of Tetla and Raitarai villages under Pusour Block are to travel minimum 2 km distance to avail the facility of pathological centre, which is located at Chikli, Putkapuri, whereas Thakurpali village under Raigarh Block are to travel minimum 2 km distance to avail the facility of pathological centre, which is located at Tarapur.

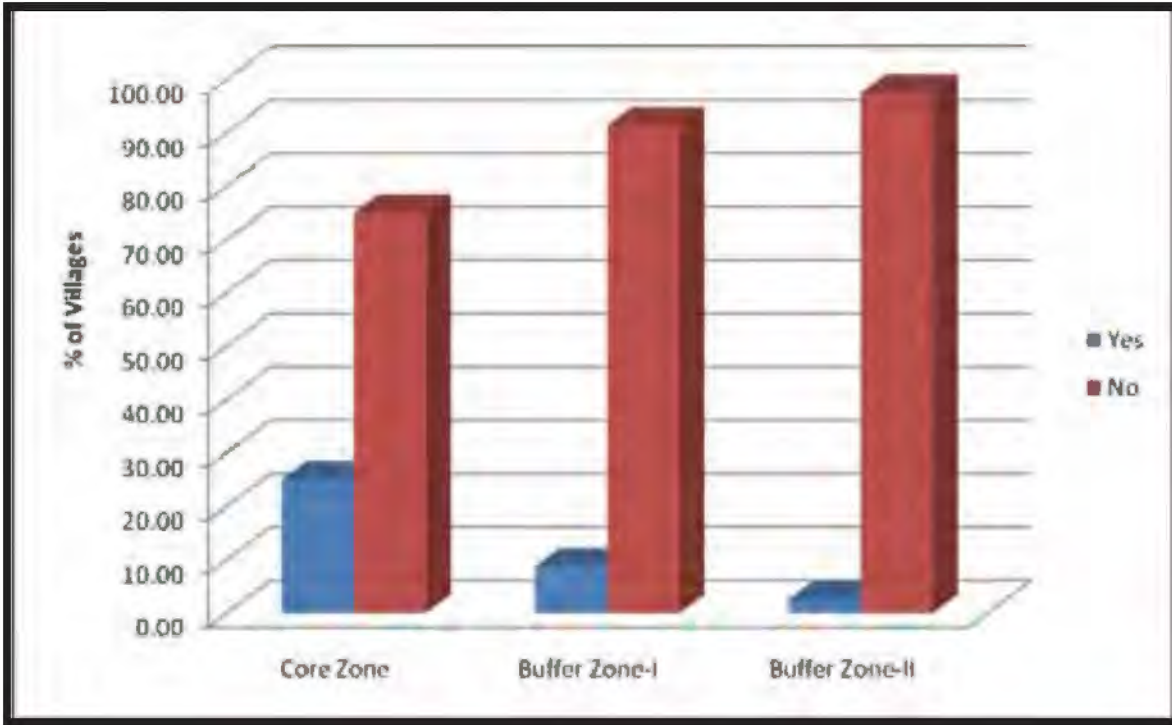
Overall analysis of availability of pathological centre shows that out of 66 surveyed CSR villages, only 3 villages have pathological centre (Figure 4.29). In case of 44.07% of the villages, people are to travel less than 5 km distance to avail such facility, whereas in case of 23.73% of the villages people are to travel more than 10 km distance to avail such facility.

**TABLE 4.10: AVAILABILITY OF PATHOLOGICAL CENTRE IN SURVEYED CSR VILLAGES**

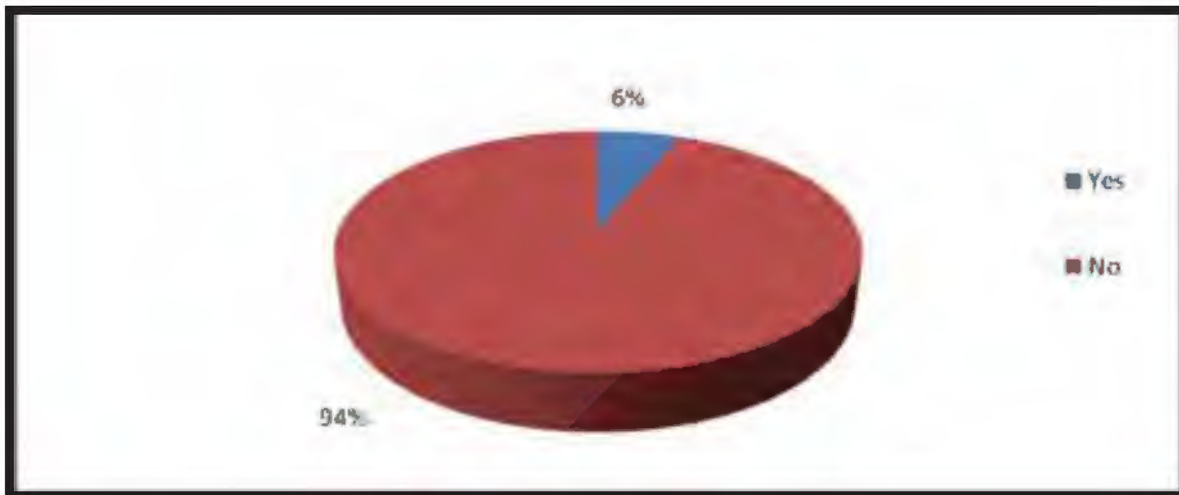
Sl. No.	Zone	No. of surveyed CSR Villages Having Pathological Centre		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	25.00	75.00	100.00	-	-	-
2	Buffer Zone-I	8.70	91.30	45.00	45.00	10.00	-
3	Buffer Zone-II	2.56	97.44	38.89	27.78	33.33	-
	<b>Total</b>	<b>6.06</b>	<b>93.94</b>	<b>44.07</b>	<b>32.20</b>	<b>23.73</b>	-



**FIGURE 4.28: AVAILABILITY OF PATHOLOGICAL CENTRE WITHIN CSR VILLAGES**



**FIGURE 4.29: OVERALL AVAILABILITY OF PATHOLOGICAL CENTRE IN CSR VILLAGES**



### 4.3.3 ROAD NETWORK

Strengthening of road network is one of the basic needs to uplift the quality of life of local people in the villages. Availability of road network facilities can be measured in terms of village connected by metalled road and if it is not connected, minimum distance to travel to the nearest metalled road.

Zone wise detail of connectivity of surveyed CSR villages by metalled road is presented in the Table 4.11. The connectivity of surveyed CSR villages by metalled road is presented in Figure 4.30. The analysis reveals that out of 4 surveyed CSR villages in core zone, 3 CSR villages are connected by metalled road. Sarvani village under Pusour Block is located approx. 2 km away from metalled road.

Out of 23 surveyed CSR villages in Buffer Zone-I, 21 CSR villages are connected by metalled road. Bonda village under Pusour Block are located approx. 1 km away from metalled road. Out of 39 surveyed CSR villages in Buffer zone-II, 37 CSR villages are connected by metalled road.

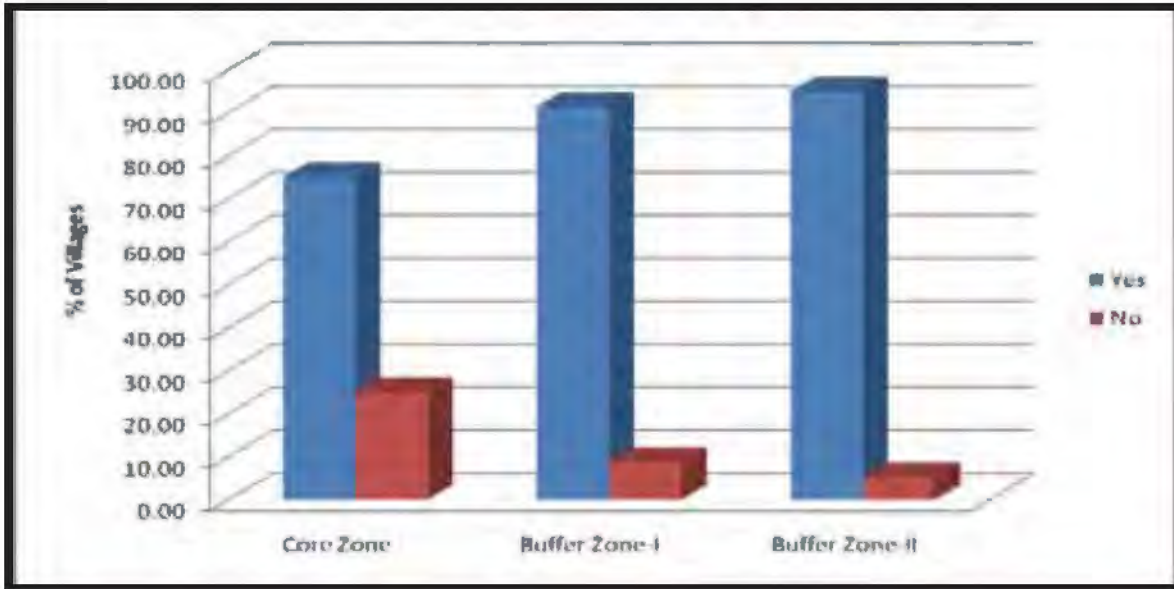
Overall analysis of connectivity of surveyed CSR villages by metalled road shows that out of 66 surveyed CSR villages, 61 villages are already connected by metalled road (Figure 4.31). Remaining villages which are not connected by metalled road, are located 1-5 km away from metalled road.

**TABLE 4.11: CONNECTIVITY OF SURVEYED CSR VILLAGES BY METALLED ROAD**

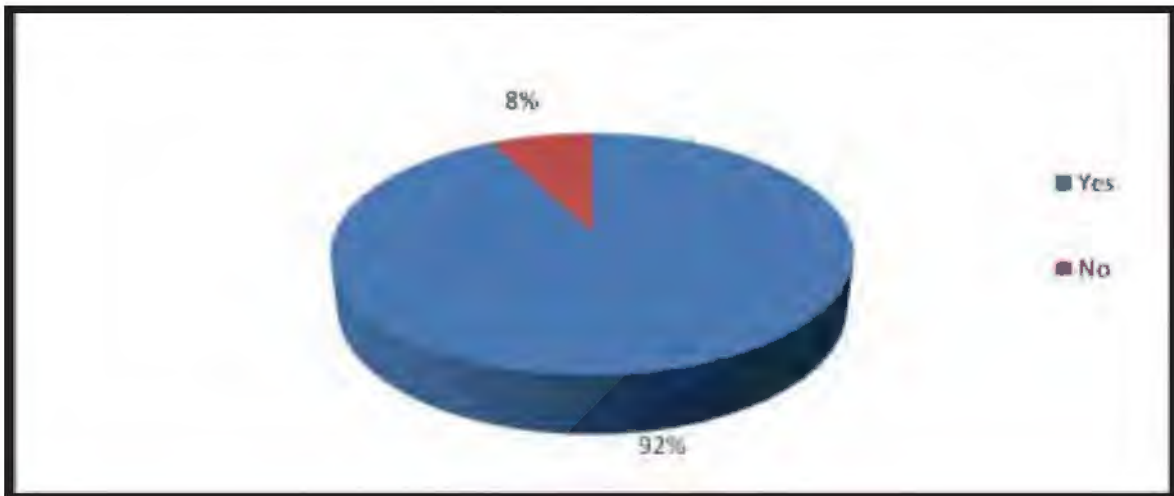
Sl. No.	Zone	No. of surveyed CSR Villages Connected by Metalled Road		If No, Distance (m)			
		Yes	No	< 500	500-1000	1000-5000	>5000
1	Core Zone	75.00	25.00	-	-	100.00	-
2	Buffer Zone-I	91.30	8.70	-	-	100.00	-
3	Buffer Zone-II	94.87	5.13	-	-	100.00	-
	<b>Total</b>	<b>92.42</b>	<b>7.58</b>	-	-	<b>100.00</b>	-



**FIGURE 4.30: AVAILABILITY OF ROAD NETWORKS WITHIN CSR VILLAGES**



**FIGURE 4.31: OVERALL STATUS OF CONNECTIVITY OF SURVEYED CSR VILLAGES BY METALLED ROADS**



#### 4.3.4 DRINKING WATER FACILITIES

The prime source of drinking water available in most of the surveyed CSR villages are hand pump/tubewell as well as dug wells. Availability of safe drinking water in adequate quantity is one of the basic needs to uplift the quality of life of local people in the villages. Availability of safe drinking water in adequate quantity can be measured in terms of availability of tap water supply for drinking purpose.

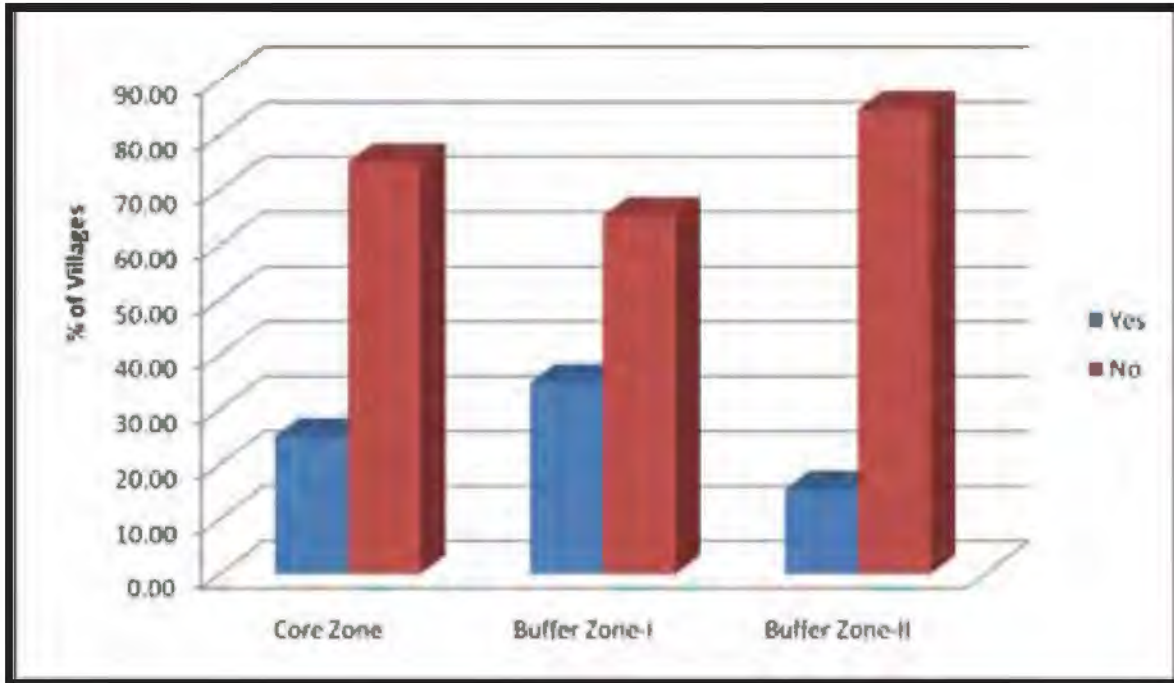
Zone wise detail of availability of tap water supply in surveyed CSR villages is presented in the Table 4.12. The availability of tap water supply in surveyed CSR villages is presented in Figure 4.32. The analysis reveals that out of 4 surveyed CSR villages in core zone, only one village, namely, Chhote Bhandar has tap water supply. Out of the 23 surveyed CSR villages in buffer Zone-I, in case of only 8 CSR villages, there is tap water supply. Out of 33 surveyed CSR villages in Buffer zone-II, only 6 CR villages have availability of tap water supply as source of drinking water.

Overall analysis of tap water supply in surveyed CSR villages shows that out of 66 CSR villages, only 15 villages have tap water supply, whereas remaining villages do not have such facility (Figure 4.33).

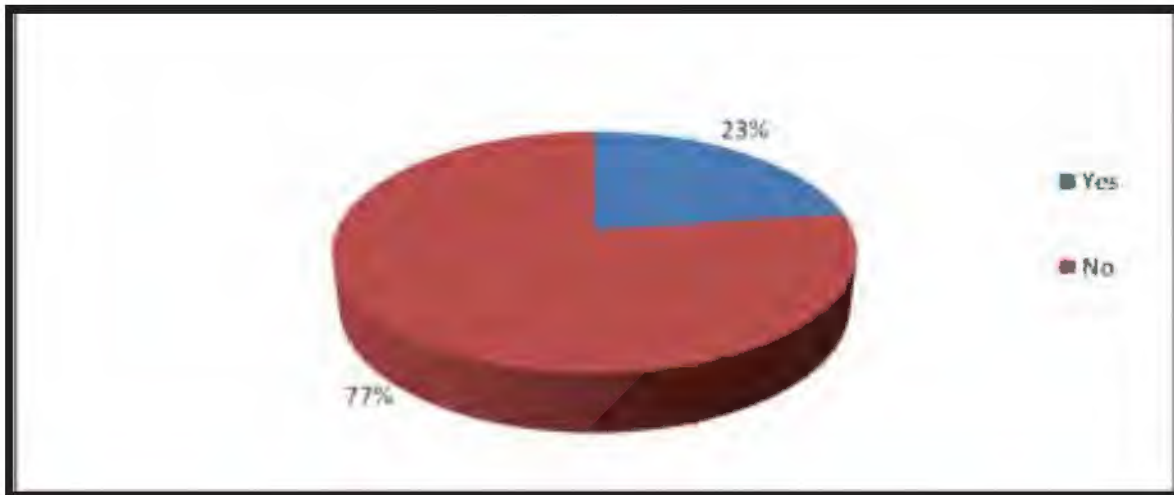
**TABLE 4.12: AVAILABILITY OF SOURCES OF TAP WATER SUPPLY FOR DRINKING IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having Tap Water Supply	
		Yes	No
1	Core Zone	25.00	75.00
2	Buffer Zone-I	34.78	65.22
3	Buffer Zone-II	15.38	84.62
	<b>Total</b>	<b>22.73</b>	<b>77.27</b>

**FIGURE 4.32: AVAILABILITY OF SOURCES OF TAP WATER SUPPLY WITHIN CSR VILLAGES**



**FIGURE 4.33: OVERALL STATUS OF SOURCES OF TAP WATER SUPPLY IN CSR VILLAGES**



### 4.3.5 ELECTRICITY FACILITIES

Electricity is one of the basic needs to uplift the quality of life of local people in the villages. Availability of electricity facilities can be measured in terms of domestic as well as streetlight availability in villages, etc.

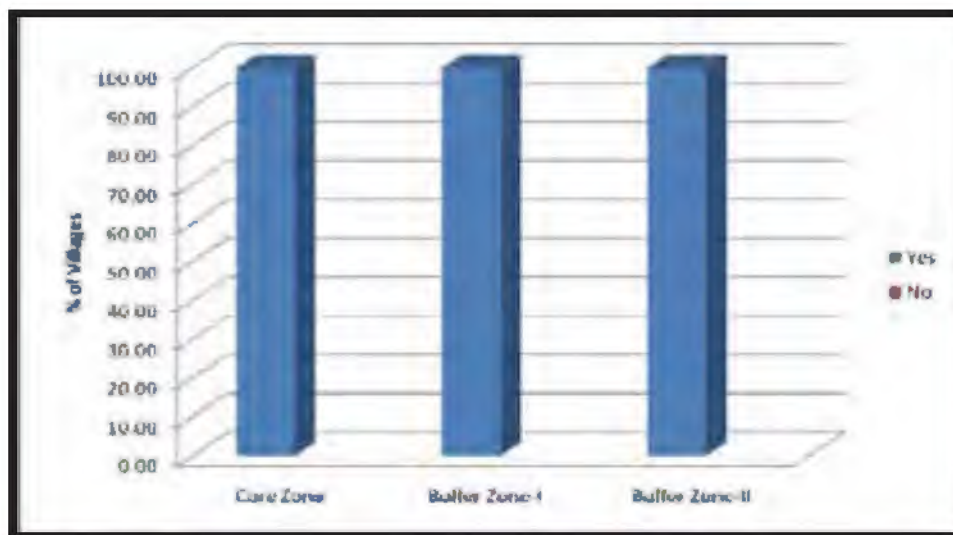
#### Electricity in Household

Zone wise detail of availability of electricity in household of surveyed CSR villages is presented in the Table 4.13. The detail of availability of electricity in household of surveyed CSR villages is presented in Figure 4.34. The analysis reveals that all of the surveyed CSR villages are having electricity facility.

**TABLE 4.13: AVAILABILITY OF ELECTRICITY IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having Electricity	
		Yes	No
1	Core Zone	100.00	-
2	Buffer Zone-I	100.00	-
3	Buffer Zone-II	100.00	-
	<b>Total</b>	<b>100.00</b>	<b>-</b>

**FIGURE 4.34: AVAILABILITY OF ELECTICITY IN HOUSEHOLD OF CSR VILLAGES**



### Street-Light

Zone wise detail of availability of streetlight in surveyed CSR villages is presented in the Table 4.14. The detail of availability of streetlight in surveyed CSR villages is presented in Figure 4.35. The analysis reveals that none of 4 surveyed CSR villages in core zone, 3 villages are having streetlight. Out of the 23 surveyed CSR villages in Buffer Zone-I, only 2 CSR villages, namely Kathli and Chikhli villages under Pusour Block are having streetlight.

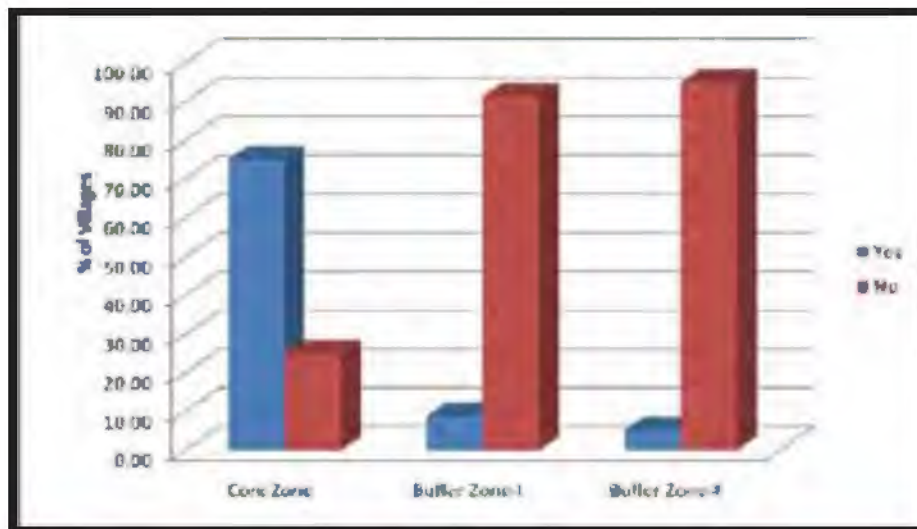
Out of 39 surveyed CSR villages in Buffer zone-II, only 2 CSR villages, namely Thakurpali village under Raigarh Block and Bijna village under Pusour Block are having streetlight.

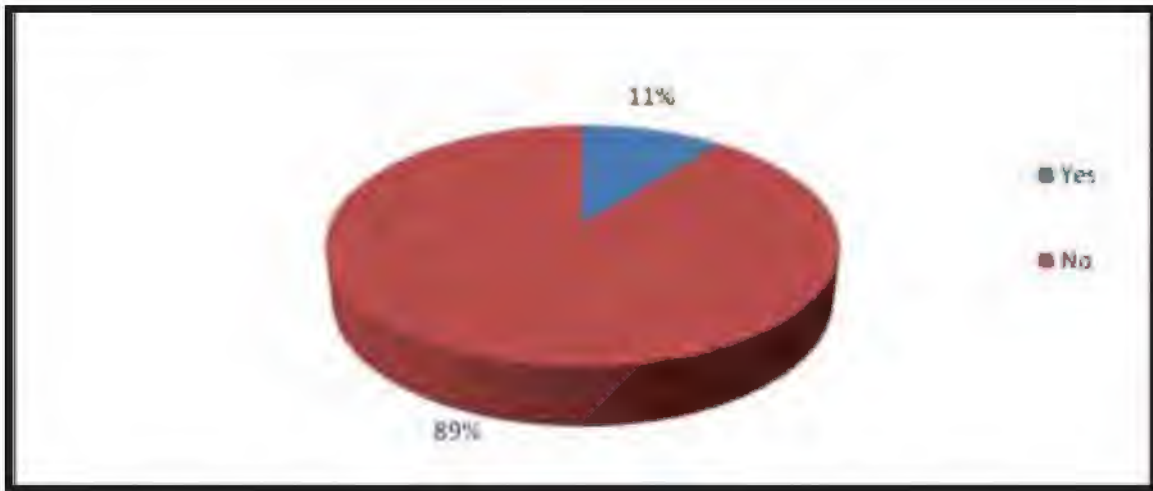
Overall analysis of availability of streetlight in surveyed CSR villages shows that out of 66 CSR villages, only 7 villages are having streetlight (Figure 4.36).

**TABLE 4.14: AVAILABILITY OF STREET LIGHT IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having Street Light	
		Yes	No
1	Core Zone	75.00	25.00
2	Buffer Zone-I	8.70	91.30
3	Buffer Zone-II	5.13	94.87
	<b>Total</b>	<b>10.61</b>	<b>89.39</b>

**FIGURE 4.35: AVAILABILITY OF STREET LIGHT WITHIN CSR VILLAGES**



**FIGURE 4.36: OVERALL AVAILABILITY OF STREET LIGHT IN CSR VILLAGES**

#### 4.3.6 VETERINARY FACILITIES

Veterinary facilities are one of the basic needs to uplift the health status as well as productivity of livestock. Availability of veterinary facilities can be measured in terms of veterinary centre available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest veterinary center, availability of private veterinary doctor and if it is not available within CSR villages, minimum distance to travel to the nearest private veterinary doctor.

##### Veterinary Center

Zone wise detail of availability of veterinary centre in surveyed CSR villages is presented in the Table 4.15. The detail of availability of veterinary centre in surveyed CSR villages is presented in Figure 4.37. The analysis reveals that out of 4 surveyed CSR villages in core zone, only one village, namely Bade Bhandar village is having veterinary centre. Distance of nearest veterinary centre from the remaining villages ranges between 1 to 3.5 km. Sick livestock of Chhote Bhandar village under Pusour Block are to be carried minimum 1 km distance to avail the facility of veterinary centre, which is located at Bade Bhandar, whereas sick livestock of Amlu Bhouna village under Pusour Block are to be carried minimum 3.5 km distance to avail the facility of veterinary centre, which is located at Bade Bhandar.

Out of 23 surveyed CSR villages in buffer Zone-I, only one village, namely Semra village is having veterinary centre. Distance of nearest veterinary centre from the remaining villages ranges between 1 to 7 km. Sick livestock of Bonda village under Pusour Block are to be carried minimum 1 km distance to avail the facility of veterinary centre, which is located at Umriogan, whereas sick



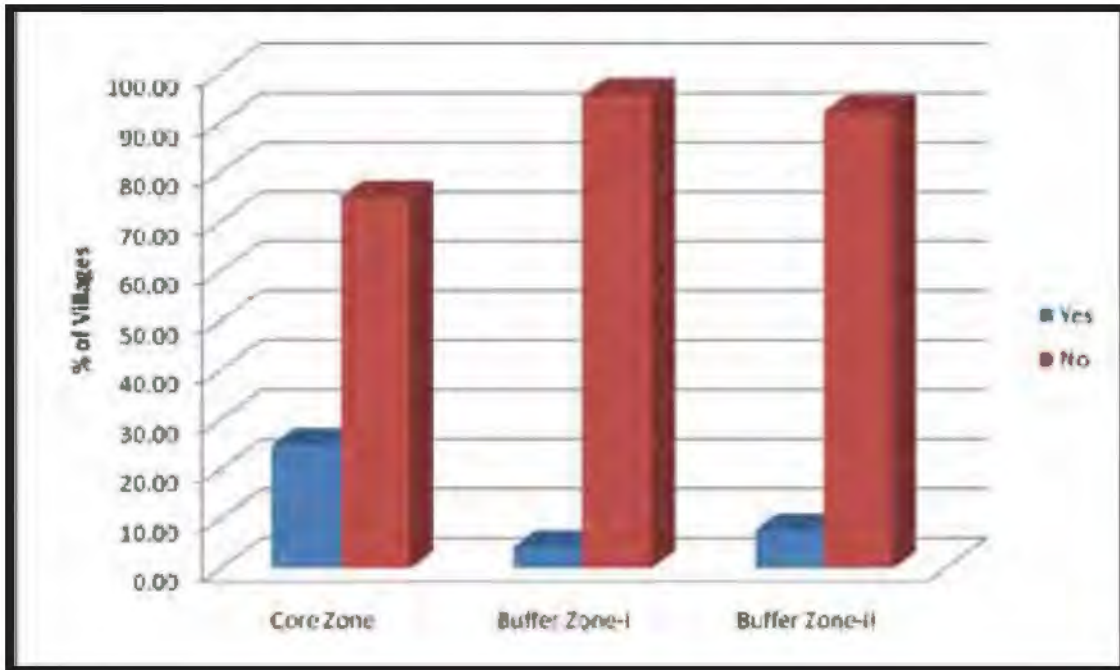
livestocks of Palsada and Bhirha Bhatha villages under Dabhra Block are to be carried minimum 7 km distance to avail the facility of veterinary centre, which is located at Chandrapur. Out of 39 surveyed CSR villages in Buffer zone-II, only 3 villages, namely, Chichor Umariya, Tetla and Gorra villages under Pusour Block are having veterinary centre. Distance of nearest veterinary centre from the remaining villages ranges between 1 to 15 km. Sick livestock of Kurmapali and Tekka villages under Pusour Block are to be carried minimum 1 km distance to avail the facility of veterinary centre, which is located at Gorra, whereas sick livestock of Siladi and Basanpali villages under Pusour Block are to be carried minimum 15 km distance to avail the facility of veterinary centre, which is located at Pusour.

Overall analysis of availability of veterinary centre shows that out of 66 surveyed CSR villages, only 5 villages have veterinary centre (Figure 4.38). Out of the remaining villages, in case of 66.67% of the villages, sick livestock are to be carried less than 5 km distance to avail such facility, whereas in case of 10.53% of the villages sick livestock are to be carried 10-20 km distance to avail such facility.

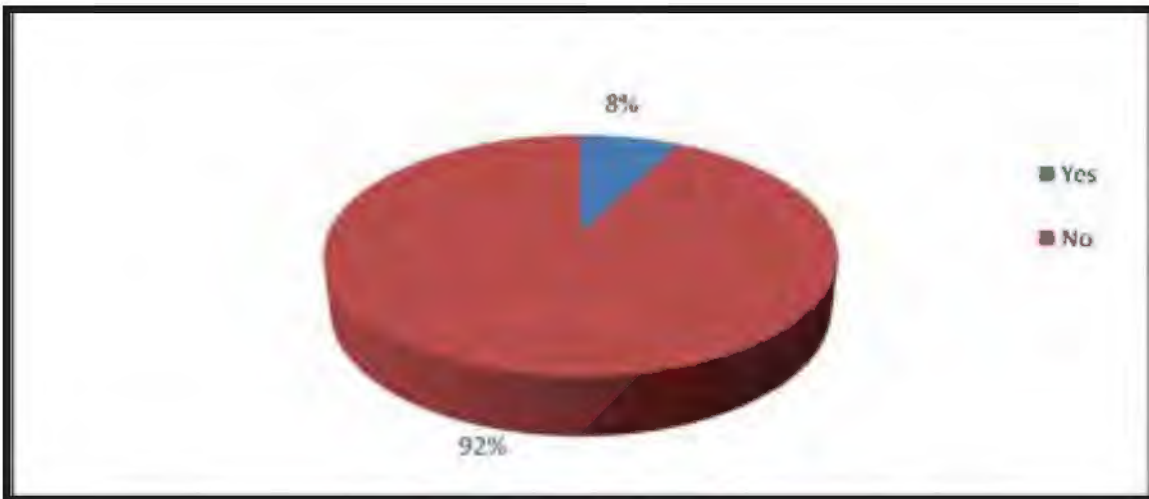
**TABLE 4.15: DISTRIBUTION OF VETERINARY CENTRES IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of surveyed CSR Villages Having Veterinary Centre		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	25.00	75.00	100.00	-	-	-
2	Buffer Zone-I	4.35	95.65	75.00	25.00	-	-
3	Buffer Zone-II	7.69	92.31	58.82	23.53	17.65	-
	<b>Total</b>	<b>7.58</b>	<b>92.42</b>	<b>66.67</b>	<b>22.81</b>	<b>10.53</b>	<b>-</b>

**FIGURE 4.37: AVAILABILITY OF VETERINARY CENTRE WITHIN CSR VILLAGES**



**FIGURE 4.38: OVERALL AVAILABILITY OF STREET LIGHT IN CSR VILLAGES**





### Private Veterinary Doctor

Zone wise detail of availability of private veterinary doctor in surveyed CSR villages is presented in the Table 4.16. The detail of availability of private veterinary doctor in surveyed CSR villages is presented in Figure 4.39. The analysis reveals that none of 4 surveyed CSR villages in core zone is having private veterinary doctor. Sick livestock of Sarvani village under Pusour Block are to be carried minimum 2 km distance to avail the facility of private veterinary doctor, which is located at Jatri/Bade Bhandar, whereas sick livestock of Amla Bhouna village under Pusour Block are to be carried minimum 5 km distance to avail the facility of private veterinary doctor, which is located at Chandralau.

Out of 23 surveyed CSR villages in Buffer Zone-I, only one village, namely, Semra is having private veterinary doctor. Distance of nearest private veterinary doctor from the villages not having private veterinary doctor ranges between 2 to 7 km. Sick livestock of Barpali village under Pusour Block are to be carried minimum 2 km distance to avail the facility of private veterinary doctor, which is located at Bade Bhandar, whereas sick livestock of Palsada and Bhirha Bhatta villages under Dabhra Block are to be carried minimum 7 km distance to avail the facility of private veterinary doctor, which is located at Chandrapur. Out of 39 surveyed CSR villages in Buffer zone-II, only 3 villages are having private veterinary doctor. Sick livestock of Tekka village under Pusour Block are to be carried minimum 1 km distance to avail the facility of private veterinary doctor, which is located at Gorra, whereas sick livestock of Thakurpali village under Raigarh Block are to be carried minimum 15 km distance to avail the facility of private veterinary doctor, which is located at Raigarh.

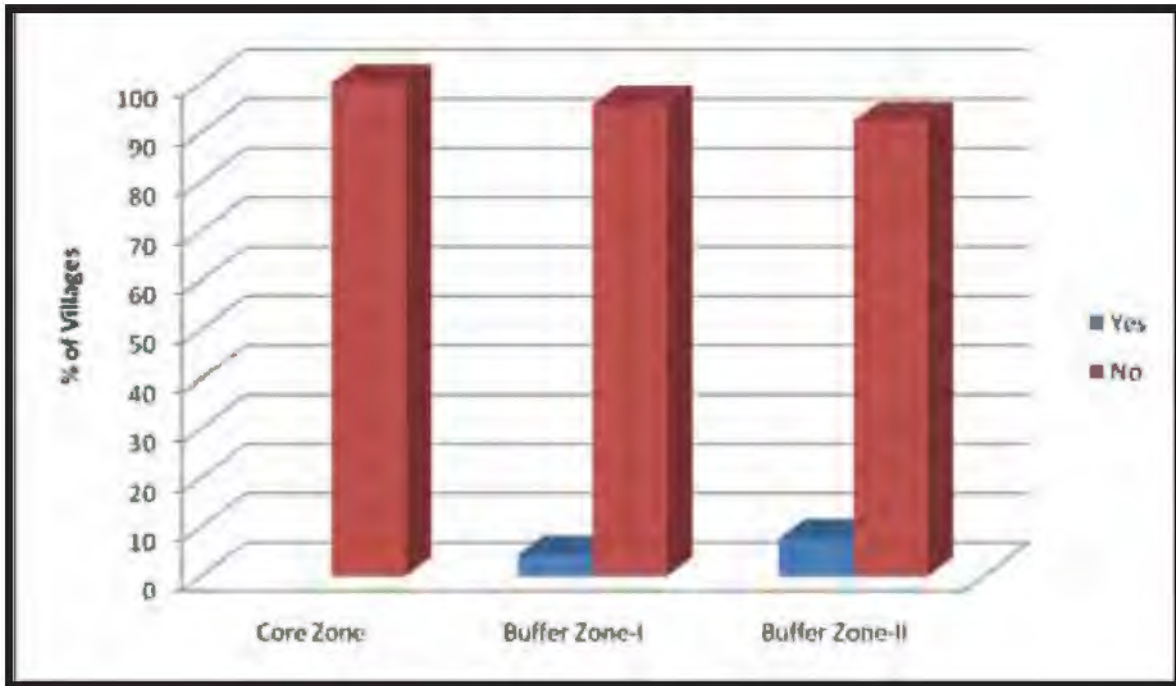
Overall analysis of availability of private veterinary doctor shows that out of 66 surveyed CSR villages, only 4 villages have private veterinary doctor (Figure 4.40). In case of 12.73% of the villages, private veterinary doctors are available at distance of 10-20 km, whereas in case of 58.18% of the villages they are available at distance of less than 5 km.

**TABLE 4.16: DISTRIBUTION OF PRIVATE VETERINARY DOCTORS IN SURVEYED CSR VILLAGES**

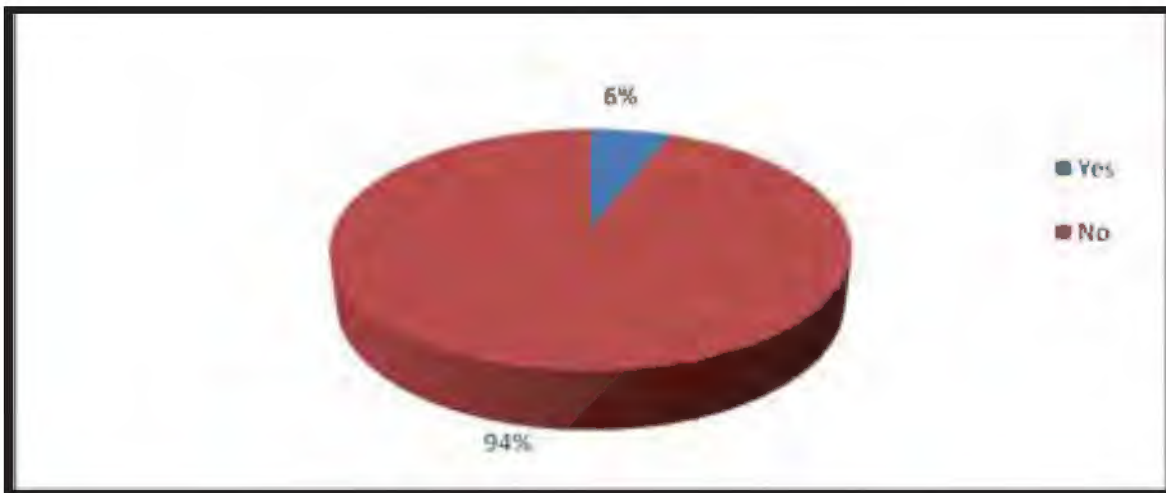
Sl. No.	Zone	No. of surveyed CSR Villages Having Private Veterinary Doctor		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	-	100.00	100.00	-	-	-
2	Buffer Zone-I	4.35	95.65	68.42	31.58	-	-
3	Buffer Zone-II	7.69	92.31	50.00	29.41	20.59	-
	<b>Total</b>	<b>6.06</b>	<b>93.94</b>	<b>58.18</b>	<b>29.09</b>	<b>12.73</b>	<b>-</b>



**FIGURE 4.39: AVAILABILITY OF VETERINARY CENTRE WITHIN CSR VILLAGES**



**FIGURE 4.40: OVERALL AVAILABILITY OF STREET LIGHT IN CSR VILLAGES**



### 4.3.7 RAILWAY STATION

Connectivity of villages by railway station is one of the basic needs to uplift the quality of life of local people in the villages. Railway network facility can be measured in terms of village connected by railway station and if it is not connected, minimum distance to travel to the nearest railway station.

Zone wise detail of connectivity of surveyed CSR villages by railway station is presented in the Table 4.17. The analysis reveals that none of 4 surveyed CSR villages in core zone is connected by railway station. Distance of nearest railway station from these villages ranges between 22 to 25 km. People of Bade Bhandar, Sarvani and Chhote Bhandar villages under Pusour Block are to travel minimum 22 km to avail such facility, located at Raigarh, whereas people of Amlhi Bhouna village under Pusour Block are to travel minimum 25 km to avail such facility, located at Raigarh.

None of 23 surveyed CSR in buffer zone-I is connected by railway station. Distance of nearest railway station from these villages ranges between 15 to 100 km. People of Raibar village under Pusour Block are to travel minimum 15 km to avail such facility located at Raigarh, whereas people of Chandli village under Dabhra Block are to travel minimum 100 km to avail such facility located at Jahangir Chapa. None of 39 surveyed CSR villages in buffer zone-II is connected by railway station. Distance of nearest railway station from these villages ranges between 5 to 120 km. People of Chuhipali village under Raigarh Block are to travel minimum 5 km located at Raigarh to avail such facility, whereas people of Kurmapali village under Pusour Block are to travel minimum 120 km to avail such facility located at Raigarh.

Overall analysis of connectivity of surveyed CSR villages by railway station shows that out of 66 surveyed CSR villages, only one village is connected by railway station. In case of 3.13% of remaining villages, people are to travel less than 10 km distance to avail such facility, whereas in case of 54.69% of the villages people are to travel more than 20 km distance to avail such facility.

**TABLE 4.17: CONNECTIVITY OF SURVEYED CSR VILLAGES BY RAILWAY STATION**

Sl. No.	Zone	No. of surveyed CSR Villages Connected by Railway Station		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	-	100.00	-	-	-	100.00
2	Buffer Zone-I	-	100.00	-	-	27.27	72.73
3	Buffer Zone-II	-	100.00	-	5.26	55.26	39.47
	<b>Total</b>	-	<b>100.00</b>	-	<b>3.13</b>	<b>42.19</b>	<b>54.69</b>



### 4.3.8 BUS SERVICE

Connectivity of villages by bus service is one of the basic needs to uplift the quality of life of local people in the villages. Bus service facility can be measured in terms of village connected by bus service and if it is not connected, minimum distance to travel to the nearest bus service.

Zone wise detail of connectivity of surveyed CSR villages by bus service is presented in the Table 4.18. The detail of connectivity of surveyed CSR villages by bus service is presented in Figure 4.41. The analysis reveals that out of 4 surveyed CSR villages in core zone, 3 villages are connected by bus service. Distance of nearest bus service from the village not connected by bus service is 5 km. People of Sarvani village under Pusour Block are to travel minimum 5 km located at Supa.

Out of the 23 surveyed CSR villages in Buffer Zone-I, 10 villages are connected by bus service, though 13 villages are not connected by bus service. Distance of nearest bus service from the villages, which are not connected by bus service, ranges between 2 to 10 km. People of Barpali, Bunga and Ranbhatha villages under Pusour Block are to travel minimum 2 km to avail such facility located at Bade Bhandar, whereas people of Bonda village under Pusour Block are to travel minimum 10 km to avail such facility located at Pusour. Out of 39 surveyed CSR villages in Buffer zone-II, only 7 villages are connected by bus service. Distance of nearest bus service from the villages not connected by bus service ranges between 1 to 30 km. People of Jampali village under Pusour Block are to travel minimum 1 km to avail such facility located at Kurmapali, whereas people of Khaprapali village under Pusour Block are to travel minimum 30 km to avail such facility.

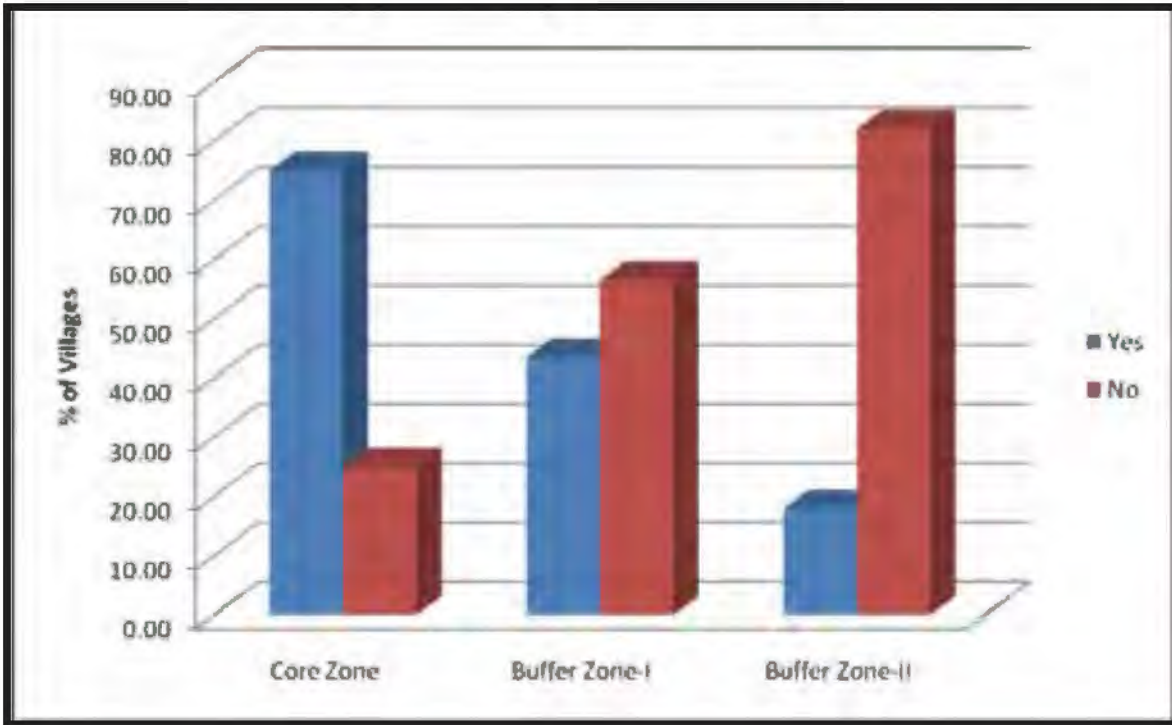
Overall analysis of connectivity of surveyed CSR villages by bus service shows that out of 66 surveyed CSR villages, only 20 villages are already connected by bus service, whereas remaining 46 (69.70%) villages are not connected by bus service (Figure 4.42). Out of these 46 villages, in case of 21 villages, people are to travel less than 5 km distance to avail such facility, whereas in case of 21 villages people are to travel 5-10 km distance and people of 2 villages are to travel 10-20 km distance to avail such facility.

**TABLE 4.18: CONNECTIVITY OF SURVEYED CSR VILLAGES BY BUS SERVICE**

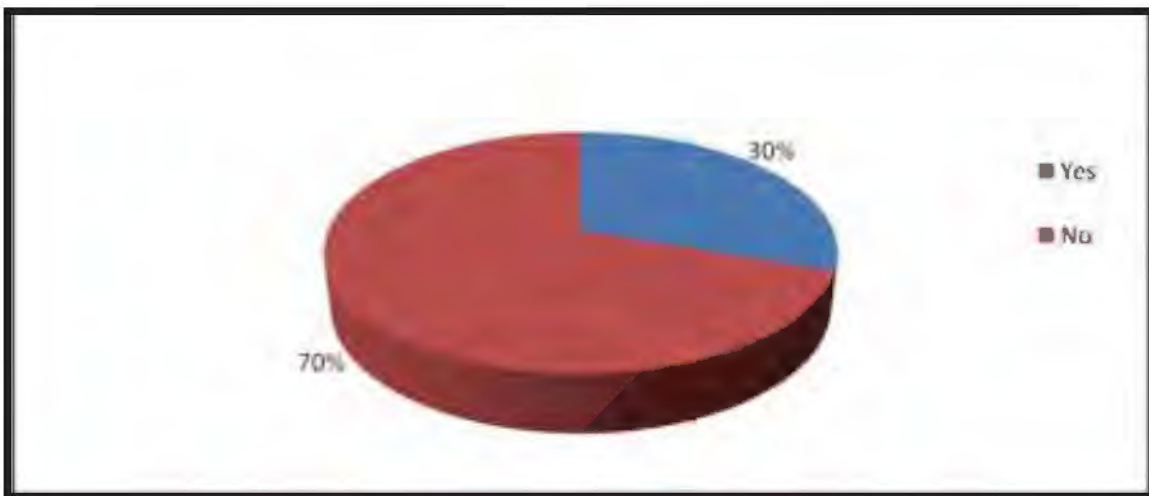
Sl. No.	Zone	No. of Surveyed CSR Villages Connected by Bus Service		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	75.00	25.00	-	100.00	-	-
2	Buffer Zone-I	43.48	56.52	58.33	41.67	-	-
3	Buffer Zone-II	17.95	82.05	45.16	48.39	6.45	-
	<b>Total</b>	<b>30.30</b>	<b>69.70</b>	<b>47.73</b>	<b>47.73</b>	<b>4.55</b>	<b>-</b>



**FIGURE 4.41: AVAILABILITY OF BUS SERVICE WITHIN CSR VILLAGES**



**FIGURE 4.42: OVERALL STATUS OF CONNECTIVITY OF CSR VILLAGES BY BUS SERVICE**



### 4.3.9 VOCATIONAL TRAINING

Skill development is one of the basic needs to increase the employability of unemployed youth. Availability of vocational training facilities can be measured in terms of vocational training centre available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest vocational training center.

Zone wise detail of availability of various vocational training facilities viz., vocational training center, etc. in surveyed CSR villages is presented in the Table 4.19. The analysis reveals that none of 4 surveyed CSR villages in core zone are having vocational training centre. Distance of nearest vocational training centre from these villages ranges between 13 to 30 km. People of Bade Bhandar village under Pusour Block are to travel minimum 13 km distance to avail the facility of vocational training centre, which is located at Pusour, whereas people of Sarvani village under Pusour Block are to travel minimum 30 km distance to avail the facility of vocational training centre, which is located at Raigarh.

None of 23 surveyed CSR villages in Buffer zone-I is having vocational training centre. Distance of nearest vocational training centre from these villages ranges between 3 to 30 km. People of Chandli village under Dabhra Block are to travel minimum 3 km distance to avail the facility of vocational training centre, which is located at Iqbalpur, whereas people of Amlipali village under Pusour Block are to travel minimum 30 km distance to avail the facility of vocational training centre, which is located at Palhr/Raigarh. None of 39 surveyed CSR villages in Buffer zone-II is having vocational training centre. Distance of nearest vocational training centre from remaining villages ranges between 2 to 40 km. People of Jiladi and Raitarai villages under Pusour Block are to travel minimum 2 km distance to avail the facility of vocational training centre, which is located at Pusour, whereas people of Mahadevpali village under Dabhra Block are to travel minimum 40 km distance to avail the facility of vocational training centre, which is located at Raigarh.

Overall analysis of availability of vocational training centre in CSR villages shows that none of 66 surveyed CSR villages is having vocational training center.

**TABLE 4.19: DISTRIBUTION OF VOCATIONAL TRAINING CENTRE  
IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of CSR Villages having Vocational Training Centre		If No, Distance (km)			
		Yes	No	< 20	20-50	50-80	>80
1	Core Zone	-	100.00	50.00	50.00	-	-
2	Buffer Zone-I	-	100.00	68.18	31.82	-	-

Sl. No.	Zone	No. of CSR Villages having Vocational Training Centre		If No, Distance (km)			
		Yes	No	< 20	20-50	50-80	>80
3	Buffer Zone-II	-	100.00	81.08	18.92	-	-
	<b>Total</b>	-	<b>100.00</b>	<b>74.60</b>	<b>25.40</b>	-	-

#### 4.3.10 PUBLIC DISTRIBUTION SYSTEM

Public distribution system is one of the basic needs to provide food grain and other material to poor people. Availability of public distribution system can be measured in terms of ration shop available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest ration shop.

Zone wise detail of availability of ration shop in surveyed CSR villages is presented in the Table 4.20. The detail of availability of ration shop in surveyed CSR villages is presented in Figure 4.43. The analysis reveals that out of 4 surveyed CSR villages in core zone, 3 CSR villages have ration shop. Distance of nearest ration shop from the remaining village is 1 km. People of Amlhi Bhouna village under Pusour Block are to travel minimum 1 km distance to avail the facility of ration shop, which is located at Chote Bhandar.

Out of 23 surveyed CSR villages in buffer Zone-I, 13 CSR villages have ration shop. Distance of nearest ration shop from the remaining villages ranges between 500 m to 7 km. People of Kathli village under Pusour Block are to travel minimum 500 m distance to avail the facility of ration shop, which is located at Taparda, whereas people of Bhirha Bhatha village under Dabhra Block are to travel minimum 7 km distance to avail the facility of ration shop, which is located at Chandrapur. Out of 39 surveyed CSR villages in buffer zone-II, 27 CSR villages have ration shop. Distance of nearest ration shop from the remaining villages ranges between 1 to 15 km. People of Tekka village under Pusour Block are to travel minimum 1 km distance to avail the facility of ration shop, which is located at Pacheda, whereas people of Siladi village under Pusour Block are to travel minimum 15 km distance to avail the facility of ration shop, which is located at Bonda.

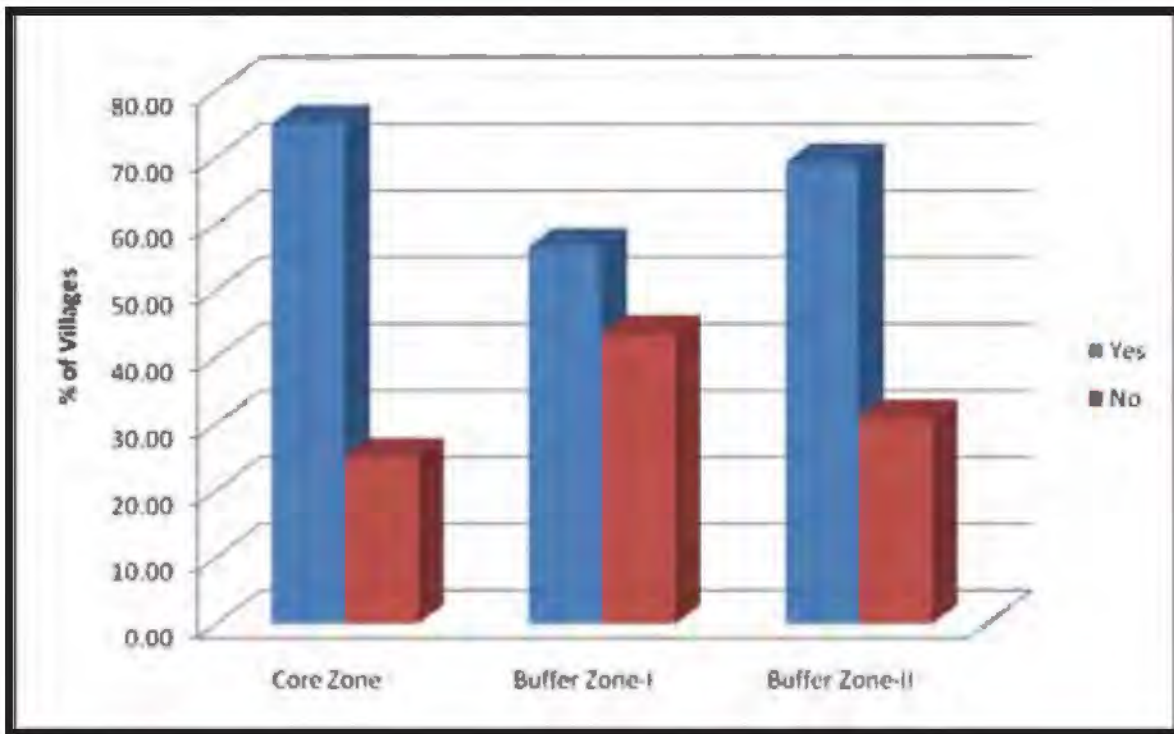
Overall analysis of availability of ration shop in surveyed CSR villages shows that out of 66 CSR villages, 43 villages have ration shop (Figure 4.44). Out of the remaining villages, in case of 81.82% of the villages, people are to travel less than 5 km distance to avail such facility, whereas in case of 13.64% of the villages, people are to travel 5-10 km distance to avail such facility.



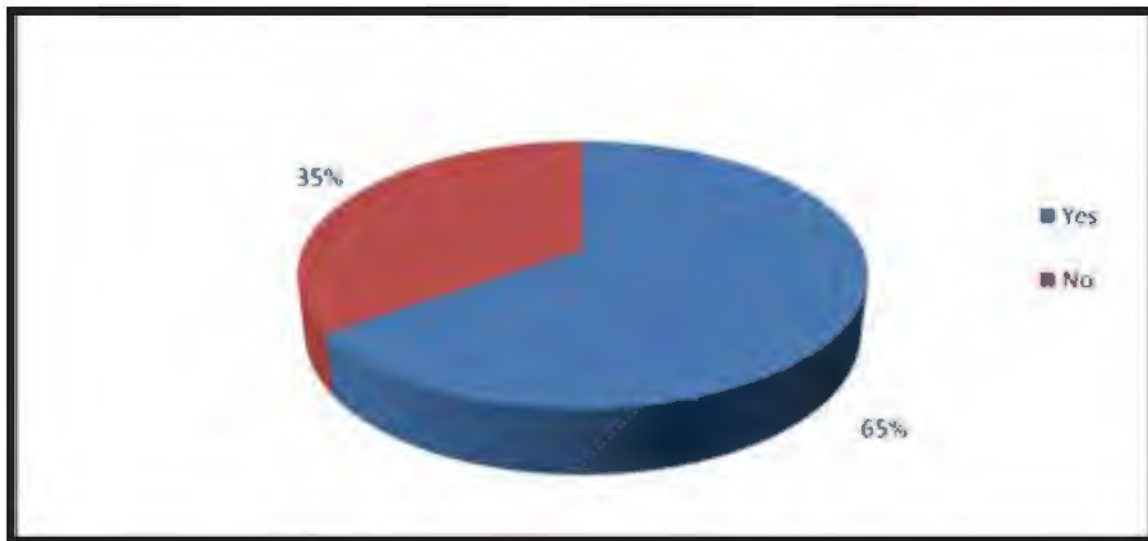
**TABLE 4.20: DISTRIBUTION OF RATION SHOP IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of CSR Villages Having Ration Shop		If No, Distance (km)		
		Yes	No	< 5	5-10	>10
1	Core Zone	75.00	25.00	100.00	-	-
2	Buffer Zone-I	56.52	43.48	80.00	20.00	-
3	Buffer Zone-II	69.23	30.77	81.82	9.09	9.09
	<b>Total</b>	<b>65.15</b>	<b>34.85</b>	<b>81.82</b>	<b>13.64</b>	<b>4.55</b>

**FIGURE 4.43: AVAILABILITY OF RATION SHOP WITHIN CSR VILLAGES**





**FIGURE 4.44: OVERALL AVAILABILITY OF RATION SHOP IN CSR VILLAGES**

#### 4.3.11 COMMUNICATION & BANKING FACILITY

Communication & banking facilities are one of the prime needs of local people. Availability of communication & banking facilities can be measured in terms of post office & commercial bank available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest post office & commercial bank.

##### Post Office

Zone wise detail of availability of post office in surveyed CSR villages is presented in the Table 4.21. The detail of availability of post office in surveyed CSR villages is presented in Figure 4.45. The analysis reveals that out of 4 surveyed CSR villages in core zone, only one village, namely Bade Bhandar village under Pusour Block have post office, though remaining 3 villages do not have any post office. Distance of nearest post office from these villages ranges between 1 to 2 km. People of Chhote Bhandar village under Pusour Block are to travel minimum 1 km distance to avail the facility of post office, which is located at Bade Bhandar, whereas people of Sarvani village under Pusour Block are to travel minimum 2 km distance to avail the facility of post office, which is located at Jatri.

Out of 23 surveyed CSR villages in Buffer Zone-I, 3 villages have post office. Distance of nearest post office from the remaining villages ranges between 500 m to 7 km. People of Kathli village under Pusour Block are to travel minimum 500 m distance to avail the facility of post office, which is located at Taparda, whereas people of Palsada village under Dabhra Block are to travel



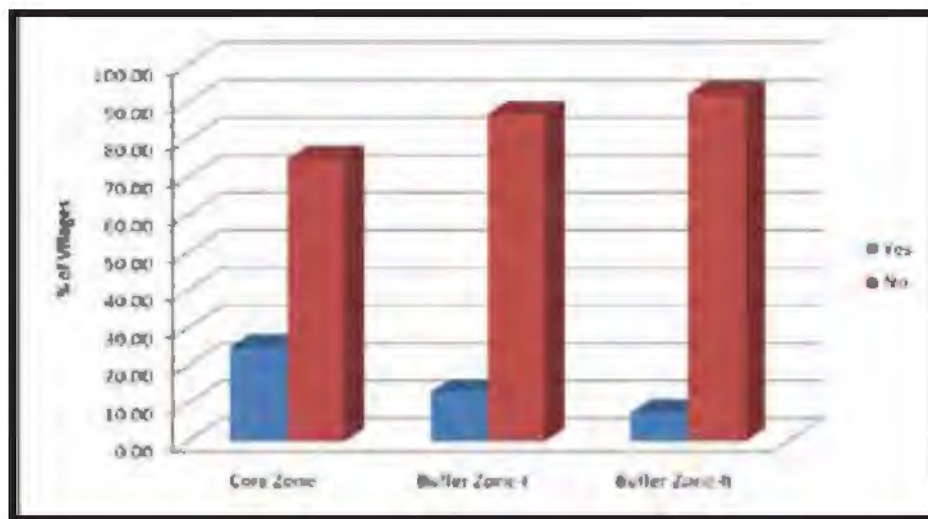
minimum 7 km distance to avail the facility of post office, which is located at Chandrapur. Out of 39 surveyed CSR villages in Buffer Zone-II, 3 villages have post office. Distance of nearest post office from the remaining villages ranges between 2 to 12 km. People of Bulaki and Raitarai villages under Pusour Block are to travel minimum 2 km distance to avail the facility of post office, which is located at Gorra, whereas people of Singpuri village under Pusour Block are to travel minimum 12 km distance to avail the facility of post office, which is located at Pusour.

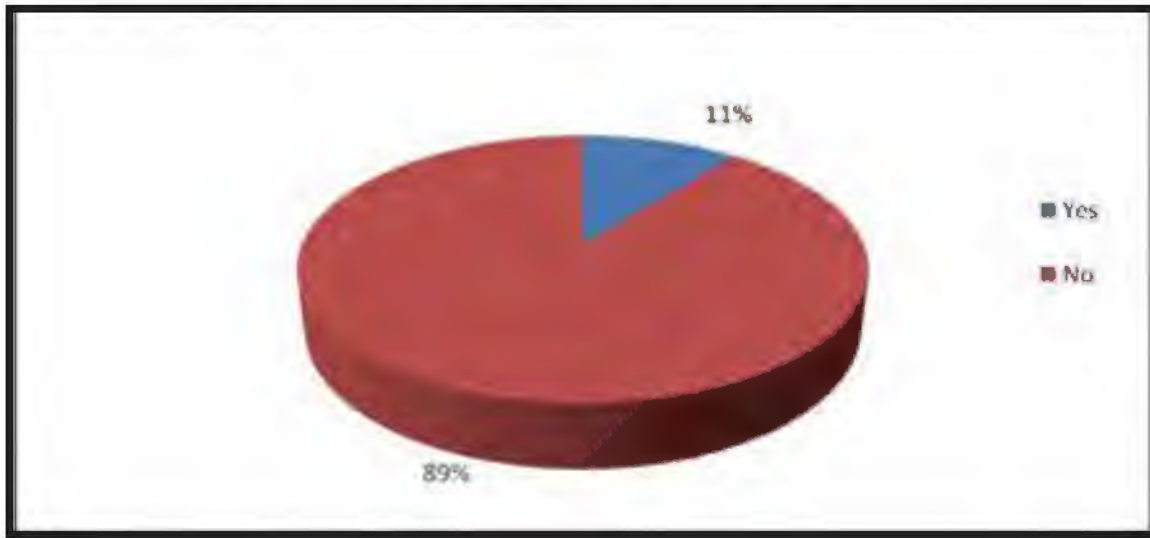
Overall analysis of availability of post office in surveyed CSR villages shows that out of 66 CSR villages, 7 villages have post office (Figure 4.46). Out of remaining villages, in case of 1.79% of the villages, people are to travel less than 1 km distance to avail such facility, whereas in case of 5.36% of the villages people are to travel 1-2 km distance and in case of 82.14% of the villages people are to travel 2-5 km distance to avail such facility.

**TABLE 4.21: DISTRIBUTION OF POST OFFICE IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of CSR Villages Having Post Office		If No, Distance (km)			
		Yes	No	< 1	1-2	2-5	>5
1	Core Zone	25.00	75.00	-	66.67	33.33	-
2	Buffer Zone-I	13.04	86.96	5.56	5.56	77.78	11.11
3	Buffer Zone-II	7.69	92.31	-	-	88.57	11.43
	<b>Total</b>	<b>10.61</b>	<b>89.39</b>	<b>1.79</b>	<b>5.36</b>	<b>82.14</b>	<b>10.71</b>

**FIGURE 4.45: AVAILABILITY OF POST OFFICE WITHIN CSR VILLAGES**



**FIGURE 4.46: OVERALL AVAILABILITY OF POST OFFICE IN CSR VILLAGES**

### Commercial Bank

Zone wise detail of availability of commercial bank in surveyed CSR villages is presented in the Table 4.22. The detail of availability of commercial bank in surveyed CSR villages is presented in Figure 4.47. The analysis reveals that out of 4 surveyed CSR villages in core zone, only one village, namely Bade Bhandar village under Pusour Block has commercial bank, though remaining 3 villages do not have any commercial bank. Distance of nearest commercial bank from these villages ranges between 1 to 3.5 km. People of Chhote Bhandar village under Pusour Block are to travel minimum 1 km distance to avail the facility of commercial bank, which is located at Bade Bhandar, whereas people of Amla Bhouna village under Pusour Block are to travel minimum 3.5 km distance to avail the facility of commercial bank, which is located at Bade Bhandar.

None of 23 surveyed CSR villages in Buffer Zone-I have commercial bank. Distance of nearest commercial bank from these villages ranges between 2 to 10 km. People of Chote Bhandar and Barpali villages under Pusour Block are to travel minimum 2 km distance to avail the facility of commercial bank, which is located at Bade Bhandar, whereas people of Bonda village under Pusour Block are to travel minimum 10 km distance to avail the facility of commercial bank, which is located at Pusour. Out of 39 surveyed CSR villages in Buffer Zone-II, only one village, namely, Putkapuri village has commercial bank. People of Kwrika and Pacheda villages under Pusour Block are to travel minimum 2 km distance to avail the facility of commercial bank, which is located at Putkapuri.

Overall analysis of availability of commercial bank in surveyed CSR villages shows that out of 66 villages, only 2 villages have commercial bank (Figure 4.48). Out of the remaining villages, in case

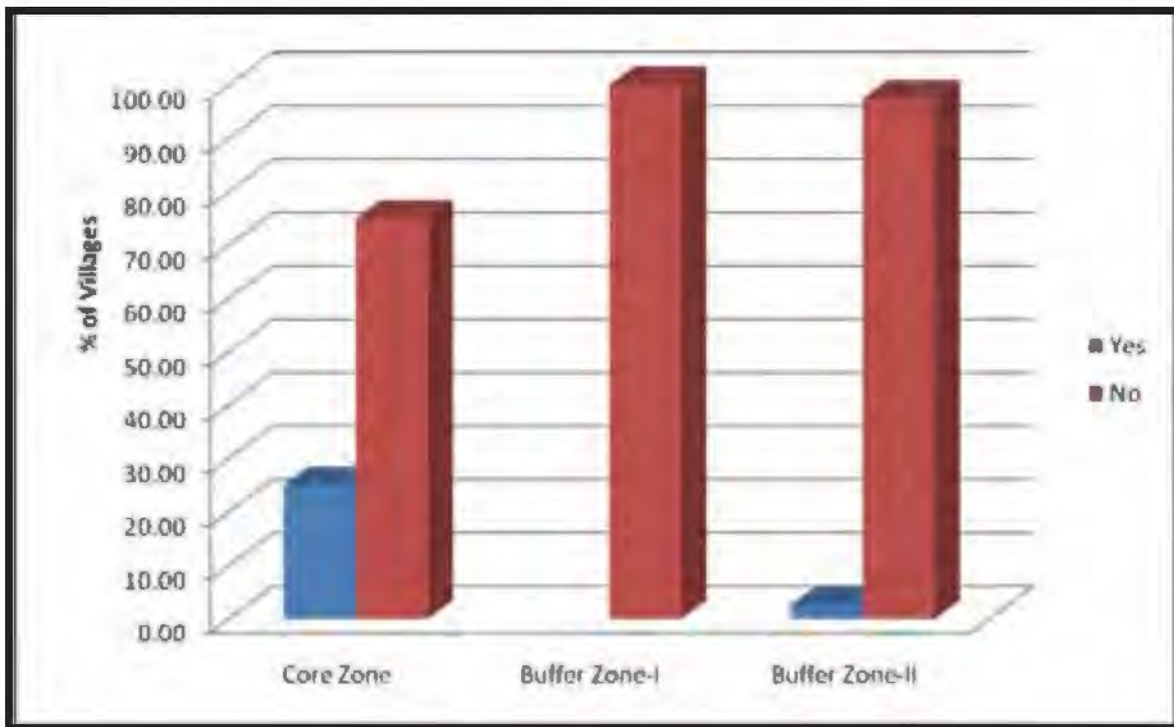


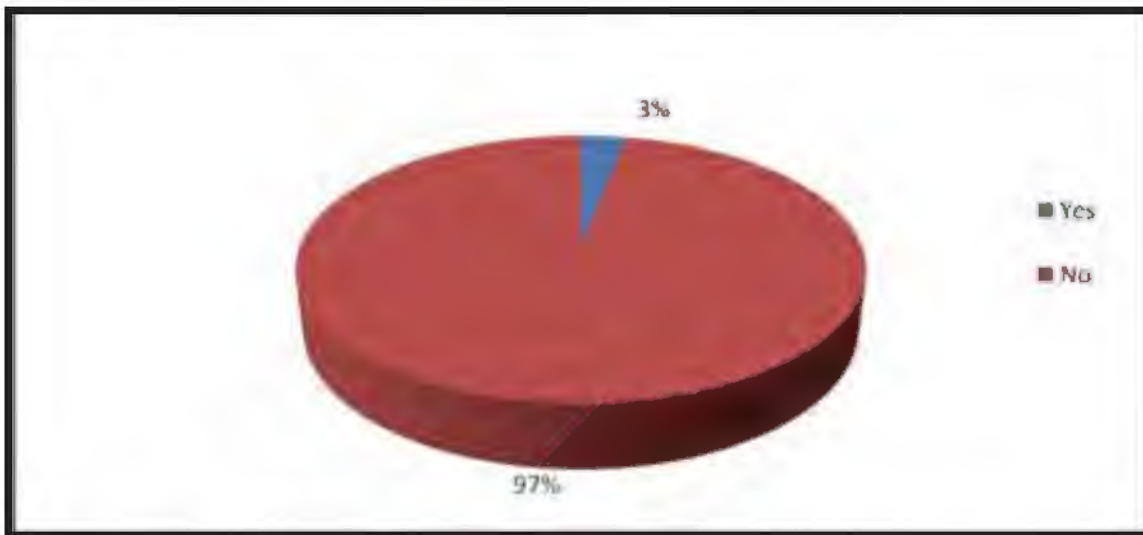
of 56.90% of the villages, people are to travel less than 5 km distance to avail such facility, whereas in case of 36.21% villages people are to travel 5-10 km distance to avail such facility.

**TABLE 4.22: DISTRIBUTION OF COMMERCIAL BANK IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of Surveyed CSR Villages Having Commercial Bank		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	25.00	75.00	100.00	-	-	-
2	Buffer Zone-I	-	100.00	68.18	27.27	4.55	-
3	Buffer Zone-II	2.56	97.44	45.45	45.45	9.09	-
	<b>Total</b>	<b>3.03</b>	<b>96.97</b>	<b>56.90</b>	<b>36.21</b>	<b>6.90</b>	<b>-</b>

**FIGURE 4.47: AVAILABILITY OF COMMERCIAL BANK WITHIN CSR VILLAGES**



**FIGURE 4.48: OVERALL AVAILABILITY OF COMMERCIAL BANK IN CSR VILLAGES**

#### 4.3.12 AGRICULTURAL DEVELOPMENT FACILITIES

Agricultural development activities require better quality of seeds as well as fertilizer including effective pesticide and insecticide, etc. The modernization as well as automation of agricultural activities require easy financing available to the farmers locally. Availability of agricultural development facilities can be measured in terms of agricultural cooperative society available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest agricultural cooperative society; seeds & fertilizer distribution centre/kishan help centre available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest seeds & fertilizer distribution centre/kishan help center.

##### **Agricultural Cooperative Society**

Zone wise detail of availability of agricultural cooperative society in surveyed CSR villages is presented in the Table 4.23. The detail of availability of agricultural cooperative society in surveyed CSR villages is presented in Figure 4.49. The analysis reveals that out of 4 surveyed CSR villages in core zone, only one village, namely Bade Bhandar village under Pusour Block has agricultural cooperative society. Distance of nearest agricultural cooperative society from the remaining villages ranges between 1 to 3.5 km. People of Chhote Bhandar village under Pusour Block are to travel minimum 1 km distance to avail the facility of agricultural cooperative society, which is located at Bade Bhandar, whereas people of Amlhi Bhouna village under Pusour Block are to travel minimum 3.5 km distance to avail the facility of agricultural cooperative society, which is located at Bade Bhandar.



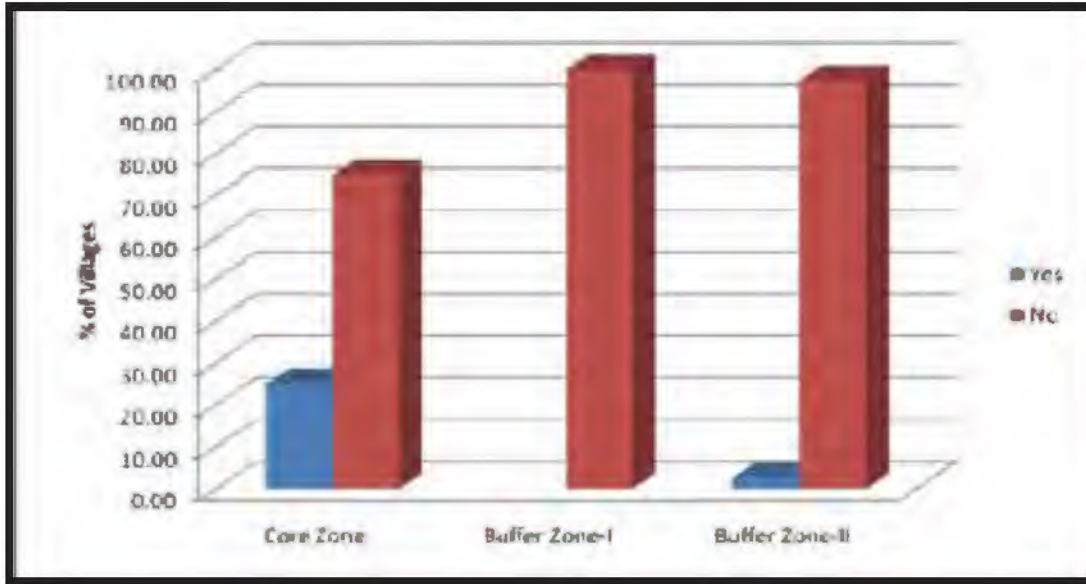
None of 23 CSR villages in Buffer Zone-I have agricultural cooperative society. People of Jeveridih and Barpali villages under Pusour Block are to travel minimum 2 km distance to avail the facility of agricultural cooperative society, which is located at badebhandar. Out of 39 surveyed CSR villages in Buffer zone-II, only one village, namely Putkapuri village under Pusour Block has agricultural cooperative society. Distance of nearest agricultural cooperative society from the remaining villages ranges between 2 to 15 km. People of Bulaki, Tekka and Raitarai villages under Pusour Block are to travel minimum 2 km distance to avail the facility of agricultural cooperative society, which is located at Putkapuri, whereas people of Semibhwar and Siladi villages under Pusour Block are to travel minimum 15 km distance to avail the facility of agricultural cooperative society, which is located at Pusour.

Overall analysis of availability of agricultural cooperative society in surveyed CSR villages shows that out of 66 CSR villages, only 2 villages have agricultural cooperative society (Figure 4.50). Out of the remaining villages, in case of 55.93% of the villages, people are to travel less than 5 km distance to avail such facility, whereas in case of 30.51% of the villages people are to travel 5-10 km distance to avail such facility.

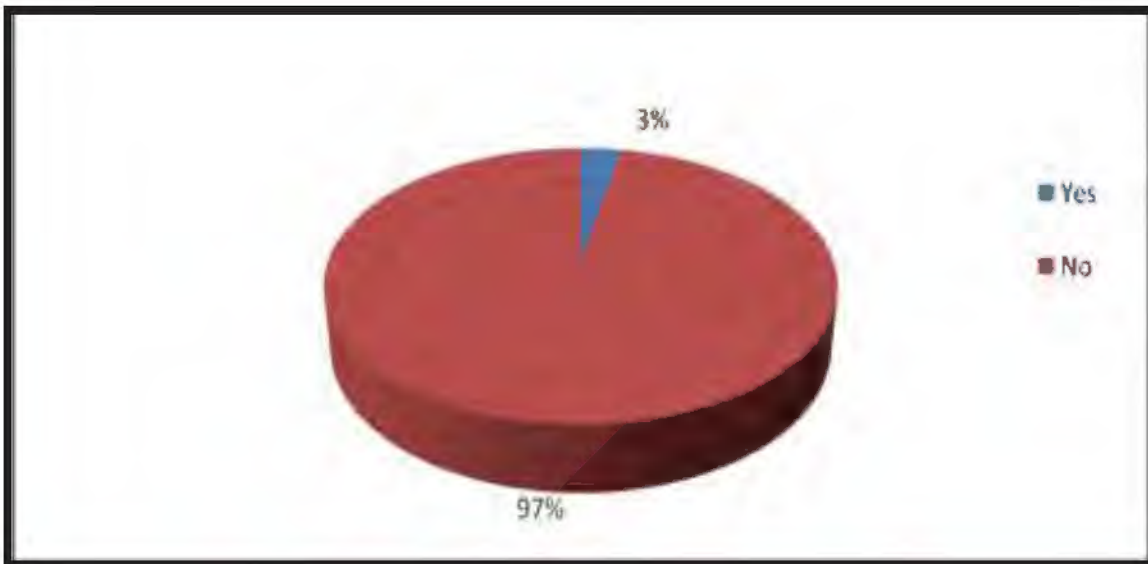
**TABLE 4.23: DISTRIBUTION OF AGRICULTURAL COOPERATIVE SOCIETY  
IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of CSR Villages Having Agricultural Cooperative Society		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	25.00	75.00	100.00	-	-	-
2	Buffer Zone-I	-	100.00	59.09	40.91	-	-
3	Buffer Zone-II	2.56	97.44	50.00	26.47	23.53	-
	<b>Total</b>	<b>3.03</b>	<b>96.97</b>	<b>55.93</b>	<b>30.51</b>	<b>13.56</b>	<b>-</b>

**FIGURE 4.49: AVAILABILITY OF AGRICULTURAL COOPERATIVE SOCIETY WITHIN CSR VILLAGES**



**FIGURE 4.50: OVERALL AVAILABILITY OF AGRICULTURAL COOPERATIVE SOCIETY IN CSR VILLAGES**



### Seeds & Fertilizer Distribution Centre/Kishan Help Centre

Zone wise detail of availability of seeds & fertilizer distribution centre/kishan help centre in surveyed CSR villages is presented in the Table 4.24. The detail of availability of seeds & fertilizer distribution centre/kishan help centre in surveyed CSR villages is presented in Figure 4.51. The analysis reveals that out of 4 CSR villages in core zone, only one village, namely, Bade Bhandar village has seeds & fertilizer distribution centre/kishan help centre. Distance of nearest seeds & fertilizer distribution centre/kishan help centre from the remaining villages ranges between 1 to 3.5 km. People of Chhote Bhandar village under Pusour Block are to travel minimum 1 km distance to avail the facility of seeds & fertilizer distribution centre/kishan help centre, which is located at Bade Bhandar, whereas people of Amla Bhouna village under Pusour Block are to travel minimum 3.5 km distance to avail the facility of seeds & fertilizer distribution centre/kishan help centre, which is located at Bade Bhandar.

None of 23 surveyed CSR villages in Buffer Zone-I have seeds & fertilizer distribution centre/kishan help centre. People of Jeveridih and Barpali villages under Pusour Block are to travel minimum 2 km distance to avail the facility of seeds & fertilizer distribution centre/kishan help centre, which is located at Bade Bhandar. Out of 39 CSR villages in Buffer Zone-II, only 2 have seeds & fertilizer distribution centre/kishan help centre. People of Bulaki, Tekka and Raitarai villages under Pusour Block are to travel minimum 2 km distance to avail the facility of seeds & fertilizer distribution centre/kishan help centre, which is located at Putkapuri.

Overall analysis of availability of agricultural cooperative society in surveyed CSR villages shows that out of 66 CSR villages, only three villages have seeds & fertilizer distribution centre/kishan help centre (Figure 4.52). In case of 58.93% of the remaining villages, people are to travel less than 5 km distance to avail such facility, whereas in case of 28.57% of the villages people are to travel 5-10 km distance and in case of remaining 12.50% of the villages people are to travel 10-20 km distance to avail such facility.

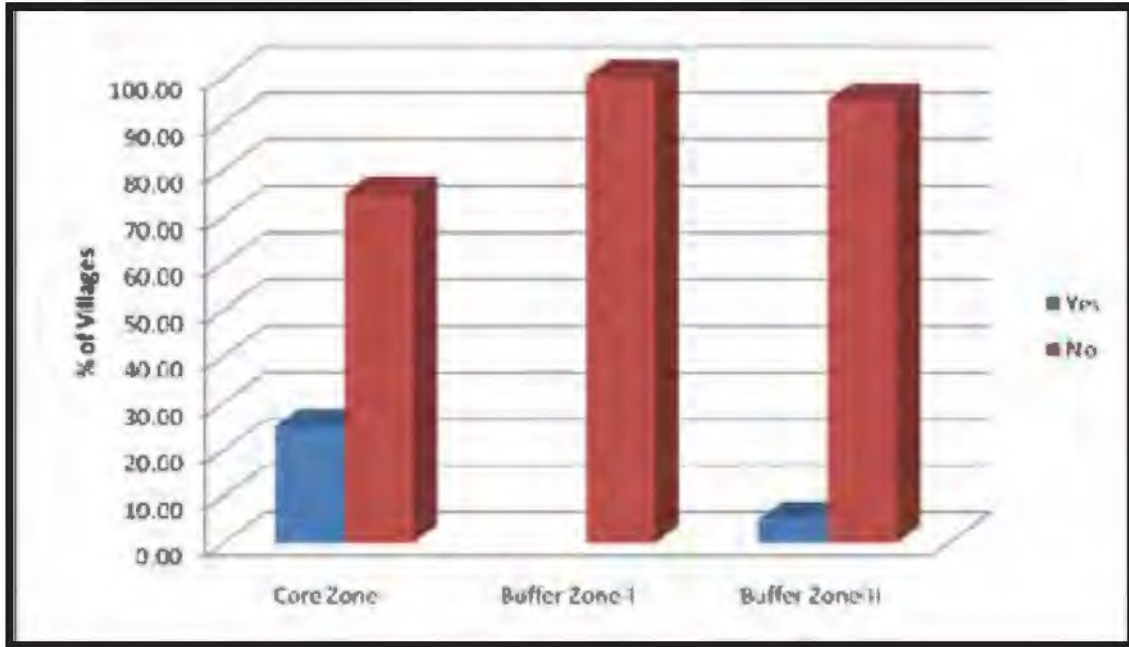
**TABLE 4.24: DISTRIBUTION OF SEEDS & FERTILIZER DISTRIBUTION CENTRE/KISHAN HELP CENTRE IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of CSR Villages Having Seeds & Fertilizer Distribution Centre/Kishan Help Centre		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	25.00	75.00	100.00	-	-	-
2	Buffer Zone-I	-	100.00	57.14	42.86	-	-
3	Buffer Zone-II	5.13	94.87	56.25	21.88	21.88	-
	<b>Total</b>	<b>4.55</b>	<b>95.45</b>	<b>58.93</b>	<b>28.57</b>	<b>12.50</b>	<b>-</b>

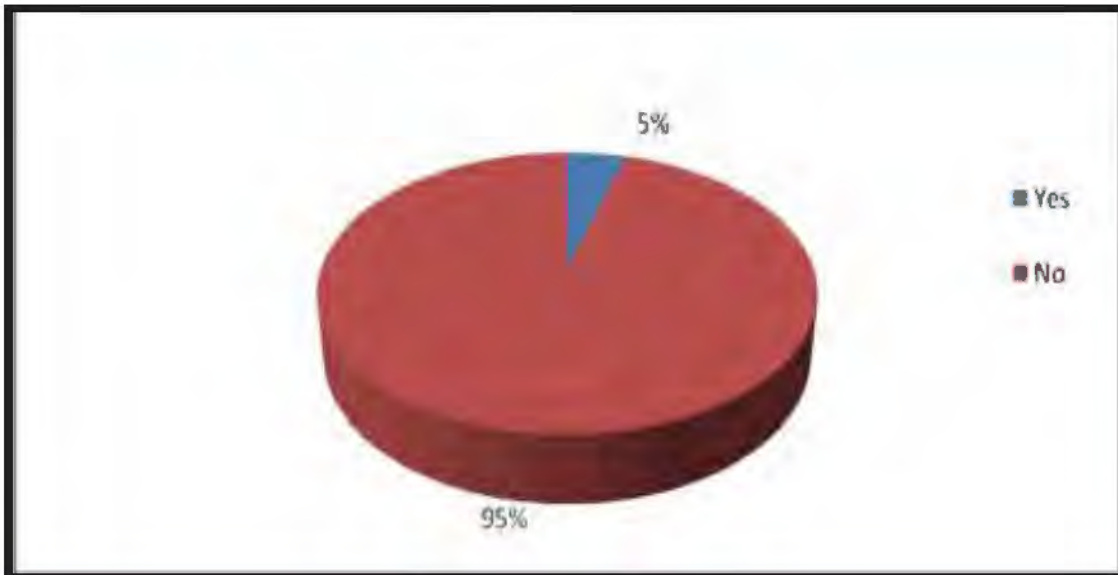




**FIGURE 4.51: AVAILABILITY OF SEEDS & FERTILIZER DISTRIBUTION CENTRE WITHIN CSR VILLAGES**



**FIGURE 4.52: OVERALL AVAILABILITY OF SEEDS & FERTILIZER DISTRIBUTION CENTRE IN CSR VILLAGES**



### 4.3.13 SOCIAL & INFORMATION DISSEMINATION CENTRE

Socio-cultural & Information dissemination activities among villagers require formal system for organizing the same. Availability of social & information dissemination facilities can be measured in terms of community hall available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest community hall; public library available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest public library.

#### Community Hall

Zone wise detail of availability of community hall in surveyed CSR villages is presented in the Table 4.25. The detail of availability of community hall in surveyed CSR villages is presented in Figure 4.53. The analysis reveals that out of 4 CSR villages in core zone, only one CSR village, namely, Amlī Bhouna has community hall. Distance of nearest community hall from the remaining villages ranges between 13 to 15 km. People of Bade Bhandar village under Pusour Block are to travel minimum 13 km distance to avail the facility of community hall, which is located at Pusour, whereas people of Chhote Bhandar village under Pusour Block are to travel minimum 15 km distance to avail the facility of community hall, which is located at Pusour.

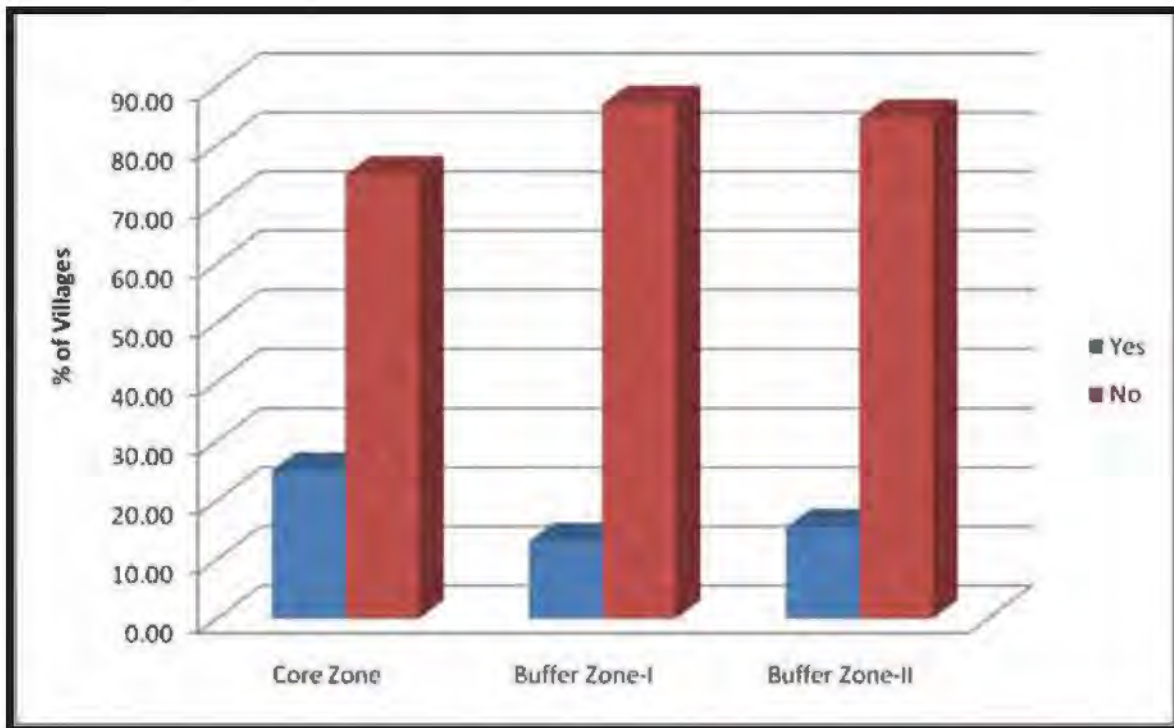
Out of 23 surveyed CSR villages in Buffer Zone-I, only three villages, namely Kotmara, Tilgi and Raibar villages under Pusour Block has community hall. People of Bonda village under Pusour Block are to travel minimum 1 km distance to avail the facility of community hall, which is located at Umri. Out of 39 surveyed CSR villages in buffer zone-II, 6 villages have community hall. People of Bulaki and Raitarai villages under Pusour Block are to travel minimum 2 km distance to avail the facility of community hall, which is located at Putkapuri.

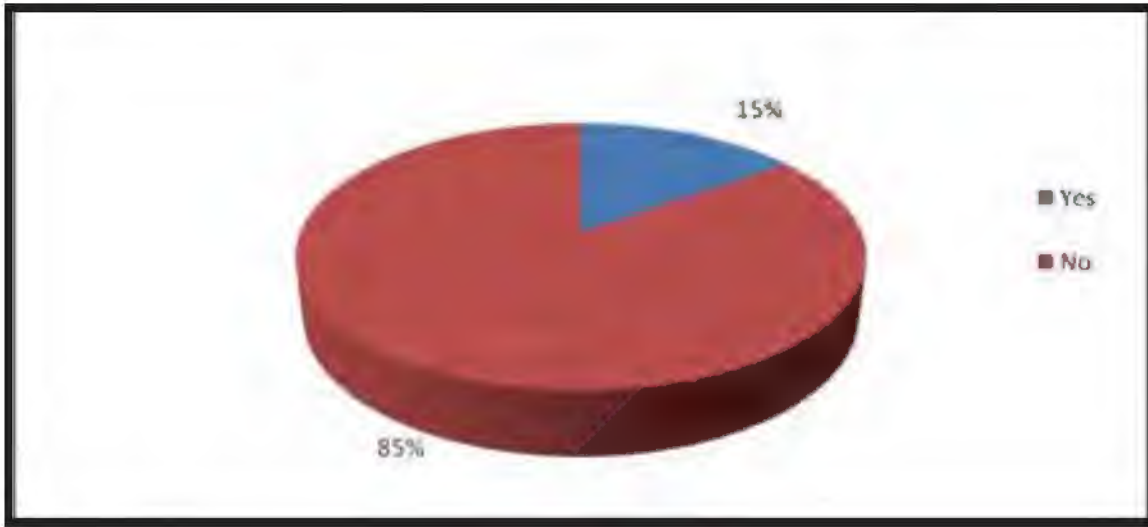
Overall analysis of availability of community hall in surveyed CSR villages shows that out of 66 CSR villages, 10 villages have community hall (Figure 4.54). In case of 26.92% of the villages, people are to travel less than 5 km distance to avail such facility, whereas in case of 19.23% of the villages people are to travel 5-10 km distance and in case of 48.08% of the villages people are to travel 10-20 km distance to avail such facility.

**TABLE 4.25: DISTRIBUTION OF COMMUNITY HALL IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of CSR Villages Having Community Hall		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	25.00	75.00	-	-	-	100.00
2	Buffer Zone-I	13.04	86.96	33.33	27.78	38.89	-
3	Buffer Zone-II	15.38	84.62	25.81	16.13	48.39	9.68
	<b>Total</b>	<b>15.15</b>	<b>84.85</b>	<b>26.92</b>	<b>19.23</b>	<b>48.08</b>	<b>5.77</b>

**FIGURE 4.53: AVAILABILITY OF COMMUNITY HALL WITHIN CSR VILLAGES**



**FIGURE 4.54: OVERALL AVAILABILITY OF COMMUNITY HALL IN CSR VILLAGES**

### Public Library

Zone wise detail of availability of public library in surveyed CSR villages is presented in the Table 4.26. The detail of availability of public library in surveyed CSR villages is presented in Figure 4.55. The analysis reveals that none of 4 surveyed CSR villages in core zone has public library. Distance of nearest public library from these villages is about 1.5 km. People of Amlhi Bhouna village under Pusour Block are to travel minimum 1.5 km distance to avail the facility of public library, which is located at Taparda.

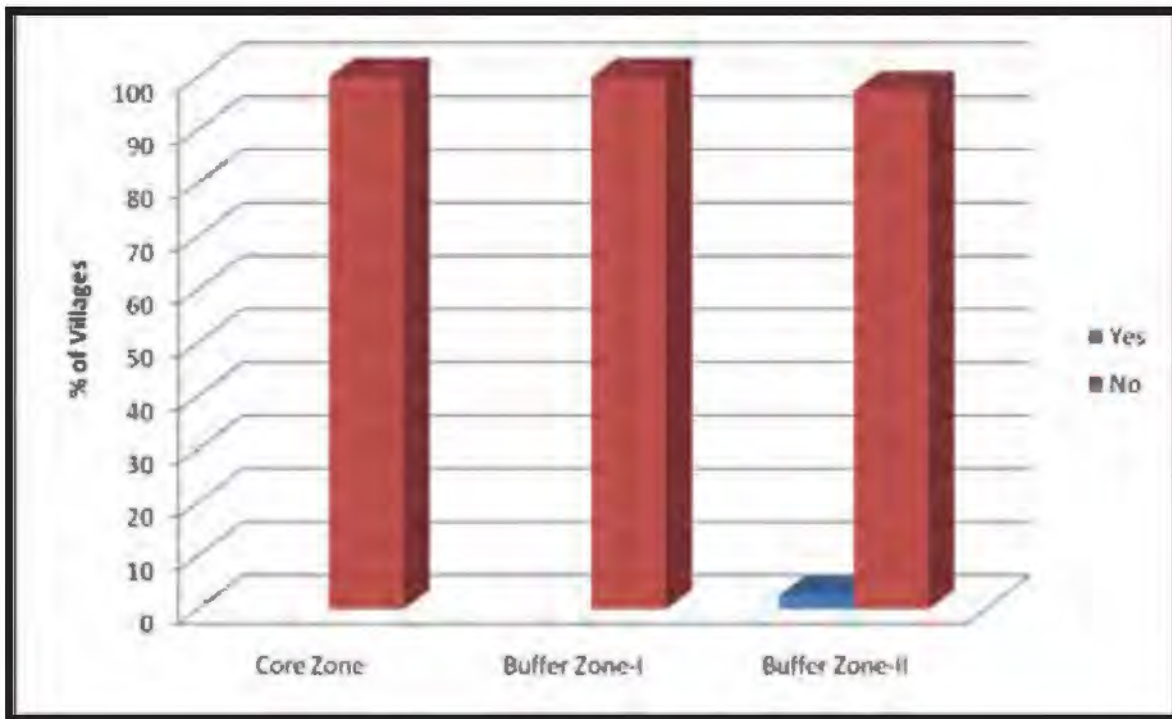
None of 23 surveyed CSR villages in buffer Zone-I has public library. People of Kathli village under Pusour Block are to travel minimum 500 m distance to avail the facility of public library, which is located at Taparda. Out of 39 CSR villages in Buffer zone-II, only one village, namely, Putkapuri has public library. People of Bulaki and Raitarai villages under Pusour Block are to travel minimum 2 km distance to avail the facility of public library, which is located at Putkapuri.

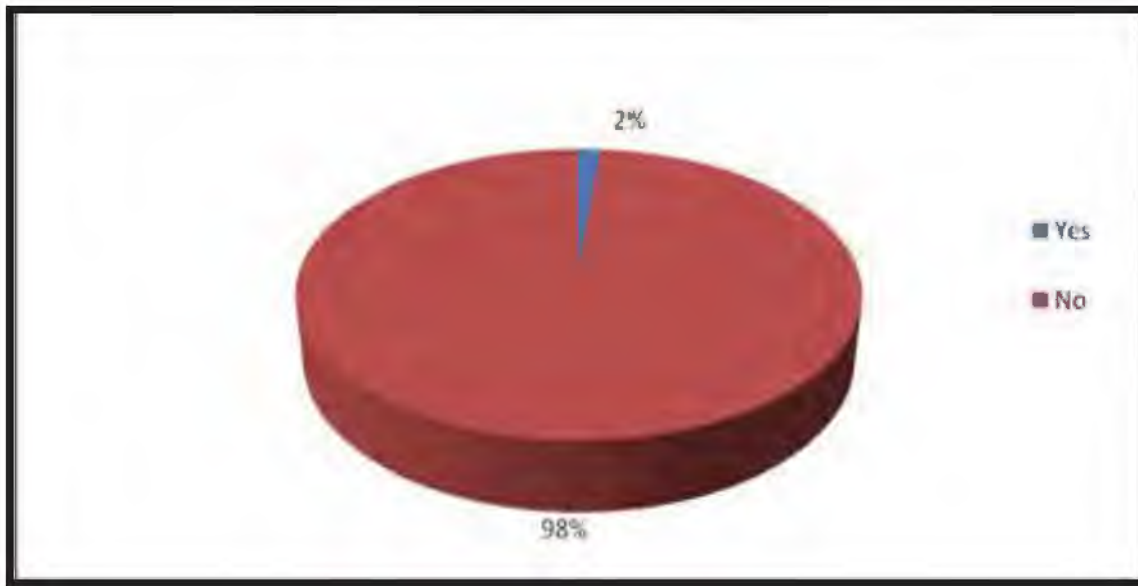
Overall analysis of availability of public library in CSR villages shows that out of 66 surveyed CSR villages, only one village has public library (Figure 4.56). In case of 22.22% of the remaining villages people are to travel less than 5 km distance and in case of 12.96% of the villages people are to travel 5-10 km distance to avail such facility.



**TABLE 4.26: DISTRIBUTION OF PUBLIC LIBRARY IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of CSR Villages Having Public Library		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	-	100.00	100.00	-	-	-
2	Buffer Zone-I	-	100.00	26.32	10.53	42.11	21.05
3	Buffer Zone-II	2.56	97.44	17.65	14.71	64.71	2.94
	<b>Total</b>	<b>1.52</b>	<b>98.48</b>	<b>22.22</b>	<b>12.96</b>	<b>55.56</b>	<b>9.26</b>

**FIGURE 4.55: AVAILABILITY OF PUBLIC LIBRARY WITHIN CSR VILLAGES**

**FIGURE 4.56: OVERALL AVAILIBLITY OF PUBLIC LIBRARY IN CSR VILLAGES**

### Personality Development Centre

Personality development is one of the basic needs for improving quality of life of local people. Availability of personality development facilities can be measured in terms of Yoga/Bayam centre available in CSR villages and if it is not available within CSR villages, minimum distance to travel to the nearest Yoga/Bayam centre.

Zone wise detail of availability of yoga centre in surveyed CSR villages is presented in the Table 4.27. The analysis reveals that none of 4 surveyed CSR villages in core zone has yoga centre. People of Bade Bhandar, Sarvani and Chhote Bhandar villages under Pusour Block are to travel minimum 22 km distance to avail the facility of yoga centre, which is located at Raigarh.

None of 23 surveyed CSR villages in buffer Zone-I has yoga centre. People of Chandli village under Dabhra Block are to travel minimum 3 km distance to avail the facility of yoga centre, which is located at Chandrapur. None of 39 CSR villages in Buffer zone-II have yoga centre. People of Raitarai village under Pusour Block are to travel minimum 2 km distance to avail the facility of yoga centre, which is located at Putkapuri.

Overall analysis of availability of yoga centre in CSR villages shows that none of 66 surveyed CSR villages have any yoga centre. In case of 12.50% of the villages people are to travel less than 5 km distance and in case of 55.36% of the villages people are to travel 10-20 km distance to avail such facility.



**TABLE 4.27: DISTRIBUTION OF YOGA CENTRE IN SURVEYED CSR VILLAGES**

Sl. No.	Zone	No. of CSR Villages Having Yoga Centre		If No, Distance (km)			
		Yes	No	< 5	5-10	10-20	>20
1	Core Zone	-	100.00	-	-	-	100.00
2	Buffer Zone-I	-	100.00	11.11	27.78	44.44	16.67
3	Buffer Zone-II	-	100.00	14.71	14.71	67.65	2.94
	<b>Total</b>	-	<b>100.00</b>	<b>12.50</b>	<b>17.86</b>	<b>55.36</b>	<b>14.29</b>



## 5.0 DETAIL OF CSR ACTIVITIES UNDERTAKEN

### 5.1 THRUST AREA OF CSR ACTIVITIES

Korba West Power Company Limited (KWPCCL) a 1X600 MW supercritical thermal Power plant has been acquired by Adani Power Limited in June 2019 and acknowledged as Raigarh Energy Generation Limited (REGL). As Hon'ble NCLT, Ahmedabad has approved the resolution plan submitted by Adani Power Ltd. for acquiring KWPCCL Vide order IA 236 of 2019 in C.P (I.B) No. 190/NCLT/AHM/2018 dated 24th June 2019 and subsequently Adani Power Ltd has taken over management of KWPCCL. KWPCCL had run CSR activities since from August 2008. Raigarh Energy Generation Limited-Adani Foundation (REGL-AF) a CSR arm of Adani Group, has taken over CSR activities of KWPCCL since 2019.

Adani Foundation (AF) was established in 1996 and is situated in Ahmedabad. It was set up to enhance the socio-economic condition of backward rural community under Corporate Social Responsibility (CSR) near the vicinity of the plant premises. It is a part of the prestigious Adani Group and looks after the CSR related activities of the group, which has now become synonymous with creating wealth for the people. Foundation was established with the vision to “accomplish passionate commitment to the social obligations towards communities, fostering sustainable and integrated development, thus improving quality of life”. Currently AF is working in Gujarat, Himachal Pradesh, Madhya Pradesh, Chhattisgarh, Maharashtra and Rajasthan, etc.

As per the APL CSR policy AF-REGL has undertaken various activities for providing sustainable livelihood and strengthening basic amenities & infrastructural facilities at villages of CSR zone REGL.

The major emphasis is being given in sustainable livelihood development and strengthening the educational facilities in terms of providing infrastructural supports at primary as well as the secondary schools of REGL CSR zone. Besides improving the infrastructural facilities at educational institutions, the study materials, scholarships, etc. were also provided. For undertaking the CSR activities at CSR zones, the emphasis were also given in improving drinking water and health, hygiene & sanitation facilities, etc. for villages of CSR zone.

As mentioned earlier, AF-REGL has already initiated the various social mitigation and development activities in core as well as buffer zone villages within the 10 km radius of the TPP. Subsequently, all the inhibited villages falling within 10 km radius of TPP i.e. 126 have been classified into 3 zones for undertaking CSR activities. The zone wise detail of villages along with their demographic profile is already presented in earlier chapters.



The AF-REGL is primarily focusing in four major thrust areas for socio-economic development in the vicinity of TPP under Raigarh District:

1. Education Facilities;
2. Community Health, Hygiene & Sanitation;
3. Sustainable Livelihood Development, and
4. Rural Infrastructure Development.

The need based annual action plan for undertaking CSR activities in the vicinity of TPP area is being formulated. The social process being followed for formulation of annual action plan as mentioned in subsequent section.

At village level first AF-REGL representatives attend Gram Panchayat meeting and introduce AF-REGL and its objectives and societal commitment. Social development process requires basic information of village which is being collected through baseline survey and PRA which is the best practice for the purpose and the same is being followed. The baseline survey includes all information about village demographic profile, natural resources, geographical knowledge, etc. Some key information and primary social issues are captured through PRA like social mapping, resource mapping, matrix ranking, etc.

Matrix Ranking is very important tool to find out problems and solutions by village community. As per need, AF-REGL prepares project with guideline like project planning, concept note, implementation strategy and outcome. This is in house process, then proposed developmental project is taken through Government Administration/Gram Panchyat/Education Dept./Health Dept./Agriculture Dept. as per requirement of project nature and type before implementation of the same.

At village level, Village Development Committee (VDC) is being formed with the approval of Gram Panchyat. VDC members are selected by village community and give them rights and power for planning and decision making regarding social development of the village. They help in project implementation and look after which project(s) going in right direction or not and monitor and evaluation of CSR activities. VDC's role is very effective in undertaking need based CSR Activities in the vicinity of TPP.

The major CSR activities being undertaken by AF includes:

#### **Education Facilities-**

- Navodaya coaching for 4<sup>th</sup> & 5<sup>th</sup> std students.
- E-Learning package distribution programme to Government schools.
- E-learning kit with Education Software provided to Anganwadis and primary School.
- Workshop for Anganwadi Sevika on using the software provided for E-learning kit.

- UDAAN Programme- Educational exposure visit to Adani Power Plant.
- English & Maths coaching classes.
- Goal setting workshop for High school students.
- Software module development training programme for Anganwadi.
- Road Traffic safety Awareness Programme in Schools.
- Sports Material Distribution to youth group
- Employee volunteering under education enhancement Programme
- Fire safety week Celebration with Schools
- Environment Day Celebration

#### **Medical Facilities-**

- Medical Dispensaries & MHCU
- General Medical Health camp in CSR villages
- Upgradation of Government Hospitals
- Poor Patient Assistance Programme
- Homeopathic Medical Treatment Camp
- Pulse polio vaccination camp support
- Street play on De-addiction awareness programme
- TSC (Total Sanitation Campaign) material support to CSR villages

#### **Sustainable Livelihood Development-**

- Sewing training center in CSR villages
- SRI cultivation in Kharif and Rabi season
- Vanmahotsav
- Cow based livelihood training programme
- Advance Tailoring Programme for Women
- Computer Training Programme
- Fly ash utilization training programme
- Seminar on opportunities in abroad for ITI Job aspirants
- Felicitation of women for promoting de-addiction in village
- Self-help group meeting in villages
- SAKSHAM- Adani skill development center
- Catering services training programme for sustainable development
- Livestock development Centre
- Kitchen Garden Seeds distribution programme
- Installation of Pre-Fabricated Bio-gas systems
- Improved Chulha programme.
- Water conservation

### Rural Infrastructure Development-

- Pond Deepening and Stream Cleaning Work
- Construction of low cost house.
- Provide drinking water facility in CSR villages
- Installation of seating benches at CSR villages
- Construction of farm pond at CSR villages
- Construction of classroom in CSR villages Schools

## 5.2 CSR STRATEGY OF REGL-AF

Foster relationship with the communities, stakeholders and build active long-term partnership for sustainable development by addressing extensively range of need-based issues like livelihood, health, education and infrastructure development in the framework of gender equity, social inclusion and good governance is the goal of community development program of REGL.

Creating values by transparent and ethical behaviour, establishing business links, safeguarding the environment, benchmarking performance, respecting and contributing to the society of which is overall CSR approach of REGL.

- Determine the need and aspirations of the communities and stakeholders in the vicinity of the plant,
- Long-term partnership with NGOs and agencies to create robust programs, and
- Build and strengthen community based institutions e.g. village development committee, self-help-groups, farmer's clubs etc. to address and sustain development initiatives.

### 5.3 CSR PROGRAMME COVERAGE

The REGL-AF follows the philanthropic scope of activities for sustainable community development. The Table 5.1 presents the CSR Programme matrix with sectors vis-à-vis the stakeholders covered under them.

**TABLE 5.1: CSR PROGRAMME MATRIX - INTERVENTION AND RELEVANT STAKEHOLDERS**

Sector	Strategic Focus	Interventions	Stakeholders
EDUCATION	Quality Improvement	Mobile library, Learn to read, Read to learn, cultural programs, activity based learning with primary school children  Science learning through Lab-in-box program, Promotion of sports and games for school children, placement of community teachers in government schools.	Children- Students , College going girls, Anganwadi Children and Staff, Parents, School Staff, School Management , Village Panchayat Representatives
	Infrastructure Supplementation	School Infrastructure Improvement, Drinking Water for School, Anganwadi Improvements.	
HEALTH, HYGIENE & SANITATION	Preventive Health and Diagnostics and Hygiene & Sanitation	Health Awareness Camps, Community Dispensaries, Organizing various activities in coordination with ICDS for service improvement at Aganwadi center- training to AWWs and helpers, updating growth monitoring chart, health education sessions, regularization of MangalDiwas, Godbharai etc., Strengthening of Mahtaripanchayat, Observed	Villagers , Children, Pregnant Women, School Children, Doctors, Mitanin, Victims of accidents, Patients, Village Panchayat Representatives

Sector	Strategic Focus	Interventions	Stakeholders
		National Nutrition Week, World Breast Feeding Week, National Girl Child Day, Support (tricycles, etc) to physically challenged persons, General health camps, Fogging in CSR villages for mosquito control, Supply of Mason and helper for construction of individual household toilets.	
	Curative Health and Emergency Services	MHCU and Extend services of OHC, Ambulance in emergency for local community, Malnutrition Intervention	
SUSTAINABLE LIVELIHOODS	Alternate Livelihood & Empowerment	Formation and strengthening of SHGs, Capacity building of SHG members on Functions of SHGs, accounts and book keeping, leadership training, Training and exposure visits on income generating activities like poultry farming, mushroom cultivation, Extension of revolving fund for income generating activities like poultry farming, mushroom cultivation, vegetable cultivation etc., Formation of women's cooperative society (registered under cooperative society's act) to run income generating activities, Tailoring training to women and girls, Farmers training on "SRI" and improved agricultural	Women, Unemployed Youth (men & women), Farmers, Disabled Individuals

Sector	Strategic Focus	Interventions	Stakeholders
		<p>practices, Promotion of "SRI" method for paddy cultivation. Skill training to youths on driving training, ITI training and construction skill training,</p> <p>Breed development of cattle through artificial insemination, Training to farmers on cattle management and feeding practices, Veterinary services in villages, Organization of veterinary camps for cattle, Promotion of nutritional supplements for cattle, Demonstration for fodder development in villages, Dairy development, Linkages with CG Milk Cooperative Federation for marketing of milk.</p>	
Rural Infrastructure Development	Improving availability of basic amenities and infrastructure facilities	<p>Deepening &amp; renovation of Ponds in villages, Bore wells with pumps for drinking water, Construction of water tanks, Construction of cement concrete roads in villages, Construction of Community centres, Construction of Sanskritik manch, Construction of class rooms, boundary wall of schools and Aganwadi Centre, Levelling of school ground, Support for construction of Temple, Construction of police transit hall, Repair of tribal hostel, Repair of solar lights of tribal hostels.</p>	<p>Villagers community, School-College Students &amp; Staff, Anganwadi Children and Staff, Parents, Tribal community Village Panchayat Representatives</p>

CSR activities commenced in the REGL CSR Zone since 2008-2009 is presented in Table 5.2.

**TABLE 5.2: DETAILS OF CSR ACTIVITIES UNDERTAKEN IN REGL CSR ZONE**

Sl No.	Interventions	List of activities undertaken
1	Rural Infrastructure Development	<ul style="list-style-type: none"> <li>- Deepening of Ponds in villages</li> <li>- Deepening, renovation of Pond and beautification in Raigarh Jaisinghtalab, Chandan talab at Pussore and Turki talab at Sarangarh</li> <li>- Bore wells with pumps for drinking water</li> <li>- Construction of water tanks</li> <li>- Construction of cement concrete roads in villages</li> <li>- Construction of Community centres- one completed, three under construction</li> <li>- Construction of Sanskritikmanch</li> <li>- Construction of boundary wall of schools and Aganwadi Centre</li> <li>- Levelling of school ground at Badebhandar HS School</li> <li>- Construction of pre-fabricated three room schools at village Sarwani</li> <li>- Support for construction of Temple at village Badebhandar</li> <li>- Construction of police transit hall at Jute mill thana, Raigarh</li> <li>- Repair of tribal hostel at Machida</li> <li>- Repair of solar lights of tribal hostels at Sarangarh and Barhamkela block</li> </ul>
2	Livelihood Enhancement	<ul style="list-style-type: none"> <li>- Formation and strengthening of SHGs (90 SHGs formed and strengthened),</li> <li>- Capacity building of SHG members on Functions of SHGs, accounts and book keeping, leadership training</li> <li>- Training and exposure visits on income generating activities like poultry farming, mushroom cultivation</li> <li>- Extension of revolving fund for income generating activities like poultry farming (38 poultry sheds), mushroom cultivation, vegetable cultivation etc.</li> <li>- Formed women's cooperative society (registered under cooperative society's act) to run income generating activities</li> <li>- Tailoring training to women and girls</li> <li>- Observed International women's Day</li> <li>- Farmers training on "SRI" and improved agricultural practices</li> <li>- Promotion of "SRI" method for paddy cultivation</li> </ul>

SI No.	Interventions	List of activities undertaken
		<ul style="list-style-type: none"> <li>- Skill training to youths on driving training, ITI training and construction skill training</li> <li>- Breed development of cattle through artificial insemination</li> <li>- Training to farmers on cattle management and feeding practices</li> <li>- Veterinary services in villages</li> <li>- Organization of veterinary camps for cattle</li> <li>- Promotion of nutritional supplements for cattle</li> <li>- Demonstration for fodder development in villages</li> <li>- Dairy development: 20 High yielding milch cattle given to 10 land seller families as an alternate livelihood</li> <li>- Linkages with CG Milk Cooperative Federation for marketing of milk</li> <li>- Formed Gram Vikas KamgarSahkariSamiti of Amalibhouna villagers</li> </ul>
3	Education support Program	<ul style="list-style-type: none"> <li>- Mobile library, Learn to read, Read to learn, cultural programs, activity based learning with primary school children (this was entry level program in partnership with PRATHAM executed from 2008 to FY2012)</li> <li>- Donation of 200 desks with chairs in Badebhandar HS School</li> <li>- Science learning through Lab-in-box program in 20 Govt. middle school children (in partnership with Agastya Foundation from 2012 to 2016)</li> <li>- Promotion of sports and games with school children of core villages</li> <li>- Placement of community teachers in government schools</li> </ul>
4	Community Health Program	<p>Organized various activities in coordination with ICDS for service improvement at Aganwadi center (from 2011 to 2014) –</p> <ul style="list-style-type: none"> <li>- training to AWWs and helpers</li> <li>- updating growth monitoring chart</li> <li>- health education sessions, regularization of MangalDiwas, Godbharai etc.</li> <li>- strengthening of Mahtaripanchayat</li> <li>- Observed National Nutrition Week, World Breast Feeding Week, National Girl Child Day</li> <li>- Distributed tricycles to 10 physically challenged persons (this was done in year 2011 as an compliance of public hearing)</li> </ul>



SI No.	Interventions	List of activities undertaken
		<ul style="list-style-type: none"> <li>- General health camps in project villages</li> <li>- Fogging in project villages for mosquito control</li> <li>- Extend services of OHC Ambulance in emergency for local community</li> <li>- Supply of Mason and helper for construction of individual household toilets</li> </ul>
5	Promotion of sports and culture	<ul style="list-style-type: none"> <li>- Organized football tournament, volley ball and Kabadditournament for the youths of project villages</li> <li>- Inter primary school sports meet organized for Govt. Primary schools of project villages</li> <li>- Donation for ChakradharSamarohorganized at Raigarh</li> <li>- Promote Culture of Giving: donation to orphanage center run by Missionaries of Charity at Raigarh</li> <li>- Donation for cultural programs in villages</li> </ul>
6	Response to disaster and emergencies	<ul style="list-style-type: none"> <li>- Relief activities during Flood</li> <li>- Fire tender on outbreak of fire in nearby villages</li> <li>- Ambulance during emergencies</li> </ul>

A MOA signed as an industry partner under Public Private Partnership for up-gradation of Govt. ITI Sariya, Raigarh district.

#### 5.4 PARTNERS IN DEVELOPMENT

CSR activities in the vicinity of TPP are being undertaken in association with various NGOs and other stakeholders. The prime partners in undertaking CSR activities is presented in Table 5.3.

**TABLE 5.3: PARTNERS IN UNDERTAKING CSR ACTIVITIES OF REGL**

NGO Partner	Program
Pratham	Education
Carndaksh	Livelihood Enhancement Program
Naandi Foundation	Mother & Child Health Program
Agastya Foundation	Education Support Program
BAIF Research Foundation	Livestock Development Program

REGL also collaborates and coordinates with district level government departments, financial and training institutions for strengthening the initiatives.

## 5.5 STATUS OF CSR ACTIVITIES UNDERTAKEN

The prime CSR activities undertaken includes:

- ❖ Since beginning of the project, app. Rs 21.60 Cr invested under Corporate Social Responsibility, spread in 76 villages of 43 panchayats covering app. 60 thousand population of Pussore block, Raigarh district and Dabhra block of Janjgir-Champa district,
- ❖ Rs. 6.52 Cr invested for community development in 17 tribal populated villages,
- ❖ 56 PAPs were trained in ITI fitter and electrician trade and given employment as operator in the plant,
- ❖ Three cooperative societies formed to engage villagers in alternate livelihood activities namely,
  - Gram Vikas Kamgar Sahkari Samiti - 85 PAPs are engaged through this society, carrying out housekeeping and green belt development work in the plant premises,
  - Dairy Cooperative Society - group of 25 dairy farmers linked with CG state dairy society for collection and marketing of the milk, app. 200 litres of milk sold per day,
  - Mahanadi Bahudesiye Sahkari Samiti – it is a women run society for various income generating activities,
- ❖ Developing infrastructure is essential for sustaining and multiplying growth of the society. Having the need and immediate expectations of the community, various infrastructure development activities undertaken in the villages –
  - 38 ponds were excavated in 29 peripheral villages enhancing the water catchment area of the existing pond,
  - Pond deepening and beautification were done for Jaisingh talab Raigarh, Turki talab, Sarangarh and Chandan talab, Pussore,
  - 63 bore wells with pumps were installed for safe drinking water in 44 villages and 36 water tanks constructed in 30 villages,
  - App. 32 km cement concrete road constructed in 48 villages to ease movement in the villages,
  - Construction of schools boundary wall, community sheds, table chairs in the school, repair of school hostels, etc. were executed in villages,
- ❖ Livelihood and Skill Enhancement –

- SHGs - 1078 women associated with 99 SHGs, formed cooperative society
  - Best Agricultural Practices – SRI, vegetable promotion, mushroom production
  - Livestock development – app. 900 farmers trained, >4000 cattle treated in 42 vet camps, breed dev. (240 Cross Breed calves born). dairy promotion (app.150 lit. milk collected and sold every day)
  - Skill development – ITI training(58nos.), Driving training(67nos.), construction skill training (20nos.), tailoring training (502), poultry farming(37nos.); Total 684 trained
  - Cooperative society (Gram Vikas) formed to engage PAPs – 93 persons engaged
- ❖ Education support program –
- Remedial Classes for primary school children – community sensitization program
  - > 2500 school children from 20 Govt. Middle Schools benefitted from activity based science learning program
  - Sports and games with school children
  - Placement of community teachers in Govt. High Schools on district admin directives
- ❖ Community Health Care program –
- Impacted 5163 mothers, children and adolescent girls of 78 AWCs in 50 villages
  - > 1000 Patients received treatment in health check-up camps
  - Fogging – measures to control mosquito borne diseases in 4 villages
  - Financial support for critical illness to the most needy people on request
  - Extended services of Ambulance in emergencies for community
- ❖ Cultural and sports promotion –
- Sports and games promoted among local youths – organized Football, Volleyball, Kabbadi tournament
  - Community Connect – attended religious functions in the villages
  - Contributed to cultural programs organized by district administration

REGL received awards and accolades from Think India and India CSR for “Livelihood project” and “women’s empowerment”. District Administration also recognized REGL contribution towards its support to Chakradhar Samaroh and response to flood relief and activities.

The brief detail of the CSR activities undertaken during the present social audit period (2020-21 to 2022-23) is presented in subsequent sections:

### 5.5.1 Educational Facilities

REGL believes education to be the key to empowerment. And that the children have a right to quality education. For this, multi-fold activities are undertaken in the schools of peripheral villages.

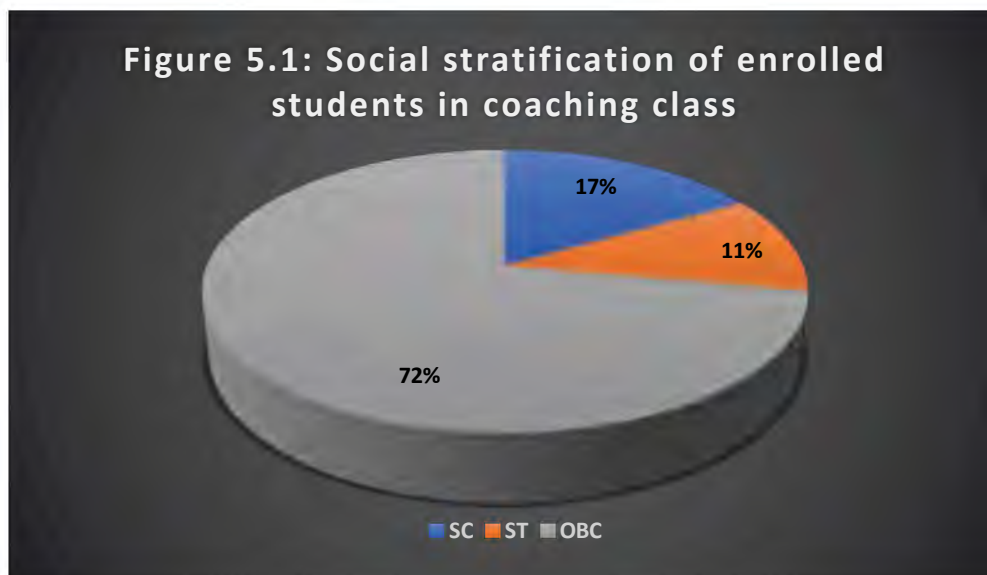
- **Implementation of project Utthan:** This ambitious project supported by Adani foundation is an attempt to reduce the dropout rates, tutor priya vidyarthi (progressive learners) in schools and work together to increase staff capability. In order to improve children's basic literacy and numeracy skills, it has also mobilized the support of teachers and parents, particularly mothers. In the project area, Utthan was launched in January, 2023 with the objective of covering 5 primary schools and 3 middle schools across Bade Bhandar, Chote Bhandar, Jeviridih, Kathli, Amlibhauna and Sarwani. As on date, the project has already been initiated in a middle school in Kathli.
- **Free coaching classes:** In Pusaur block, students are given free coaching classes in order to train them to perform better in different competitive exams. Currently, 35 students are enrolled in the program among which 6 students are from selected CSR villages and the rest are from nearby villages.
- **Training on self-defence:** The Kabaddi training program for girls was launched in October, 2022 in 5 schools among which 2 are from Bade Bhandar and one each from Supa, Bunga and Kathli. The program is targeted at age group of 14-17 to popularize sports activities among women and also train them in different self-defence mechanisms. The training program is conducted in a session of three months and 30 girls are trained per batch. These girls are chosen based for the training based on a selection test and are provided with proper nutrition throughout the course of training.
- **Installation of drinking water facility:** One 80 litre RO water filter has been installed in a high school of Bade Bhandar to provide safe clean and safe drinking water facility.
- **Organization of school health camps:** The school health camps are being organized in 4 high schools of selected CSR villages for both boys and girls once a month.

**Coaching centre:** The AF-REGL is conducting free coaching classes at the Youth centre of Borodipa village under Pusore block for students who are eligible to take part in different competitive examinations for government jobs. The initiative has been taken up to support students coming from poor financial background. Village wise details of enrolled students in coaching class is

presented in Table 5.4. The analysis reveals that out of the total 36 enrolled students, 6 students are from 2 selected CSR villages ie. 4 from Bunga and 2 from Jevridih. The status of social stratification of enrolled students is presented in Figure 5.1 which further reveals that 72% students fall under OBC category, 17% students are from SC category and 11% students are from ST.

**TABLE 5.4: STATUS OF YOUTHS ENROLLED IN COACHING CLASS FOR PREPARATION OF GOVERNMENT JOB COMPETITIVE EXAMS CONDUCTED BY AF-REGL**

Sr. No.	Village	Gram Panchayat	Category		
			SC	ST	OBC
1	Amapali	Amapali	0	0	2
2	Baghadola	Baghadola	2	0	4
3	Bodajhariya	Kandagarh	0	0	1
4	Bonda	Bonda	0	1	0
5	Bunga	Bunga	0	1	3
6	Chhote Haldi	Chhote Haldi	0	0	1
7	Dumarpali	Dumarpali	0	0	1
8	Gotma	Gotma	0	0	6
9	Jevridih	Chhote Bhandar	2	0	0
10	Kondatarai	Kondatarai	0	1	0
11	Kosmanda	Kosmanda	1	0	0
12	Kotasura	Kotasura	0	0	1
13	Mahloi	Mahloi	0	0	1
14	Odekela	Odekela	0	1	0
15	Sarasmal	Karrajor	1	0	1
16	Surri	Surri	0	0	3
17	Thakurpali	Gotma	0	0	1
18	Tinmini	Tinmini	0	0	1



**Eye screening and testing camp:** AF-REGL conducted an eye screening and testing camp as on February 27, 2022 at Government High School, Bade Bhandar. Village wise detail of beneficiaries is presented in Table 5.5. The analysis reveals that in total, 433 beneficiaries received treatment in the camp out of which 338 were from 15 selected CSR villages. The analysis further indicates that out of the selected CSR villages, majority of the patients came from Bade Bhandar (90) followed by Bunga (61). The gender wise distribution of beneficiaries is depicted in Figure 5.2. The analysis reveals that out of the total beneficiaries, 59.35% are male and 40.65% are female.

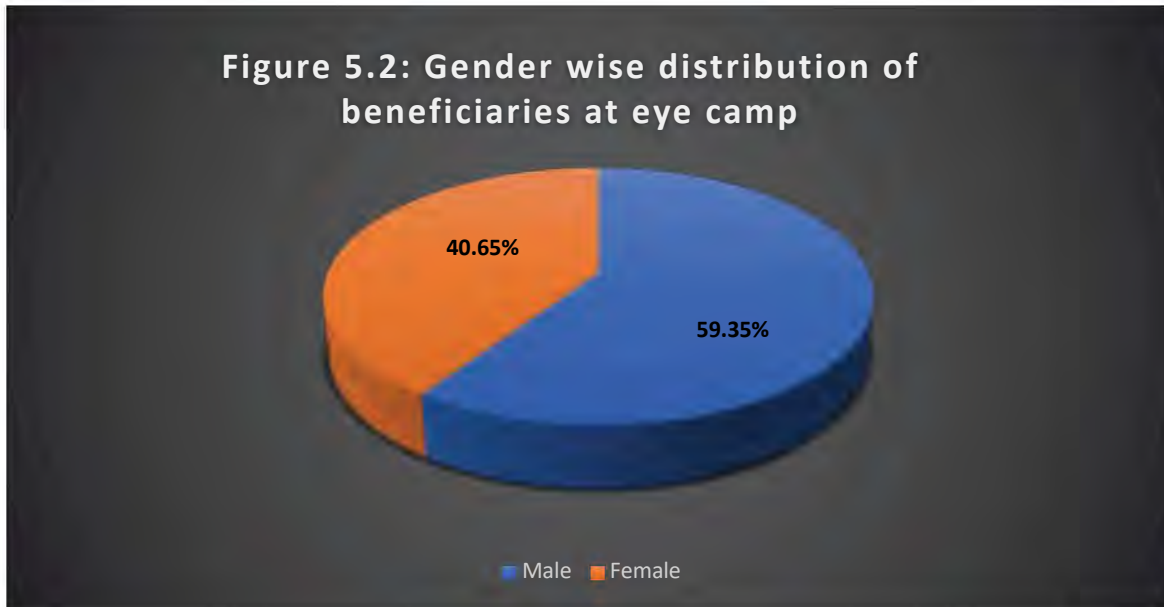
**TABLE 5.5: VILLAGE WISE STATUS OF BENEFICIARIES OF EYE CAMPS FOR SCHOOL CHILDREN**

Sr. No.	Village Name	Gram Panchayat	Total	Gender	
				Male	Female
1	Amlibhouna	Chhote Bhandar	10	6	4
2	Bade Bhandar	Bade Bhandar	90	48	42
3	Barpali	Barpali	14	10	4
4	Bunga	Bunga	61	40	21
5	Chandli	Chandli	2	1	1
6	Chhote Bhandar	Chhote Bhandar	18	10	8
7	Jevridih	Chhote Bhandar	5	2	3
8	Kalma	Kalma	5	3	2
9	Kathli	Taparda	19	7	12
10	Kotmara	Kotmara	13	11	2
11	Ranbhatha	Ranbhatha	35	15	20
12	Sarwani	Barpali	4	1	3
13	Supa	Supa	36	18	18
14	Taparda	Taparda	22	15	7
15	Tupakdhar	Taparda	4	3	1



Sr. No.	Village Name	Gram Panchayat	Total	Gender	
				Male	Female
16	Other Villages	Other Villages	95	67	28
<b>Grand Total</b>			<b>433</b>	<b>257</b>	<b>176</b>

Source: Govt. H.S. School, Bade Bhandar



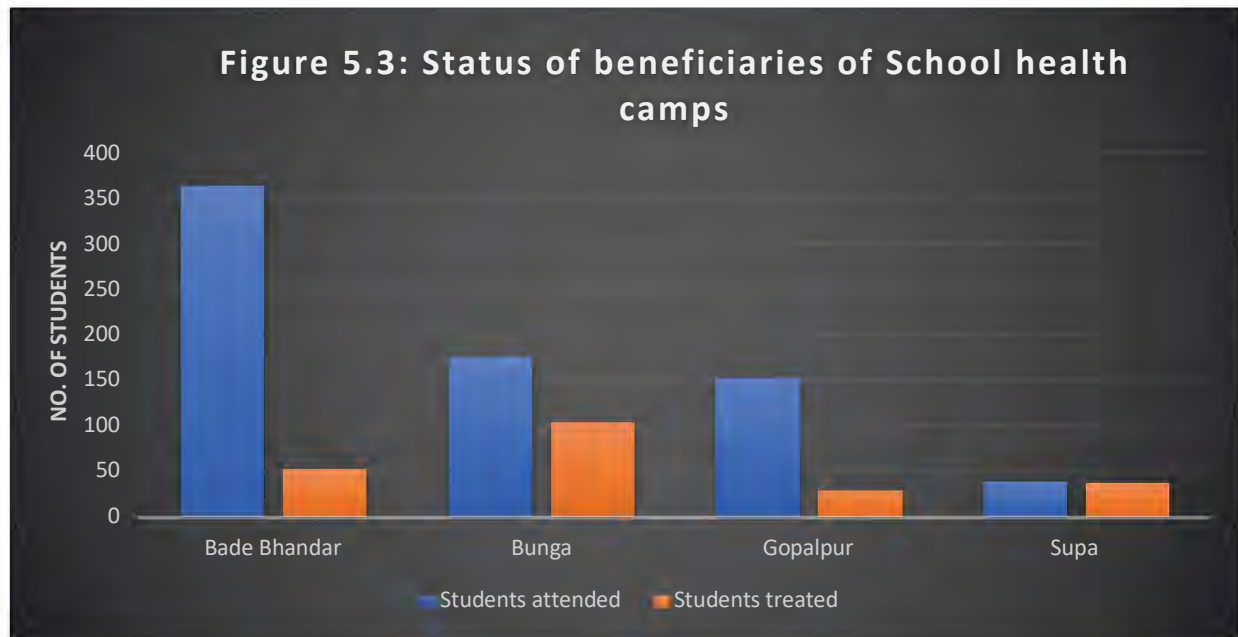
**School Health camp:** Different health awareness camps were organized on menstrual and personal hygiene among school students while giving special emphasis of health and well-being of adolescent girls. The camps were organized in different schools of selected CSR villages. School wise status of health awareness camps is presented in Table 5.6. The analysis reveals that 732 students attended the program out of which 222 got treated and majority of the school health camps were conducted in Bunga (3). Status of beneficiaries of the health camps is depicted in Figure 5.3. The analysis indicates that majorly (49.73%) students attended the health camp from Bade Bhandar whereas maximum students from Bunga got treated in the camp (46.85%).

**TABLE 5.6: STATUS OF HEALTH AWARENESS CAMPS CONDUCTED BY AF-REGL IN SCHOOLS OF SELECTED CSR VILLAGES**

Sr No.	Gram Panchayat	No of students attended	No of students treated
1	Bade Bhandar	364	52
2	Bunga	176	104



Sr No.	Gram Panchayat	No of students attended	No of students treated
3	Gopalpur	153	29
4	Supa	39	37
<b>Total</b>		<b>732</b>	<b>222</b>



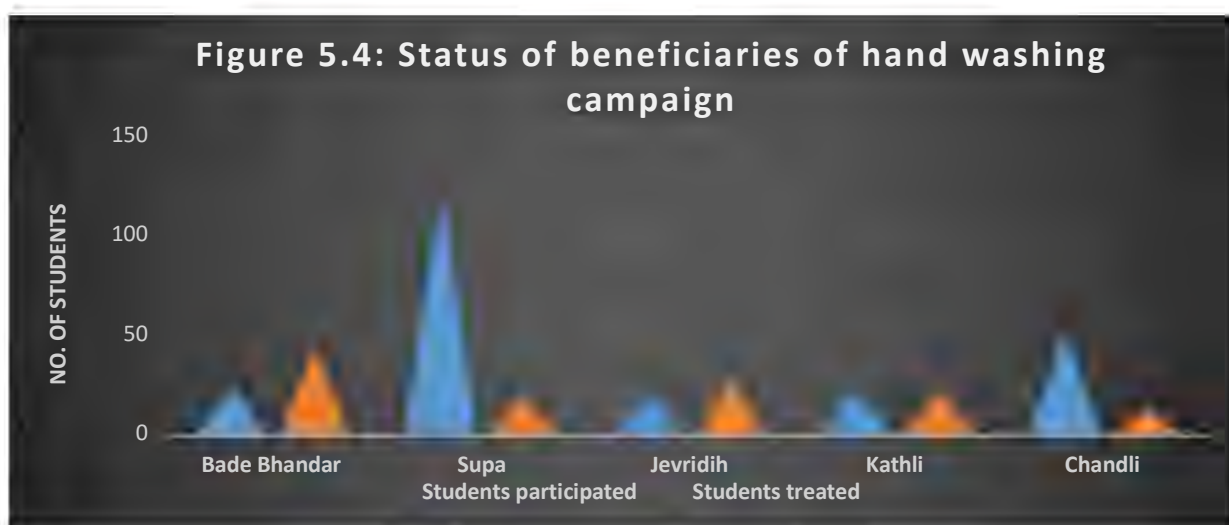
**Hand washing day:** The hand washing campaign was organized in few schools of selected CSR villages to encourage and mobilise students to improve their hand washing habits on the occasion of Global Hand Washing Day. The campaign focussed on spreading awareness regarding the importance of hand washing and consultations/treatments were provided for those suffering from hygiene related issues. The village wise detail of hand washing campaigns is presented in Table 5.7. The analysis reveals that total 5 campaigns were organized in selected CSR villages in which 259 students participated and 140 students were treated in total. The status of beneficiaries of hand washing campaign is depicted in Figure 5.4. The analysis indicates that although maximum number of students attended the campaign in Supa (50.19%), majority of students were treated in Bade Bhandar (34.29%).





**TABLE 5.7: STATUS OF HAND WASHING CAMPAIGNS BY AF-REGL IN SCHOOLS OF SELECTED CSR VILLAGES**

Sr. No	Village Name	Gram Panchayat	Participated People	Total Treated
1	Bade Bhandar	Bade Bhandar	26	48
2	Supa	Supa	130	22
3	Jevridih	Chhote Bhandar	23	31
4	Kathli	Taparda	25	24
5	Chandli	Chandli	55	15
<b>Total</b>			<b>259</b>	<b>140</b>



### 5.5.2 Sustainable Livelihood Development

Creating sustainable livelihood options of the communities residing in the peripheral villages is the key program focus that the REGL works with. The sustainability of livelihoods becomes a function of how men and women use asset portfolios on both a short and long-term basis. REGL employs an asset-based and skill-based approach, emphasizing the promotion of people's access to and sustainable use of the assets upon which they rely as central to poverty reduction.

The intervention ranges from agriculture intensification and management to vocational training, farm based and off-farm microenterprise development. This includes providing training, credit support, market linkages, encourage savings, building institutions and extend support till the communities gain confidence. The village wise detail of intervention made under diversified CSR activities are presented in Annexure 5.1.

### **Village Level Institutions**

REGL focuses on the development of village level institutions to extend its livelihood enhancement initiatives. The village level institutions include women Self-Help-Groups (SHGs), Kissan Clubs, Cooperative Society and Village Development Committees.

REGL gives attention to the women because they are found to be the most marginalized and the most vulnerable category when studied on the index of poverty, availing opportunities, literacy and health. Yet it is the women who prove to be the most effective in fostering change in their families and communities.

Similarly formation of Kissan Clubs has been taken up to associate large number of farmers to disseminate farmer's friendly and scientifically proven techniques for crop production and management, credit support from bank, awareness and capacity building.

### **Skill Development Trainings**

REGL supports various skill developments training for unemployed youths as per their interest and educational qualification. More than 300 youths have received vocational training on various trades, enabling them to pursue better and more paying employment opportunities. ITI trained youths from Project Affected Families (PAFs) are being given employment in the power plant. The MOU for partnership with ITI Saria is in process under Public Private Partnership (PPP) as an industry partner.

REGL is executing such training in collaboration with various technical training schools like Agrasen Industrial Training Centre, OP Jindal Community College, Indu Motor Driving Training School and Govt. Polytechnic College, Raigarh etc.

The Adani skill development center (ASDC) is located in Bade Bhandar which gives women the opportunity to get trained in the SET (Self Employed Tailor) course. Discussion with the trainees at ASDC revealed the following:

- It is a three months course in which 30 students are enrolled to get trained as tailors.
- AF-REGL charges Rs.500 from each trainee at the beginning to make their uniforms. No additional amount is charged as course fee.
- For the training purpose, AF-REGL provides necessary sewing machines and materials for the initiation of training.
- Among the trained students, few highly skilled women are selected to build a different group in the ASDC known as "Darzee."
- Tailors in the "Darzee" are professionals who take bulk orders and are involved in making dresses, bags, mobile covers, cushion covers their monthly income varies from Rs.5k-10k. They work as a SHG and all the cloth materials are bought by them.

- They prepared 913 flags for the initiative of “Har Ghar Teeranga” on last Independence Day. Currently, they are involved in making shirts for the workers in Adani.
- The workers in Darzee are interested to work as a team since they require support to complete such big orders.
- Material cost for lehenga and shirt is approximately RS.50 and 45 respectively and the stitching cost is around Rs.250. However, some workers have mentioned that due to rise in material cost, they are finding it difficult to purchase the same at affordable rate.
- All the profit from “Darzee” is used for further expansion of business.
- Srishti Pradhan, a member of Darzee group is engaged with the work since last year. She has mentioned her biggest motivation to join the course was to become financially independent and to be able to contribute towards her family. She has received full support of her family members from the beginning for which she has been able to become such a highly skilled tailor at present.
- Interaction with several trainee revealed that while many are interested to work in a group on successful completion of training, some are interested to open their shops to work independently.

Pragati Patel, a trainee of SET course who has completed her post-graduation in Zoology is highly ambitious and motivated. After acquiring necessary skill set, she wishes to open her own boutique and also provide training to interested candidates.

FIGURE 5.5A: SET COURSE UNDERTAKEN BY LOCAL YOUTH OF SELECT CSR VILLAGES AT ASDC BADE BHANDAR

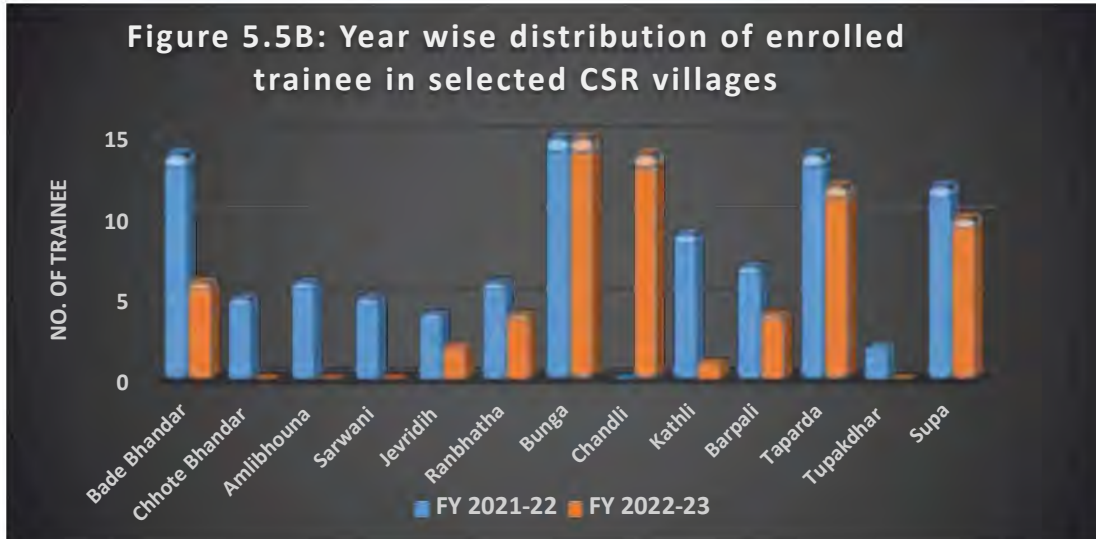


**SET course:** Skill development training is being provided to women in order to generate employment. The self-employed tailor (SET) course is conducted batch wise for the duration of three months in the Adani Skill Development Center (ASDC) located in Bade Bhandar . Each batch consists of nearly 30 students who get hands on training in order to master the tailoring skills. Details of village wise status of enrolled students for the above mentioned course is presented in Table 5.8. The analysis reveals that till now total 210 students were enrolled who have completed/undergoing the training program. Out of the total enrolled trainee, 79.52% women are from selected CSR villages. Year wise distribution of enrolled trainee from selected CSR villages is depicted in Figure 5.5B. The analysis indicates that for both the years ie. 2021-22 to 2022-23, the number of enrolled trainee were maximum in Bunga while there were no enrolled students from Chandli in 2021-22 and no enrolled students from Chhote Bhandar, Amalibhauna and Sarwani in 2022-23.

**TABLE 5.8: VILLAGE WISE STATUS OF ENROLLED TRAINEE FOR SET COURSE**

Sr. No.	Village Name	Gram Panchayat	FY 21-22	FY 22-23	Total
1	Bade Bhandar	Bade Bhandar	14	6	20
2	Chhote Bhandar	Chhote Bhandar	5	0	5
3	Amalibhouna	Chhote Bhandar	6	0	6
4	Sarwani	Barpali	5	0	5
5	Jevridih	Chhote Bhandar	4	2	6
6	Ranbhatha	Ranbhatha	6	4	10
7	Bunga	Bunga	15	15	30
8	Chandli	Chandli	0	14	14
9	Kathli	Taparda	9	1	10
10	Barpali	Barpali	7	4	11
11	Taparda	Taparda	14	12	26
12	Tupakdhar	Taparda	2	0	2
13	Supa	Supa	12	10	22
14	Other villages		11	32	43
<b>Total</b>			<b>110</b>	<b>100</b>	<b>210</b>



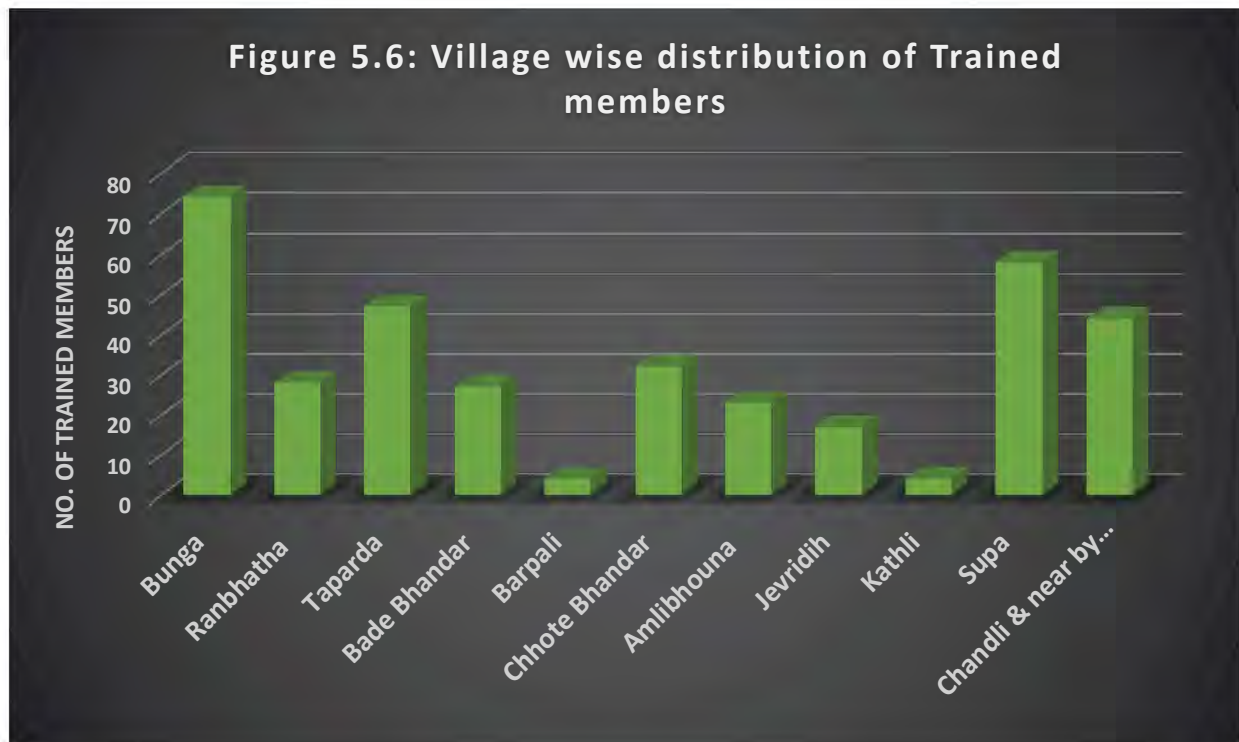


**Training on Book/Record Keeping:** In order to increase the efficiency of SHGs, AF-REGL organized training on book/record keeping during the period November 2021-February 2022. One or two members of each SHG from different selected CSR villages participated in the training program. Village wise details of participated SHGs is presented in Table 5.9. The analysis reveals that in total 358 members from 155 SHGs of 12 selected CSR villages participated in the training program. Analysis of distribution of trained members (Figure 5.6) reveals that majority of the members (20.67%) from Bunga completed the training program.

**TABLE 5.9: VILLAGE WISE STATUS OF SHGS FOR BOOK/RECORD KEEPING TRAINING**

Sr. No.	Village Name	Gram Panchayat	Participated SHG	Trained Member
1	Bunga	Bunga	31	74
2	Ranbhatha	Ranbhatha	13	28
3	Taparda	Taparda	20	47
4	Bade Bhandar	Bade Bhandar	10	27
5	Barpali	Barpali	2	4
6	Chhote Bhandar	Chhote Bhandar	12	32
7	Amlibhouna	Chhote Bhandar	12	23
8	Jevridih	Chhote Bhandar	6	17
9	Kathli	Taparda	3	4
10	Supa	Supa	19	58
11	Chandli & near by villages	Chandli	27	44
<b>Total</b>			<b>155</b>	<b>358</b>





### Mushroom Production

Mushroom Production promoted through SHGs with the women members in the villages as farm-based enterprises. The activity is low cost, less labour intensive and has ample market potential. The women were given training and exposure visit in coordination with Krishi Vigyan Kendra (KVK) and other expert agencies.

The interested self-help groups (SHGs) from the selected CSR villages are being trained in the area of mushroom cultivation as a means of sustainable livelihood (Figure 5.7A). During the field visit, interaction with the SHGs took place at the meeting of Mushroom Sikhar Bhandar (monthly meeting of the SHGs who are involved in mushroom cultivation) held at the Gothan of Supa village. The discussion with the several members of the SHGs revealed the following:

- Out of 10-12 members constituting each SHG, around 5 members are selected who show interest towards participation in the training program. All the profits earned is shared only among the participating members of the SHG. At present 15 SHGs are involved in the program.
- Majorly two types of mushrooms are cultivated ie.a) Oyster b) Paddy Straw. The oyster can be further classified into three varieties- i) Blue oyster ii) Florida or White oyster and iii) Sajar Kaju or black oyster.



- The cultivation of oysters starts from October end to March end after which two months is allotted to prepare for the cultivation of paddy straw that is done during the period from June-September.
- In the initial stage, each SHG is provided with 40 kg spawns brought at the rate of Rs 100/Kg which comprises of oysters and paddy straw along with other materials such as polythene bags, chart powder, straw bundles etc.
- The oysters are sold at the rate of Rs 120-150/Kg and for the paddy straw the rate may vary from Rs 240-350/Kg.
- The white oyster has several medicinal uses and can be processed further to make mushroom powder and pickles. The black oyster and paddy straw have high demand in the market since they have delectable taste.
- Many of the SHGs cultivate mushrooms in a separate room in their own house. However, some face problems due to space constraint in their homes and hence have to travel long distances from one village to another to reach the common point where cultivation is done together along with other members.
- The SHGs sell the mushrooms by approaching people door to door and spreading awareness regarding the benefits and taste of the same. The mushrooms are further sold by circulating whatsapp status to increase the reach to customers.
- In case of unsold mushrooms, they are reprocessed further and packaged in containers. In some scenarios, they are often taken to the nearby blocks or else any one or 2 members of the organization are given the responsibility to take the total amount of unsold mushrooms and sell them to the nearby Mandi. The profit later on is then distributed among themselves.
- Almost all the members have shown high to very high willingness to continue in this program.
- The women developed interest to join the training after becoming aware of the importance of mushroom industry from community mobilizer Somparabha Goswami and members of the Adani Foundation.
- Their main motivation was to try something new apart from their regular household chores that will pave the way for them to become financially independent.
- Most of them have mentioned the boost in their self-confidence after joining the program since they believe that they are capable to make monetary contributions in their family.
- They are all being supported by their family members that help them to stay motivated in their work and overcome any challenges they face.
- Mostly women prefer cultivation of paddy straw since the process is lengthy and women get adequate time to manage both household work as well as mushroom cultivation effectively.

AF-REGL is providing training to the interested members of different SHGs on mushroom farming as a form of sustainable livelihood. Details of SHGs involved in the training program for the period 2021-22 is presented in Table 5.10. The analysis reveals that the training was conducted from 7<sup>th</sup> to 11<sup>th</sup> February 2021 in Chhote Bhandar and Jeviridih. The study further reveals that 23 SHGs



consisting of 65 members participated in the training. Village wise distribution of trainee is demonstrated in Figure 5.7B. The study indicates that majority of the SHG members from Jevridih (38.46%) participated in the program.

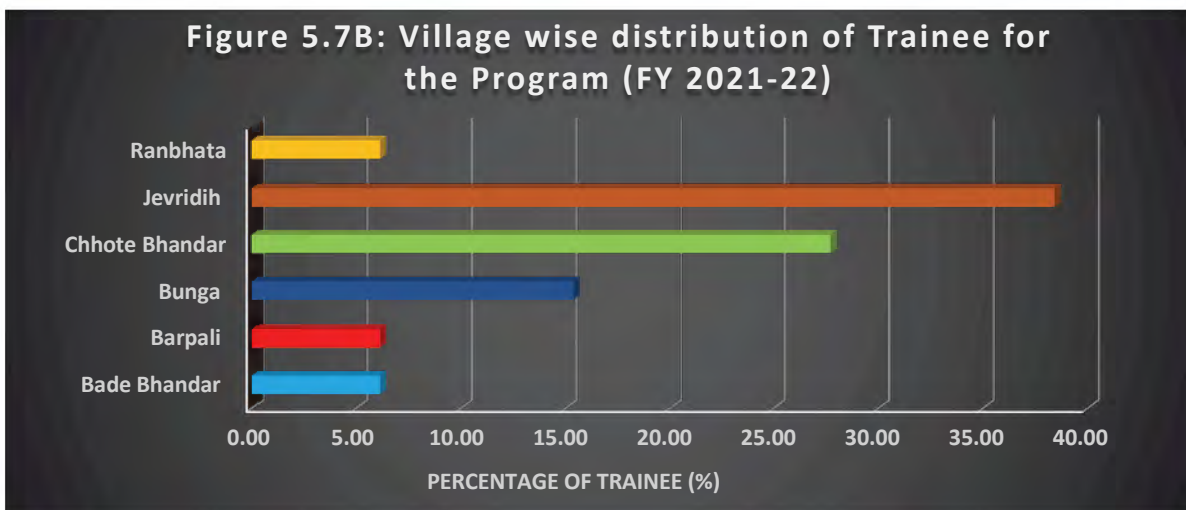
**TABLE 5.10: STATUS OF SHG MEMBERS FOR MUSHROOM CULTIVATION TRAINING (FY 2021-22)**

Sr. No.	Village Name	No. of SHG	Trained Member
1	Bade Bhandar	1	4
2	Ranbhata	2	4
3	Bunga	4	10
4	Chhote Bhandar	7	18
5	Barpali	3	4
6	Jevridih	6	25
	<b>Total</b>	<b>23</b>	<b>65</b>

**FIGURE 5.7A: TRAINED SHGs INVOLVED IN MUSHROOM PRODUCTION AT SELECT CSR VILLAGES**



**Figure 5.7B: Village wise distribution of Trainee for the Program (FY 2021-22)**



This, on one hand, will develop self-reliance among the rural women and save them from tiring manual labor, and on the other hand, will provide them with more opportunities for cultural, societal and technical education in improving the quality of family and community life by income generation. This activity has potential to expand with continued handhold; there is good market of the product. The produced product was sold locally and at Raigarh at good rate.

### **Vegetable Cultivation**

AF-REGL is providing training to the interested members of different SHGs on vegetable cultivation as a form of sustainable livelihood.

The program has been launched recently in October 2022. Currently, 8 members of 5 SHGs are involved in the program (Figure 5.8A). Discussion with workers revealed the following:

- The program is conducted at the Gathan of Supa GP by the joint support of government that has provided land to the cultivators, AF-REGL which provides assistance regarding tomato cultivation and the involved workers from different SHGs who invests on different equipments and other necessary things required for cultivation.
- AF-REGL has provided the workers with tomatoes, facilities for drip irrigation, pipes, pesticides, threads etc.
- Currently they have planted 10,000 tomato plants and it is predicted that 8kg tomatoes can be produced from each plant.
- It is estimated that by end of each year, the SHGs combined can earn upto 2-6 lakhs in total.
- Earlier they were also engaged in cultivation of potatoes and onions .1.4 acre land in total is used for vegetable cultivation.
- Income for cultivation of onions and potatoes varied from Rs. 15000-22000 per SHG for each production cycle.
- The workers are highly motivated to continue their work and have started cultivation of different fruits as well such as watermelon, muskmelon, banana etc. and they have shown interest for further expansion.
- Most of the women involved in the program have aim to become financially independent, expand their business with the profit and involve all other members from their respective SHGs so that production is possible on a large scale.

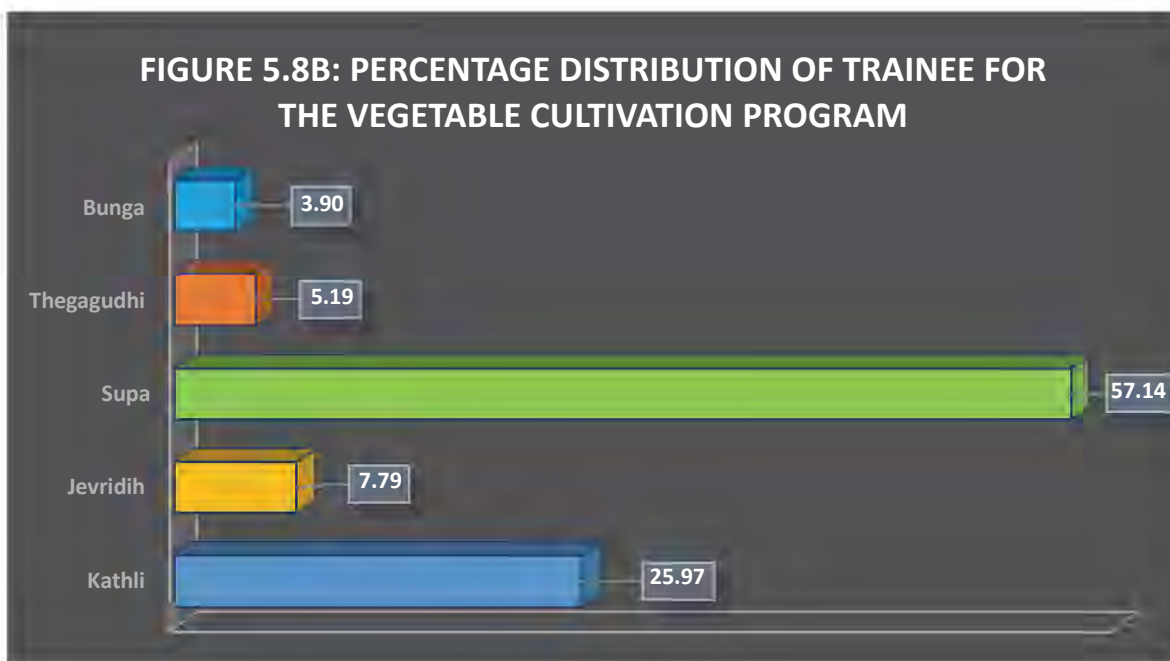
**FIGURE 5.8A: TRAINED SHGs INVOLVED IN VEGETABLE CULTIVATION AT SELECT CSR VILLAGES**



Details of SHG members involved in the training is presented in Table 5.11. The analysis reveals that the training was conducted from 15<sup>th</sup> to 22<sup>nd</sup> February 2021 in Kathli and Supa. Village wise distribution of trainee is demonstrated in Figure 5.8B. The study indicates that majority of the trained members are from Supa which accounts for more than half of the trainee (57.14%) who have participated in the training program.

**TABLE 5.11: STATUS OF SHG MEMBERS FOR VEGETABLE CULTIVATION TRAINING**

Sr. No.	Village Name	No. of SHG participated	No. of members trained
1	Kathli	4	20
2	Jevridih	2	6
3	Supa	15	44
4	Bunga	1	3
5	Thegagudhi	1	4
	<b>Total</b>	<b>23</b>	<b>77</b>



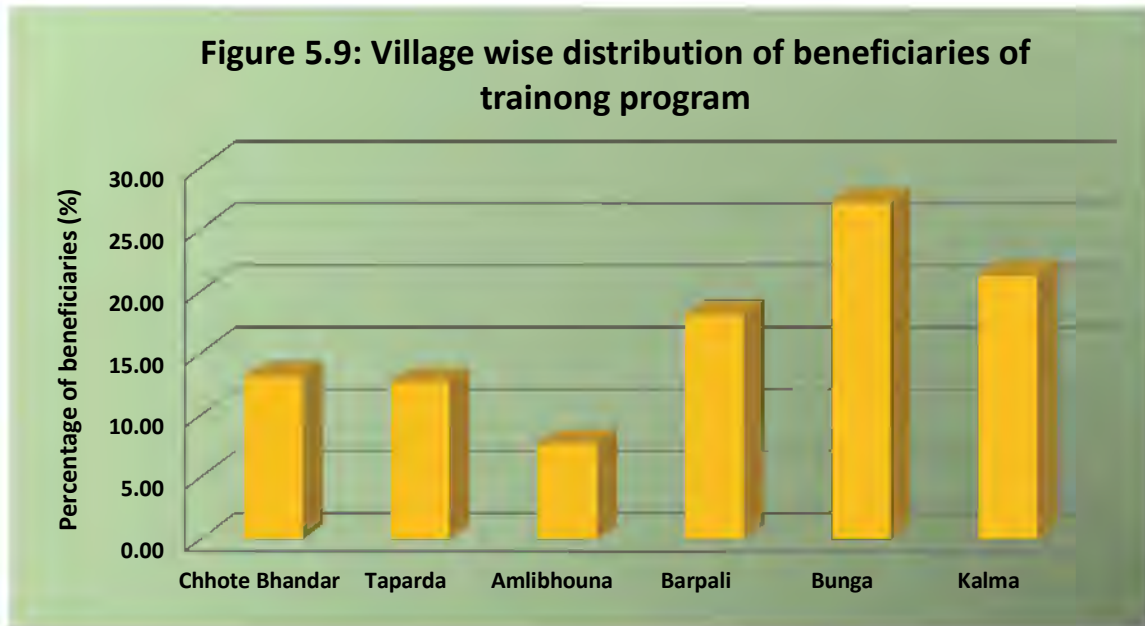
## Livestock Development

After agriculture, livestock is to be taken as one of the major source of income in the villages. The livestock population in the surrounding villages is significant but the productivity is low, rearing practices are poor, breed are non-descriptive. To enhance the income of the farmers by livestock in the peripheral villages various activities are planned like artificial insemination for breed improvement, veterinary services, goat rearing, dairy husbandry, and fodder development.

Livestock management program by AF-REGL under the Pashudhan Vikas Project in association with BAIF is focussed on protection and management of livestock. Details of the program is presented in Table 5.12. The analysis reveals that 6 programs were conducted in 6 different selected CSR villages during the span of November 2021 to January 2023 in which total 221 livestock farmers have been benefited. Village wise distribution of beneficiaries of livestock management training has been depicted in Figure 5.9. The study indicates that majority of the beneficiaries are from Bunga which accounts for 27.15% of the total benefitted livestock farmers.

**TABLE 5.12: MAJOR ACHIEVEMENTS IN LIVESTOCK DEVELOPMENT**

Sr. No.	Village Name	Gram Panchayat	Benefitted Livestock Farmers
1	Chhote Bhandar	Chhote Bhandar	29
2	Taparda	Taparda	28
3	Amlibhouna	Chhote Bhandar	17
4	Barpali	Barpali	40
5	Bunga	Bunga	60
6	Kalma	Kalma	47
<b>Total</b>			<b>221</b>



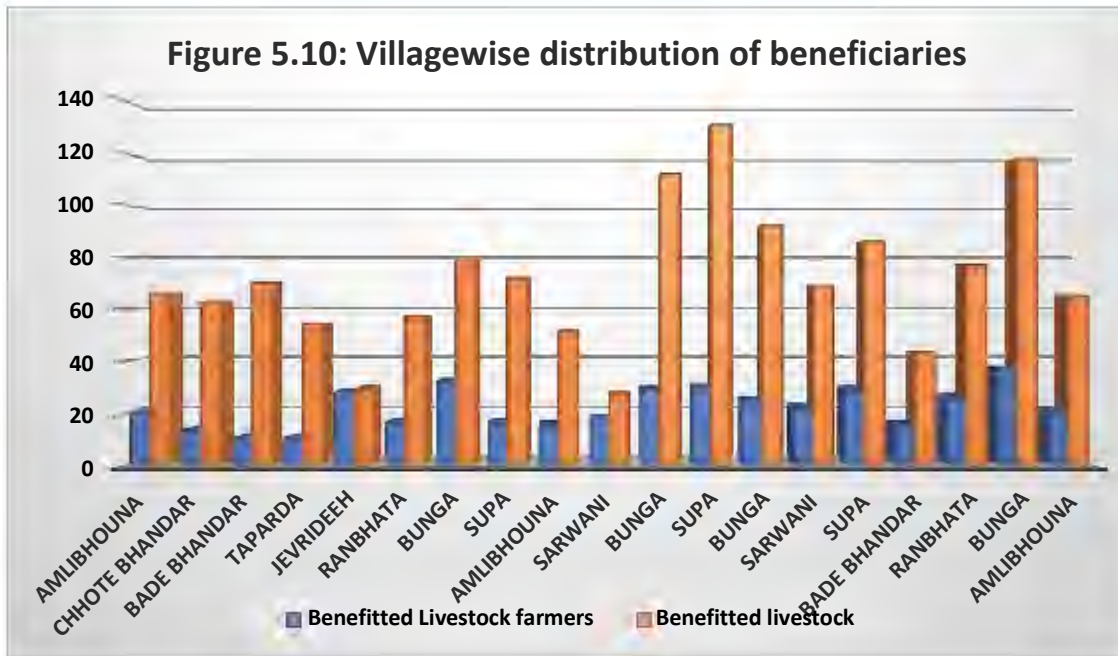
**Veterinary camp:** The Livestock Health and Infertility Camps were organized by AF-REGL under the Pashudhan Vikas Project. Details of the veterinary camps held in the selected CSR villages is presented in Table 5.13. The analysis reveals that Bunga accounts for majority of the benefitted farmers (29.85%) as well as benefitted livestock (29.46%). Village wise comparison of the total number of farmers and livestock benefitted is presented in Figure 5.10. The analysis further reveals that in Jevridih nearly equal percentage of farmers and livestock were benefitted i.e. 49.12 and 50.88 respectively.

**TABLE 5.13: STATUS OF VETERINARY CAMPS HELD IN THE SELECTED CSR VILLAGES**

Sr. No.	Village Name	Gram Panchayat	Benefitted Livestock Farmers	Benefitted Livestock
1	Amlibhouna	Chhote Bhandar	56	182
2	Bade Bhandar	Bade Bhandar	25	113
7	Bunga	Bunga	123	401
2	Chhote Bhandar	Chhote Bhandar	13	63
5	Jevridih	Chhote Bhandar	28	29
6	Ranbhata	Ranbhata	42	134
10	Sarwani	Barpali	40	96
8	Supa	Supa	75	289



Sr. No.	Village Name	Gram Panchayat	Benefitted Livestock Farmers	Benefitted Livestock
4	Taparda	Taparda	10	54
	Total		412	1361



**Home visit under Pashudhan Vikas Project:** AF-REGL organizes home visits to provide different health care services for livestock at doorstep. Details of the status of home visits in selected CSR villages is presented in Table 5.14. The analysis reveals that the service was provided in 4 selected CSR villages. In total, 23 livestock owners along with 79 livestock were benefitted from the program. Village wise distribution of beneficiaries has been depicted in Figure 5.11. The study further indicates that majority of the livestock owners and livestock benefitted from the program are from Bade Bhandar and Jeviridih respectively.

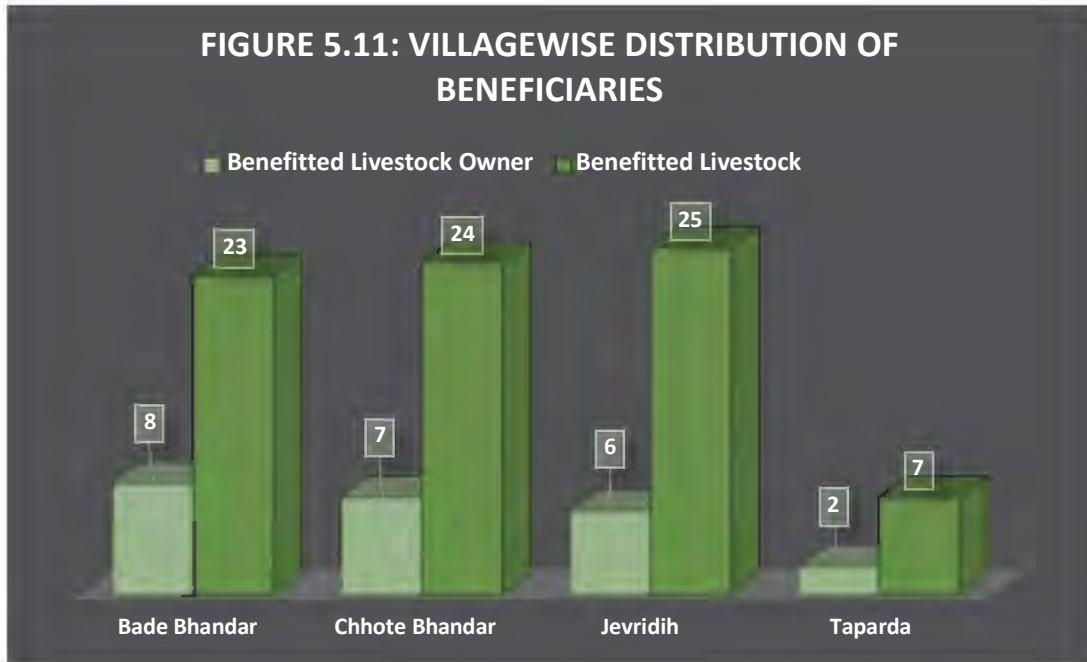
**TABLE 5.14: STATUS OF BENEFICIARIES OF DOORSTEP HEALTH CARE SERVICES FOR LIVESTOCK**

Sr. No.	Village Name	Gram Panchayat	Benefitted Livestock Owner	Benefitted Livestock
1	Bade Bhandar	Bade Bhandar	8	23
2	Chhote Bhandar	Chhote Bhandar	7	24





Sr. No.	Village Name	Gram Panchayat	Benefitted Livestock Owner	Benefitted Livestock
3	Jevridih	Chhote Bhandar	6	25
4	Taparda	Taparda	2	7
<b>Total</b>			<b>23</b>	<b>79</b>



### 5.5.3 Community Health, Hygiene & Sanitation Facilities

The detail of CSR activities on strengthening of community health, hygiene & sanitation facilities undertaken during audit period (i.e 2020-21 to 2022-23) is presented in subsequent sections. Various health awareness activities are conducted by REGL-AF to aware community about sanitation and health-hygiene. The prime activities include: Mobile Health Care Unit (MHCU) to provide basic healthcare services in villages; Health check up camp to provide basic Health check-up facility in schools; Annual Blood donation camp; Health Awareness activity to aware community about sanitation and health – hygiene.

The mobile healthcare unit (MHCU) is currently operational in 15 selected CSR villages (Figure 5.12A). The unit is active from Monday to Saturday in two sessions. The morning session is conducted between 9:30am to 12:30pm and the afternoon session is between 1:30pm to 4:30pm in two different villages. The unit covers three villages on Wednesday. The MHCU comprises of:

- 1 doctor- Dr. Pankaj Singh (MBBS)
- 1 pharmacist- Mr. Harinarayan Singh (D.Pharma)



- Social protection officer (SPO)- Mr. Arun Kumar Yadav
- Driver- Mr. Jageshwar Yadav

**Services provided by MHCU:**

- The MHCU provides initial treatment through checkups and distribution of medicines. The average number of patients in OPD varies from 50-60 per day. In case of serious cases, patients are referred to PHC in Bade Bhandar or CHC in Pusaur block.
- MHCU provides medicines for several diseases such as fever, stomach ache, cough & cold, body ache, high BP, diabetes etc.
- The unit has provision for RBS and Hb tests.
- In case of bed ridden patients, an initial enquiry is first done for verification after which healthcare services is provided in such special cases.
- The DMEAL app has been launched in testing mode since June, 2022 which is associated with data entry of patients visiting OPD per day along with related information. The driver has been given the responsibility to do the initial registration.

**Benefits:**

The MHCU has benefitted the villagers in several ways:

Bharath Mati, a resident of Sarwani village has been availing benefits of MHCU since two years. She was suffering from extreme muscle pain but after undergoing continuous treatment at MHCU, her health has improved considerably.

A villager from Sarwani earlier had to travel to Supa that is located approximately 5 Km away from his village to buy medicines. The cost of medicines amounted to 1000-1200/- but after the mobilization of MHCU his problem has been resolved since the medicines have been made available in his village free of cost.

**Recommendations:**

The following measures are suggested for further increasing the efficiency of services provided by the MHCU:

- A lab technician can be recruited to perform various tests and prepare reports
- Recruitment of a nurse to provide assistance to the doctor. At present the doctor has to do everything on his own which includes measuring blood pressure, temperature etc.
- Building a platform so that the patients can get in the van easily for check ups since the aged and physically challenged patients often find it difficult to go inside the MHCU.
- Awareness regarding MHCU needs to be spread across the villages since many are unaware of the timing or location of the MHCU to avail benefits.

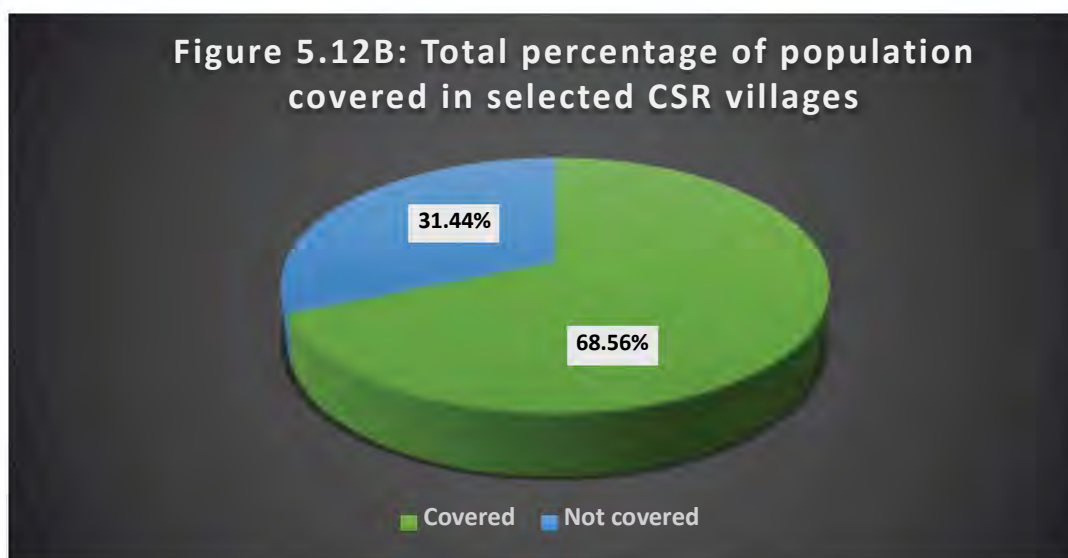
**FIGURE 5.12(A): MHCU PROVIDING SERVICE AT SELECT CSR VILLAGES OF REGL**

**Enrolment in health programme:** The village wise status of new enrolled patients for the period January 2021 to January 2023 has been presented in Table 5.15. The analysis reveals that the health camps have been organized in all the 15 selected CSR villages with total 10283 enrolments during the period of two years. The total percentage of population covered in the health program has been depicted in Figure 5.12(B). The study indicates that 68.56% of total population from the selected CSR villages has been covered under the program. The analysis further reveals that there

is 100% coverage in Jevridih, Barpali, Kathli, Tupakdar and Taparda while there is minimum coverage in Bunga (48.57%).

**TABLE 5.15: STATUS OF NEW ENROLLED PATIENTS IN SELECTED CSR VILLAGES (JAN'21-JAN'23)**

Sr. No.	Name of Villages	Gram Panchayat	Village Population	Total New Enrolled from Jan 21 to Jan 23
1	Bade Bhandar	Bade Bhandar	1198	861
2	Chhote Bhandar	Chhote Bhandar	565	511
3	Amlibhouna	Chhote Bhandar	577	544
4	Jevridih	Chhote Bhandar	425	425
5	Sarwani	Barpali	460	453
6	Barpali	Barpali	802	802
7	Kathli	Taparda	609	654
8	Tupkadhar	Taparda	203	203
9	Bunga	Bunga	2660	1292
10	Ranbhatha	Ranbhatha	1221	895
11	Taparda	Taparda	1009	1009
12	Supa	Supa	1785	805
13	Kotmara	Kotmara	1133	633
14	Kalma	Kalma	1180	590
15	Chandli	Chandli	1171	606
<b>Total</b>			<b>14998</b>	<b>10283</b>



**Health awareness camps:** The health awareness camps were organized by AF-REGL in the selected CSR villages to spread awareness regarding the different health concerns. The village wise status of health awareness camps conducted during the period April 2021 to January 2023 is presented in Table 5.16. The analysis reveals that in total 3515 persons participated in 138



health awareness sessions that were conducted across 15 selected CSR villages. The study further reveals that although majority of the sessions were conducted in Amlibhouna (13), most of the people from Bunga participated in the program (407 participants in 11 sessions). The year wise distribution of participants in health awareness camps is depicted in Figure 5.13. The analysis reveals that more than 62% persons participated in the awareness camp in the year 2022-23.

**TABLE 5.16: VILLAGE WISE STATUS OF HEALTH AWARENESS CAMPS**

Health Awareness Session from Apr 21 to Jan 23								
Sr. No.	Gram Panchayat	Village Name	Session from Apr 21 to March 22		Session from Apr 22 to March 23		Total Awareness Session	Total Participated Person
			Total Session	Participated Person	Total Session	Participated Person		
1	Bade Bhandar	Bade Bhandar	4	103	6	147	10	250
2	Chhote Bhandar	Chhote Bhandar	5	178	6	183	11	361
3	Chhote Bhandar	Amlibhouna	4	70	9	175	13	245
4	Chhote Bhandar	Jevridih	4	62	8	158	12	220
5	Barpali	Sarwani	4	116	8	193	12	309
6	Barpali	Barpali	4	125	4	96	8	221
7	Taparda	Kathli	2	66	4	105	6	171
8	Taparda	Tupakdhar	1	19	5	72	6	91
9	Bunga	Bunga	3	130	8	277	11	407
10	Ranbhatha	Ranbhatha	3	115	8	200	11	315
11	Taparda	Taparda	4	122	6	155	10	277
12	Supa	Supa	3	73	2	53	5	126
13	Kotmara	Kotmara	1	46	6	108	7	154
14	Kalma	Kalma	2	81	7	168	9	249
15	Chandli	Chandli	2	23	5	96	7	119
		<b>Total</b>	<b>46</b>	<b>1329</b>	<b>92</b>	<b>2186</b>	<b>138</b>	<b>3515</b>



#### 5.5.4 Rural Infrastructure Development

The increase in the level of rural infrastructure has two effects: promotion of economic growth and a decline in the incidence of absolute poverty. REGL believes that developing infrastructure is essential for sustaining and multiplying growth of the society. Having the need and immediate expectations of the community, priority was given for infrastructure development in the villages like construction of village road, amenities for safe drinking water, activities for water conservation, construction of community hall etc (Table 5.17). For construction of Jagarnath Temple at village Badebhandar materials support were extended.

**TABLE 5.17: STATUS OF RURAL INFRASTRUCTURE DEVELOPMENT**

Particulars	Number	No. of Villages Covered
Pond Deepening	35	27
Bore well with Pumps for drinking water	63	44
Construction of Water tanks	36	30
Construction of Village CC Roads in KM	30	46
Construction of Community Centers	4	3
School Infrastructure Development	6	3
Other Works (temple, police transit hall)	2	2



**a) Cement Concrete Roads**

REGL under the umbrella of their CSR program took up initiative for better rural connectivity by constructing approximate 30 Km Cement Concrete roads in 46 villages. This initiative is helping in easy movement during rainy season and provides better conveyance and connectivity to community. *"I had never thought that all weathered road shall be constructed in our village in my life time, the dream comes true because of REGL"* says Sarpanch of village Tilgi.

**b) Deepening of Ponds**

Pond is used for multipurpose works in the peripheral villages. Every village have average 2-3 ponds which are used for bathing, irrigation and daily household works. These ponds also maintain ground water levels in the area acting as rain water harvesting structure. Over the period, capacity of these ponds has been reduced by siltation. We get feasibility study on soil and water conservation by AFPRO to address the issues of water conservation. Deepening of 35 ponds was undertaken in total 27 villages.

This enhanced the water storage capacity of the pond and re-charge ground water level thus further help in re-charging nearby dried up hand-pumps. *"Water in pond in summer is boon for the village, now we do not have to go to other village for water"*, say villagers of Semra. As a facility for villagers, stairs in ponds has also been constructed to conduct their daily need. Deepening and beautification of 2 ponds in Raigarh and Sarangarh has also been done as per District Collector's request.

**c) Drinking Water Facility**

Increased access to safe drinking water facility in the villages is one of the priorities for REGL. 63 bore wells along with pump have been installed in 44 villages to facilitate access to drinking water facility. Also 36 water tanks in 30 villages constructed which helps in mitigating wastage of water and ensures availability of potable water to community. On the other hand it also helps in reducing drudgery involves in fetching water from long distance. In some of the villages the panchayat did not maintained the pump and tank. The works for water tanks at all locaton of borewell were not completed.

**d) Community Hall**

With a goal to meet the villager's collective need, construction of community halls, sheds has been taken up (Figure 5.14). One community centre in village Amlibhauna and one community shed in village Sarwani has been completed. The construction work of 3 community centers in village Bade Bhandar and Sarwani has been resumed to complete the same at earliest possible.

CSR department publish in-house quarterly newsletter as part of our communication strategy, the purpose of this newsletter is to keep abreast all employees and stakeholders on our CSR initiatives and strengthen connectivity with the community where we operate.

**FIGURE 5.14: COMMUNITY INFRASTRUCTURE DEVELOPMENT AT SELECT CSR VILLAGES OF REGL**





## 5.6 BUDGET & EXPENDITURE DETAIL FOR CSR ACTIVITIES

There are two types of CSR expenditure, one which is proposed by REGL and approved by District Monitoring Cell and other which is directed by District Monitoring Cell to the REGL. All CSR programme are executed in consultation and direction of District CSR Monitoring Cell chaired by Collector. The core sector wise expenditure incurred for CSR activities at REGL-CSR zone for the last 5 years i.e. from 2015-2016 to 2019-20 is presented in Table 5.18. As mentioned in earlier section that due to major breakdown of the generator plant was not in operation from May, 2017 to December 2019 therefore no significant CSR activities were undertaken during the FY 2018-19 and FY 2019-20 due to adverse financial situation. However a donation of Rs. Five lakhs given for National Tribal Dance Festival, Raipur on request of District Administration during the FY 2019-20.

**TABLE 5.18: SECTOR WISE DETAIL OF EXPENDITURE IN CSR ACTIVITIES OF REGL**

S No	Sector	Expenditure (in lakhs)				
		2015-16	2016-17	2017-18	2018-19	2019-20
1	Rural Infrastructure Development	11.5	14.14	23.62	-	-
2	Sustainable Livelihood Development	21.07	0.55	4.12	-	5.0
3	Education Programme	34.93	16.45	0.25	-	-
4	Community Health & Sanitation	2.24	1.42	1.15	-	-
<b>Total</b>		<b>69.74</b>	<b>32.56</b>	<b>29.14</b>	<b>-</b>	<b>5.0</b>

The sector wise budget for the year 2021-22 and 2022-23 is presented in Table 5.18. The analysis reveals that REGL-AF 102.01 and 161.31 lakhs respectively. The activity wise budget for undertaking CSR activities are presented in Table 5.20 to 5.25. The analysis reveals that the maximum fund is being expended in sustainable livelihood development followed by community health and education. The budget allocated during 2021-22 for strengthening community health accounts for about 31.61% of total CSR fund followed by education facilities i.e. 21.92% and sustainable livelihood development & community infrastructure which accounted for 18.30% and 18.13% respectively of total CSR fund. Whereas the budget allocated during 2022-23 for strengthening community health accounts for about 30.00% of total CSR fund followed by sustainable livelihood development i.e. 28.55% and education facilities & community infrastructure which accounted for 15.67% and 15.57% respectively of total CSR fund.

**TABLE 5.19: SECTOR WISE DETAIL OF BUDGET & EXPENDITURE IN CSR ACTIVITIES OF REGL**

Sr No	Activities	F.Y.2021-22 (Amount in Lakh)			F.Y.2022-23 (Amount in Lakh)		
		Capex	Opex	Total	Capex	Opex	Total
1	General Management and Administration	0.50	7.73	8.23	0.60	15.85	16.45
2	Education	0.00	22.36	22.36	0.00	25.28	25.28
3	Community Health	0.00	32.25	32.25	0.00	48.40	48.40
4	Sustainable Livelihood Development	0.00	18.67	18.67	0.00	46.06	46.06
5	Community Infrastructure Development	0.00	18.50	18.50	0.00	25.12	25.12
6	Promotion of Rural Sports & stakeholder Mgt	0.00	2.00	2.00	0.00	0.00	0.00
	<b>Total</b>	<b>0.50</b>	<b>101.51</b>	<b>102.01</b>	<b>0.60</b>	<b>160.71</b>	<b>161.31</b>

**TABLE 5.20: ACTIVITIES WISE DETAIL OF BUDGET & EXPENDITURE IN CSR ACTIVITIES OF REGL  
– EDUCATION SECTOR**

Sr No	Activities	F.Y.2021-22 (Amount in Lakh)			F.Y.2022-23 (Amount in Lakh)		
		Capex	Opex	Total	Capex	Opex	Total
1	Provide Drinking water facility- RO cum Cooler (50 LPH) in two higher secondary schools with all fittings	0.00	1.00	1.00	0.00	0.00	0.00
2	Digital Classroom Project, E-learning (Gyanodaya Project) in 8 middle schools and 4 high schools	0.00	15.60	15.60	0.00	13.15	13.15
3	Coaching classes for clerical grade job exams - banks, police, railways, revenue dept etc	0.00	5.76	5.76	0.00	7.45	7.45
4	Sports for Development-Train youths for kabaddi	0.00	0.00	0.00	0.00	4.68	4.68
	<b>TOTAL</b>	<b>0.00</b>	<b>22.36</b>	<b>22.36</b>	<b>0.00</b>	<b>25.28</b>	<b>25.28</b>

**TABLE 5.21: ACTIVITIES WISE DETAIL OF BUDGET & EXPENDITURE IN CSR ACTIVITIES OF REGL  
– COMMUNITY HEALTH**

Sr No	Activities	F.Y.2021-22 (Amount in Lakh)			F.Y.2022-23 (Amount in Lakh)		
		Capex	Opex	Total	Capex	Opex	Total
1	Mobile Health Care Unit (MHCU) - CF 21-22 Amt. 10.05 Lakhs	0.00	30.50	30.50	0.00	46.80	46.80
2	Speciality Health camps (4 camps in year)	0.00	1.00	1.00	0.00	0.00	0.00
3	Observance of Health days /week (National Nutrition Week-1st to 7th Sep, Global Hand Washing Day-15th Oct, World Toilet Day-19th Nov)	0.00	0.75	0.75	0.00	0.00	0.00
4	Medical First Aid Camp	0.00	0.00	0.00	0.00	1.60	1.60
	<b>TOTAL</b>	<b>0.00</b>	<b>32.25</b>	<b>32.25</b>	<b>0.00</b>	<b>48.40</b>	<b>48.40</b>

**TABLE 5.22: ACTIVITIES WISE DETAIL OF BUDGET & EXPENDITURE IN CSR ACTIVITIES OF REGL  
– SUSTAINABLE LIVELIHOOD DEVELOPMENT**

Sr No	Activities	F.Y.2021-22 (Amount in Lakh)			F.Y.2022-23 (Amount in Lakh)		
		Capex	Opex	Total	Capex	Opex	Total
1	Tailoring cum Production center through ASDC	0.00	6.00	6.00	0.00	9.48	9.48
2	Skill Training to SHG members for Income Generating Activities	0.00	4.60	4.60	0.00	8.37	8.37
3	Orchard based cropping project	0.00	0.00	0.00	0.00	3.48	3.48
4	Livestock Development Activities	0.00	5.55	5.55	0.00	15.55	15.55
5	DDIM	0.00	2.52	2.52	0.00	9.18	9.18
	<b>TOTAL</b>	<b>0.00</b>	<b>18.67</b>	<b>18.67</b>	<b>0.00</b>	<b>46.06</b>	<b>46.06</b>

**TABLE 5.23: ACTIVITIES WISE DETAIL OF BUDGET & EXPENDITURE IN CSR ACTIVITIES OF REGL  
– COMMUNITY INFRASTRUCTURE DEVELOPMENT**

Sr No	Activities	F.Y.2021-22 (Amount in Lakh)			F.Y.2022-23 (Amount in Lakh)		
		Capex	Opex	Total	Capex	Opex	Total
1	Balance work of Community Center (3nos)	0.00	8.50	8.50	0.00	17.62	17.62
2	CID work at village Kalma (Raw water pump house) on recommendation of site	0.00	10.00	10.00	0.00	7.50	7.50
	<b>TOTAL</b>	<b>0.00</b>	<b>18.50</b>	<b>18.50</b>	<b>0.00</b>	<b>25.12</b>	<b>25.12</b>

**TABLE 5.24: ACTIVITIES WISE DETAIL OF BUDGET & EXPENDITURE IN CSR ACTIVITIES OF REGL  
– PROMOTION OF RURAL SPORTS & RESPONSE TO EMERGENCIES & RELIEF**

Sr No	Activities	F.Y.2021-22 (Amount in Lakh)			F.Y.2022-23 (Amount in Lakh)		
		Capex	Opex	Total	Capex	Opex	Total
1	Promotion of Rural sports through providing support to local Youth Clubs, coaching and training, organization of Kabbadi/Volley ball tournament.	0.00	1.00	1.00	0.00	0.00	0.00
2	Response to Emergencies & Relief	0.00	1.00	1.00	0.00	0.00	0.00
	<b>TOTAL</b>	<b>0.00</b>	<b>2.00</b>	<b>2.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

**TABLE 5.25: ACTIVITIES WISE DETAIL OF BUDGET & EXPENDITURE IN CSR ACTIVITIES OF REGL  
– GENERAL MANAGEMENT & ADMINISTRATION**

Sr No	Activities	F.Y.2021-22 (Amount in Lakh)			F.Y.2022-23 (Amount in Lakh)		
		Capex	Opex	Total	Capex	Opex	Total
1	DDIM	0.00	5.63	5.63	0.00	6.89	6.89
2	Travelling & Local Conveyance	0.00	1.00	1.00	0.00	0.50	0.50
3	Training, Workshops and Seminars	0.00	0.50	0.50	0.00	0.50	0.50



Sr No	Activities	F.Y.2021-22 (Amount in Lakh)			F.Y.2022-23 (Amount in Lakh)		
		Capex	Opex	Total	Capex	Opex	Total
4	IT Related Expenses-Laptop	0.50	0.00	0.50	0.60	0.00	0.60
5	Telephone & Mobile Exp	0.00	0.24	0.24	0.00	0.06	0.06
6	Office Stationaries/Newspaper etc	0.00	0.36	0.36	0.00	0.10	0.10
7	Vehicle Hire Charges	0.00	0.00	0.00	0.00	7.80	7.80
	<b>Total</b>	<b>0.50</b>	<b>7.73</b>	<b>8.23</b>	<b>0.60</b>	<b>15.85</b>	<b>16.45</b>



## 6.0 SOCIAL AUDIT OF CSR ACTIVITIES

APL has always endeavored to be a leader in community development (CD) and corporate performance, which can be measured in terms of economic, social, and environmental impacts. Further, specifically on CD, APL is governed by the CSR policy formulated in August, 2014 (Annexure 2.1). APL CSR policy is primarily governed by Section 135 of the Companies Act, 2013, which was passed by both Houses of the Parliament, and had received the assent of the President of India on 29 August 2013 on CSR and also conforms to the guidelines of CSR for central public sector enterprises, issued by the Department of Public Enterprises, Ministry of Heavy Industries, and Public Enterprises, Government of India.

### 6.1 IDENTIFICATION OF CSR PROJECTS

As per the APL's CSR policy, August 2014, the first step of planning is identification of broad activities. The broad activities closely linked with the long-term social development goal and objectives and adhere to the practice of sustainable development. An indicative list of prime areas of intervention is placed at Table 6.1. The list is only indicative and not exhaustive. However, the key focus of CSR projects was on facilitating infrastructure provision for qualitative improvement in health, education, access to water/sanitation, and improved roads.

**TABLE 6.1: INDICATIVE LIST OF MAJOR AREAS OF INTERVENTIONS FOR COMMUNITY DEVELOPMENT**

Sl. No.	Area of Intervention for CSR Activities
1	Drinking water facility
2	Education
3	Improving the quality of life of girl child
4	Improving lives of vulnerable persons such as physically challenged, destitute women, widow
5	Improving lives of scheduled caste and scheduled tribe people
6	Electricity
7	Solar lighting system
8	Health and family welfare
9	Irrigation facilities
10	Sanitation and public health
11	Grazing land development
12	Promotion of sports and games



Sl. No.	Area of Intervention for CSR Activities
13	Promotion of art and culture
14	Promotion of livelihood for economically weaker sections through forward and backward linkages
15	Relief of victims of natural calamities like earthquake, cyclone, drought, flood situation in any country
16	Supplementing development programs of the government
17	Construction of community centers/ night shelters/ old age homes
18	Imparting vocational training
19	Setting up of skill development centers
20	Adoption of villages
21	Scholarships to meritorious students belonging to SC, ST, OBC and disabled categories
22	Adoption or construction of hostels (especially those for SC/ST and girls)
23	Skill training, entrepreneurship development and placement assistance programs for youth
24	Building roadways, pathways, and bridges
25	Entrepreneurship development programmes
26	Activities related to improvement of livestock
27	Capacity building of the project affected persons to improve their employability

## 6.2 IDENTIFICATION OF CSR PROJECT AREA

The geographical area for implementation of the CSR project extends to entire CSR zone of REGL TPP. Under the REGL's CSR zone, there are altogether 126 CSR villages, which have been identified on the basis of their proximity with the TPP along with the magnitude of impact. The detail of CSR zone of TPP has been already presented in earlier chapter.

## 6.3 ACTION PLANS FOR CSR ACTIVITIES

Action plan involves empowering project affected persons (PAPs), community and the target villages in a phased manner and for an identified planned period. This involves the basic and immediate needs of the PAPs, community and target villages, such as roads, school, health, sanitation and drinking water-related plans, and projects.

A three phased CSR action plan (CSR-AP) plan has been prepared:

**Long-term Plan:** Long-term perspective social development plan for 20 years, which is in accordance with the long-term corporate plan of Adani Foundation. The plan includes the overall social development in the vicinity of REGL's TPP.

**Medium-term Plan:** Medium-term project plan for five years, which is in coherence with the REGL business plan. The plan considers different sector specific projects such as education, health, infrastructure development and sustainable livelihood in the vicinity of REGL's TPP.

**Short-term Plan:** Short-term action plan for one year which is in accordance with REGL's annual target plan. The plan includes the activities to be undertaken in a particular year under the medium term plans.

The phase wise action plan for undertaking CSR activities in REGL's CSR zone is presented in subsequent section:

### 6.3.1 Identification of Area for CSR Activities

The need-based community development work is being undertaken in the CSR villages as an integral part of the REGL's TPP under CSR activities. These facilities may also be available to the host population and the neighbouring community and facilitate socio-economic development of the area. The facilities/ amenities may include following:

- Strengthening of educational facilities
- Strengthening of medical facilities
- Strengthening of sanitation facilities
- Strengthening of drinking water facilities
- Strengthening of veterinary facilities
- Setting up of skill development center/ Adoption of ITI
- Strengthening of irrigation facilities
- Women & child empowerment
- Community hall/panchayat ghar
- Strengthening of cultural and sports facilities
- Tree plantation, etc.
- Internal and link/approach road with proper drainage
- Infrastructural strengthening for rural electrification

The land for developing above facilities is being provided by the State Government. The infrastructural facilities shall be set up by REGL on the basis of assurance from the State Government that it will take over the infrastructural facilities and maintain it properly.



Special emphasis for community developmental work is being given to the villages/hamlets, which are falling close to the TPP as well as railway corridor and water intake. The need assessment survey for community development in the CSR villages had indicated for undertaking the following programmes at GP level:

- Strengthening of educational facilities
- Strengthening of Medical & Sanitation facilities
- Strengthening of Inter-village roads within the GP
- Sustainable Livelihood Development
- Water conservation and management for domestic and agricultural needs
- Afforestation on roadside and other government vacant lands under the possession of local Panchayat and Block authority

The above mentioned programme are being undertaken in association with State Government and concerned District authority.

Development programmes for the selected CSR villages include:

- Intra-village concrete roads
- Development of village drinking water facilities
- Development of rain-water harvesting system
- Strengthening of infrastructural facilities in primary schools
- Formation and development of Self-Help Groups / Mahila Samitis
- Skill Development Programmes with special emphasis on vulnerable groups
- Social and farm forestry for fuel, fodder and other domestic needs
- Strengthening of cultural and sports facilities

REGL has been continuously working towards the improvement of the quality of life of the people in the communities surrounding their plants. The following measures are being undertaken for minimizing the adverse impacts on socio-economy and parameters of human interest:

- Communication with the local community had been institutionalized and done on regular basis by the AF-REGL authorities to provide an opportunity for mutual discussion to undertake CSR activities.
- AF-REGL authorities organize regular awareness programmes to bring forth beneficial aspects of the project and social welfare measures, being undertaken for improving their Quality of Life.
- For social welfare activities being undertaken by the AF-REGL authorities, collaboration has been sought with local administration, Gram Panchayat, Block Development/Tehsil Offices etc. for better co-ordination, records and also to approach the public.
- Providing skill development training to the women folk as part of welfare activities greatly enhanced and improved their economic strength. Self-help groups for women are being encouraged in nearby CSR villages and proper skill upgradation training are being imparted besides encouraging local entrepreneurship around the project activities.
- Job oriented skill training courses have been organized through Adani Skill Development Center (ASDC) as well as Industrial Training Institutions (ITI) for Educated Youth (both for male and female), like Welding, Electrical, Nursing, computer, tailoring, mushroom cultivation, agarbatti making, lac bangle making and other project related specific trades.
- Regular awareness and sensitization programmes are being organized involving women participation in conservation efforts and creating awareness about environmental pollution and health, encouraging respect for local traditions and religious beliefs and promoting local folk dance and music.
- Awareness programmes are being organized to help and educate the local people about the Disaster Management as well as Environmental and Social Management in the project area in association with local administration.
- Some of the community development schemes include tree plantation on avenue roads and other open spaces, providing free health check-up facility and medicines to the poor villagers, providing assistance to construct school building, providing scholarships to deserving and needy students, giving educational aids to poor students, constructing community centers at selected CSR villages, strengthening drinking water facilities like tube-wells & installation of RO Plant in some villages, sponsoring sports tournaments and summer coaching camps, etc.

It has been observed that the constraints of accessing civic amenities are primarily associated with the inappropriate governance and institutional arrangements in managing and monitoring of the services and lack of community involvement in operation and management of services

which is resulting unsustainable financing and poor implementation of various developmental schemes of Central as well as State Government.

There is a need for strengthening an execution process for civic amenities and to establish a strong local governance institution supported by an appropriate monitoring framework and taking into account the following issues:

- Strengthening of intra village road along with drainage facilities.
- Adequate drinking water facilities in most of the CSR villages.
- A clear focus of measurable improvements in health services.
- Individual sanitation with proper solid waste and wastewater disposal system.
- Providing teaching aids viz., bench, desk, computer, etc. and developing the sports facilities in primary/secondary schools.
- Providing additional support to Angandwadi Centres with nutritional food and recreational aspects in mind.
- Providing street lighting facility, preferably solar powered to ensure regularity of light at night.
- Involvement of all the major stakeholders in community development programme i.e. identification, implementation as well as subsequent operation and maintenance of the same.

The most pressing health needs identified by the representatives of the community include:

- Organize preventive healthcare campaign in the CSR villages.
- Organize regular health camps and/or run a mobile clinic.
- Make community access to reproductive health information and services.
- Increase access to better quality drugs, especially anti-malarial drugs and for water borne diseases.
- Promote sanitation practices which includes construction of closed drainage systems.

The key needs for intervention in education include:

- School stakeholders including teachers, parents, panchayat representatives, etc. needed to be consulted thoroughly and identify their role and functions for delivery of quality education.
- Expansion of school services, e-learning tools/kits, learning ambience, infrastructural facilities, sports facilities, improve Mid-Day-Meal (MDM).
- Some schools require additional infrastructure facilities (classrooms, boundary wall, drinking water treatment and supply system, latrines, teacher's room, Computer facilities, development of playground, MDM cooking shed or storage, seating arrangements etc).
- Improve teaching skills and access to teaching-learning materials through e-learning solutions.
- Adequate sanitation facilities, including facilities for girls.
- Provision of learning aids like science model, exposure, basic laboratory teaching materials, library and textbooks.
- Support transport facilities for children especially girls for secondary and higher education.

The major reasons of failure of agriculture and allied sector in the area in providing enough employability includes natural drawbacks viz. poor quality of soil, irregular rainfall and ineffective irrigation facilities; the reasons at the human interface includes drawbacks like use of traditional methods of farming, lack of proper backward and forward linkages, inadequate skills and paucity of funds for investment.

Underdevelopment of market, lack of technical skills and limited opportunities of employment in the industrial activities are the reasons of unemployment in the nonfarm activities. Among the educated youth, lack of technical education, training and disinterest for self-employment and lack of resources for the same are the visible reasons of significant numbers of unemployed youths in the area.

Key needs of intervention in the livelihood and employment sector include:

- Creation of irrigation infrastructure
- Introduction of improved agriculture practices viz; inter cropping, SRI paddy, usage of sprinklers, horticulture crops, etc through demonstrations and trainings.

- Promotion of dairy and poultry as a secondary occupation.
- Technical and business development trainings for youth.
- Computer and English trainings for graduates.
- Seed capital support for setting up enterprises.
- Job counselling and career development programme for better employability.

As an essential pre-requisite for skill development and self-employment of the local people, two kinds of needs could be visualized. These are:

- Orientation and development of skills in traditional occupation
- Skill development in new type of occupation

Skill development training is essential so that the technical and financial aspects of any trade or business can be clearly understood and resources are utilized optimally. Different types of skill development and orientation programme may be required for the men and women or their family member separately. The required new skills may be developed in line with DDU-KVY in collaboration with the Director General of Employment and Training, Ministry of Labour & Employment, Government of India.

The traditional skills may be developed with the help of local vocational training institutes/NGOs, etc. These programs may be organized at the school premises or community hall at village level.

### **6.3.2 CSR Action Plan**

Medium-term CSR action plan (CSRAP) for five years envisages improvements of the standard of living of more than 70% of the people in the CSR villages of REGL's TPP. For the purpose, REGL plans to undertake CSR activities in the phase manner initially covering the CSR villages which are closer to the main plant, ash dyke, railway/road co-corridor, water intake and subsequently, extending the same to the other CSR villages.

The focus is being provided to increase access to basic services like drinking water, sanitation, education and health for all households. Livelihood opportunities both in agriculture and non-farm are being promoted ensuring increase in real incomes by at least 50% by the end of five years. A multi-pronged approach to the same is being followed:

- Improving quality of education
- Strengthening services for Community Health
- Promotion of Sustainable Livelihood Activities
- Rural Infrastructure Development

The strategy is to work with local gram panchayat for planning and development of infrastructure, while user groups may be created operation and maintenance of these structures. REGL provides around 60% of the capital cost of the structures, while the respective Panchayat is being supported to raise the other 40% from its own funds, through various government schemes and community contribution. It is also proposed that a user fee based maintenance mechanism is being developed for all infrastructure created.

Focus is being laid on covering at least 30% of SC/ST households in all the programmes implemented. Women and Children are being specifically targeted for health programmes. A special focus may be given on providing training and business development/ job counselling support to all ITIs, Diploma holding youths in the CSR villages. For building the capacities of the communities on local governance; SHGs of women; Youth Clubs and Farmers Societies may be promoted and strengthened.

### 1. Improving Quality of Education

**a. Infrastructure Support & Upgrading Local Education Institutes:** There is need for improvement in school infrastructure and upgrade the services of educational institution in the first two years. This includes activities like repairing or adding on the existing infrastructure:

- Additional room construction in primary schools. Development of library in each school which has classes between 5th to 7th standard.
- Construction of multipurpose Activity hall
- Computer Centre
- Bench, desk, blackboard, etc.
- Separate Toilets for Girls & Boys

**b. Increase Access to Provisions of Learning Aids viz.**

- School Bags may be provided to poorer students

- Teaching Learning Material (including e-learning), Books may be provided to schools
- Supports like bicycle, books, school fee etc may be provided to Girls for promotion of girl child education

**c. Youth Development Programmes viz.**

- Extra classes after School Time may be organized for weaker students
- Sports promotion activities may be organized in local schools and colleges
- Cognitive development activities viz. essay writing, quiz, debates etc may be held through intra and inter school competitions
- Health check-up camp may be held every year
- Career/Job Counselling camps may be held every year.

**d. English & Computer Training Centers and Adoption of ITI:**

The employability of the local educated youth viz. undergraduates and graduate to be increased by providing effective skill building in applied knowledge of English language, computer application. The courses and learning facilities need to be upgraded with Private-Public Partnership approach to go with the market demand in technical workforce.

- Computer and English training courses are being organised for graduate/undergraduate youth.
- Skill upgradation training and business development courses for ITI/Diploma passed youth may be conducted. They are being supported to access bank loan/Govt schemes for setting up their own enterprise and/or also provided with job counselling services.

**2. Strengthening Services for Community Health**

- Health Camps, Gynec Camps may be undertaken every six months.
- Strengthening of mobile health clinic service and free check-up camp and medicines may be provided.

- Special Health Camps & Multi Specialty Camps may be organized for general diseases and with a focus of women and child health
- Contribution towards up-gradation & support to Primary Health Centre & CHCs
- Aids are being provided to poor patients for referral to district and state hospitals
- Material support for construction of individual toilets.
- Water and sanitation facilities are being provided viz. drainage, potable water & distribution facilities in surrounding CSR villages

### **3. Promotion of Sustainable Livelihood Activities**

#### **a. Skill Development Activities**

- Skill development training for income generation through ASDC and using other local resources is being organized regularly.
- A small credit fund may be developed with an initial capital to provide seed money for each SHG of women.
- Farmers society, Youth Club which can demonstrate credibility (and preferably has taken and repaid bank loan at least once) may be entitled to take loan up to Rs. 25,000/- from this fund at a minimal interest rate of 9% per annum.

#### **b. Promote Improved Agriculture and Cattle Care Practices**

- Agriculture and Horticulture demonstration activities may be taken up. This includes provision of improved seeds, compost development, sprinkler sets for farmers, etc.
- Since Paddy is the only crop undertaken in Kharif season, inter cropping/second crop with pulses may be promoted.
- Kitchen garden with drip may be promoted.
- Development of fodder plots
- Construction of Low Cost Cattle Shed
- Cattle Health Camp & Cattle Care Programmes



- Introduce organic farming & vermi-compost & awareness creation for the same
- Small poultry units of 50 chicks of improved variety may be promoted as IGA.
- Deepening of ponds, providing of diesel pump sets to farmers in groups of 5-7 for using on share and pay basis.
- Introduction of group well concept: This includes deepening of an existing well along with irrigation infrastructure (diesel pump and pipeline) to small-holder farmers' group including 5-7 farmers. This could be particularly useful for also providing support irrigation for fodder/vegetable cultivation in Rabi season or summer months which can then be marketed by the group to get additional income.

#### 4. Rural Infrastructure Development

Under infrastructure development programme, emphasis is being laid on repairing or adding on the existing infrastructure in the CSR villages initially. This includes activities like:

- Construction of common community facilities viz. Community Centre, Bus Shelters, Gardens etc
- Construction of toilets in public institutions, angandwadi, school and panchayat.
- Construction & up-gradation of village approach roads and internal roads under PPP model
- Provision of solar streetlights in CSR villages particularly ensuring coverage of SC/ST hamlets.
- A PPP model may be taken to increase access to housing facilities by construction of low cost houses in collaboration with Government schemes viz. IAY.
- Check dams & pond deepening & other water & soil conservation activities
- As a part of irrigation infrastructure development, it is useful to undertake repair and maintenance of canal works in collaboration with irrigation department and the canal society, since more than 70% of the farmer's land is covered under the canal irrigation schemes.

The year wise plan for community development programmes (infrastructure development in CSR villages) and skill development programmes are being finalised in consultation with Village

Development Advisory Committee (VDAC) consisting of representatives of PAPs, District Administration, other stakeholders and TTPP.

### 6.3.3 Community Engagement Plan

Youth represent a large segment of the population (i.e. approx 27.5% of the population comprise the youth), it that can be mobilised for community service and development programmes. On one hand, by participating in community service schemes, youth can contribute to grassroots development efforts and help create progress in backward regions. At the same time, these initiatives help the youth build their own skills, such as communication, leadership, inter-personal relationships and develop a sense of moral responsibility and national ownership.

Ministry of Youth Affairs & Sports (MoYAS) currently runs several schemes to enable youth to engage with their community, as well as to participate in grassroots development. Some of these schemes are NYKS, NYPAD and the NSS. These schemes target varying youth segments, and have different models of participation. In addition to MoYAS schemes, there are a range of other government schemes like the Bharat Nirman Volunteers (BNV) programme of Ministry of Rural Development. BNVs are dedicated volunteers working in rural areas for generating awareness among the people about their rights and entitlements. Similarly, the positions of community workers created under NRLM provide opportunity to such workers to get intensely involved in the development programmes, besides being avenues of substantial income to them.

There are also several community-based youth organizations in various parts of the state as well as the country that work towards community development. NGOs, non-profit organisations, corporates through their CSR programmes and social entrepreneurs are engaged across the country on issues ranging from clean fuel usage to prevention of trafficking and rehabilitation. Several of these organisations have youth volunteers and youth employees.

There is a need to institutionalise community engagement and to design and streamline schemes such that they cater to the non-homogenous youth population. Accordingly following community engagement plan may be explored:

#### **a) Promotion of Community Development Organisations (CDOs):**

While the government continues to implement the schemes that have seen great success, going forward REL may also leverage the large number of organizations that are already working towards community development in project area. This may multiply the scope of youth community engagement and has significant potential to generate positive outcomes at the grassroots level.

- A framework for inventory of accredited and certified NGOs or CDOs is being developed. This may enable funding agencies and youth volunteers to select the most appropriate organisations based on their needs. It can promote the scaling up of organisations that have clearly defined goals and a successful track record for community development.
- A volunteer exchange platform has been set up in project area. Through this platform, the youth that are willing to participate in community development programmes can be identified. Similarly, organisations working in the field that require young volunteers or employees can post their requirements. This may enable the matching of volunteers with organisations in an efficient manner.
- Institutionalise the involvement of youth in disaster response activities. Local youth, because of their dynamism and proximity, are invariably the first responders in any disaster relief and rescue activity. Such team activity in the face of adversity not only builds camaraderie and leadership but also provides a much needed succour to the affected individuals. There is a need to create structures that tap this latent resource and realize its full potential through proper training, equipping and coordinating their efforts with those of the state disaster relief mechanism. Every State and district of the country has Disaster Management Authority as mandated by Disaster Management Act, 2005. The Civil Defence Act, 1968 has also been amended to bring 'disaster management' within its scope. In addition, the panchayats also have a major role under the Disaster Management Act, 2005. The youth can be closely involved in disaster response activities through these mechanisms.
- Similarly, the latent potential and dynamism of youth is also being harnessed in promoting communal harmony and environmental protection.
- The energies of the youth are also being channelized in constructive areas through Panchayati Raj Institutions, which are increasingly playing greater role in local self-governance. This includes campaigning on various social issues and helping in effective implementation of various Government programmes.

#### **b) Promotion of Social Entrepreneurship:**

There are a growing number of social entrepreneurs who recognise that they can create sustainable grassroots development, while making a return for themselves. The social entrepreneurship space is fragmented and largely unregulated and the REL in association with Government may create an enabling environment for social entrepreneurs.

- Promoting social entrepreneurship as an attractive employment proposition for youth creates a positive shift away from volunteerism and philanthropy to sustainable

development. This can transform community development and engagement from a short-term prospect for the youth into a sustainable career option.

- Social entrepreneurs require support in the form of seed funding and angel investment. The government can create an enabling policy regime that supports the creation of these funds. It can enable identification of credible enterprises and financiers through an endorsement process. It can also reward the performance of social entrepreneurs through grants-in-aid and award programmes. These rewards can create further mobilisation of youth towards social enterprise.
- The Government is well positioned to create channels of communication between social entrepreneurs, local communities, investors and policymakers. Social enterprise forums can be convened that enable the exchange of information around successful models, navigating the complex policy environment, and can generate forward and backward linkages between enterprises. Removing barriers to business on a priority basis for organisations with a social objective can also spawn the development of more social enterprises.

#### 6.4 CONCEPTUALIZATION OF SOCIAL AUDIT

The REGL has initially identified 4 villages in the core zone, 73 villages in buffer zone-I (i.e. within 5 km radius of TPP) and buffer zone-II (i.e. within 5-10 km radius of TPP) i.e. total 77 villages as the CSR villages. In addition to this, some other villages in the vicinity of water intake have been selected besides Raigarh town for undertaking various CSR activities. The social audit of CSR activities have been undertaken for the last five years i.e. 2015-16 to 2019-20.

The comprehensive profile of all CSR activities illustrate the following two types of programmes and target groups:

- i) Activities targeted to individual persons like students, physically challenged persons, women, unemployed youth, etc.; and
- ii) Activities targeted on whole community, namely, infrastructure works, support provided to resource-poor institution (school, colleges, Panchayets, etc.), entertainment, health and sanitation etc.

Thus, the activities were bifurcated into two major parts, namely, individual beneficiary oriented activities and community-beneficiary oriented activities. Further, the individual beneficiary oriented activities and community-beneficiary oriented activities were divided into various sectors. The individual beneficiary oriented activities were sub-divided into five sectors, namely, education, health, vocational training, sports & disability. The community-beneficiary oriented activities were similarly sub-divided into three broad areas, namely infrastructure, provision of additional support to institutions and other such activities. A diagrammatic representation of the conceptual framework is shown in Figure 6.1.

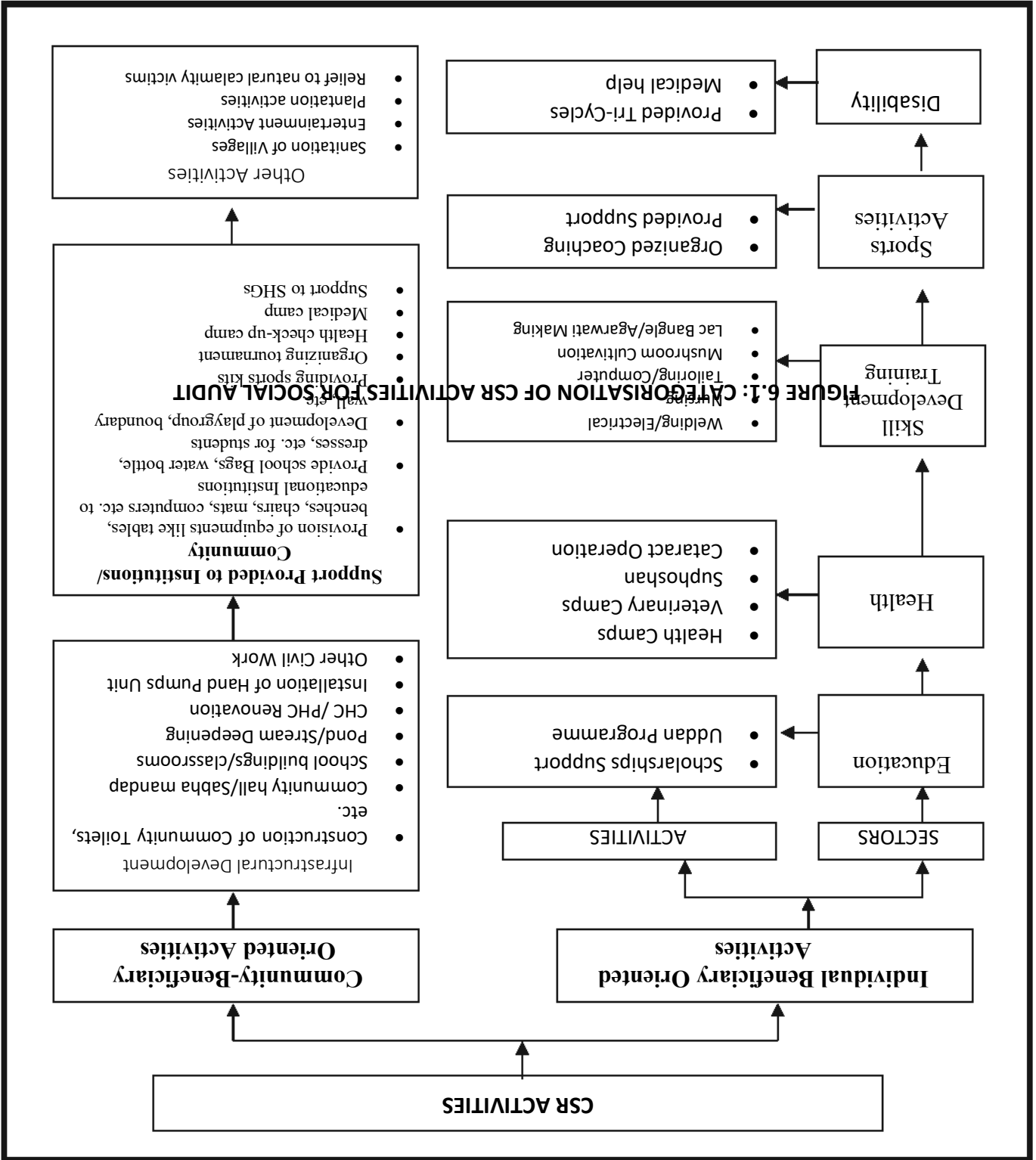


FIGURE 6.1: CATEGORISATION OF CSR ACTIVITIES FOR SOCIAL AUDIT

## 6.5 SOCIAL AUDIT OF COMMUNITY BENEFICIARY ORIENTED CSR ACTIVITIES

### 6.5.1 Reactions of Local Community

This section presents the reaction of local community on the various activities and programmes conducted in their villages based on the records of focused group discussions (FGDs). The FGDs were held in the selected villages where CSR activities were undertaken and the reactions of the groups were documented. Issues like awareness of the local people on the prospective implementation of various community beneficiary oriented CSR activities, information on the selection process and procedures, decision making body on assessment of the needs of the village, involvement of level of the local people in such decision and implementation process, assurance given to local and extent of meeting of expectations of the local people, and other such issues were taken up for detailed discussion. The groups were further advised to make self-assessment and place their opinion on the various CSR programmes and their efficacy and utility.

### 6.5.2 Awareness of the Communities Regarding CSR Activities

In order to have views of the villagers on the impact of CSR related activities, more than 60 Focus Group Discussions (FGDs) were held in the CSR villages. On the whole, more than 70% of the total groups were aware that their villages had been selected for execution of CSR activities. However less than 30% of the groups primarily from Buffer Zone II villages were not aware of various community beneficiary oriented CSR activities being undertaken by AF-REGL.

Of the 40 aware groups, about 75% informed that infrastructural development of their villages are being done under the CSR activities of the AF-REGL. Nearly 65% also revealed that they are being provided skill development training for youth for better employment opportunities.

### 6.5.3 Implementation Process of CSR Activities: Responses of the Local Communities

A participatory approach is being taken up to assess the need of the village and its people. This bottom-up approach forms the basis of the success of CSR activities. Majority of the groups (40) were of the view that the activities were undertaken as per decision taken by the AF-REGL officials. About 60% and 65% of the groups stated that they were cognizant of the decision making authority for CSR activities and that Gram Pradhan along with AF-REGL officials and school teachers took the decision on behalf of the villagers. The CSR activities were mostly

conducted in consultation with the village heads or representatives, the involvement of the local villagers was also moderate to high.

After the decision for conducting any activity under CSR was taken up by the decision making authority, 60% of the groups viewed that the particular activity was put up for discussion with Gram Pradhan, teachers and AF-REGL officials. 70% FGD groups also viewed that meeting with local people of the community were held to understand the need for the particular work.

The CSR activities show its impact in terms of fulfilment of the expectations of the local people. About 75% of the groups opined that assessment of the local needs before execution of CSR activities was highly effective. Of the total groups, about 40 groups opined that their consent was taken before initiation of CSR activities. However, remaining groups expressed their resentment that no prior opinion was taken from the local people.

Involvement of the local people in execution of the CSR activities was limited. About 30% of the groups informed that no participation of the local people was ensured. Yet another 20% informed that the level of participation of the people was very low.

More than 65% of the groups informed that the responsibility for monitoring of the work done and executed by AF-REGL is taken up by the AF-REGL officials. Nearly 60% groups also opined that the Panchayat members have taken up interest in up-keeping and protection of the community property created by AF-REGL under CSR activities.

#### **6.5.4 Assessment of Need of the Villagers Prior to Execution of CSR Activities**

Programmes like deepening of ponds and construction of check dam, CC roads & bridges/culvert, installation of bore wells were perceived as very high priority areas by the villagers. Similarly, the programmes for improvement of health and sanitation facilities, assistance for construction of toilets, skill development for unemployed youth were considered next priority area for intervention under CSR activities. There were some programmes that were considered unnecessary from the point of view of the groups. Construction of bus stop and benches, village gate and sabha mandap, etc were considered as least priority area by few groups.

#### **6.5.5 Quality of Works: Opinion of the Communities**

To ascertain public opinion on the quality of the work done under CSR, the groups were asked to grade their perception/opinion on the various activities undertaken. While activities like construction of check dam and deepening of ponds and streams, installation of hand pumps & RO units, construction of community hall and school building were rated as 'very good', however

activities like construction of Anganwadi centre, sabhamandap, crematorium, etc. were opined by few groups as 'average'. All these activities were perceived to be highly beneficial for the upliftment of the quality of life of local people around REGL's TPP including water intake and pipeline as well as railway corridor.

All the groups opined that there are significant changes in the village socio-economic and cultural environment with initiation and implementation of CSR activities, though in varying degrees. More than 70% groups were of the view that the availability of drinking water has improved and will further enhance in future due to deepening of pond and construction of check dam as a part of CSR activity in the vicinity of REGL's TPP. Building of school boundary wall has helped in keeping out stray animals, maintaining clean environment of school, and children safety inside the compound.

#### **6.5.6 Impact of CSR Benefits on Target Families: Opinion of the Local Communities**

Almost all the groups opined that CSR activities have had considerable impact ('good or very good') on the living conditions of the target beneficiaries. Furnishing the infrastructure of the classrooms was opined to have very good impact on the targeted beneficiaries and high impact on their living.

Of the total number of 60 groups surveyed, more than 40 admired the quality of works conducted by AF-REGL under CSR. About 70% of the groups opined that with the efforts of AF-REGL the availability of safe drinking water has improved. Similarly, 60% and 65% voted for very high quality as per their required standards of materials provided to them for training and boring depth of the hand pumps respectively. Quality of check dam and CC/Pitch road construction, construction of community hall were also appreciated. However, few groups opined that the quality of work was 'moderate'.

#### **6.5.7 Need for Alternatives Activities in Lieu of Activities Performed**

About 30% of the groups from buffer zone villages opined that other alternate activities should have been conducted in their villages as per their priority needs. Contrary to this, about 70% groups opined that the CSR activities conducted in their villages are as per their priority need and no need of alternative activities to be conducted in place of already executed activities.

Around 25-30% groups which opined that alternate activities could better address or suit the needs of their villages are required to be conducted. Such groups placed a very high need for development of irrigation facilities and better drinking water facilities. This demand was placed



by most of the groups. Nearly 10-15 groups also placed their need for strengthening drinking water facilities and construction of toilet facilities to their respective villages. Construction of rainwater harvesting structure, provision of skill development training which has got high employment potential and provision of tap water supply were also other important needs as placed by the groups.

### **6.5.8 Changes as Perceived by Villagers in Different Time Intervals**

There were few groups which viewed that alternate activities that better suited the needs of their village were required to be conducted and placed the reasons for which the required activities were not conducted in their villages. Apathy of the officials towards the comprehensive need-assessment of the villages was cited as the major reason for non-execution of required activities (30%). Another major reason was that the performed activities were done not in consultation with the villagers (15-20%). This was especially true for the work conducted in the buffer zone villages.

The groups felt that there have been major positive as well as negative changes in the village in varying magnitude. As a positive change or transformation, more than 70% groups opined that there has been good to very good changes in the well-beings of people in the village. About 65% of the groups believed that the quality of education and its prospects has improved considerably. heralding an era of change and as an indication of women's improved status in the society and empowerment of women, more than 75% of the groups opined that women now participate in the public sphere and could work outside. Similarly, more than 70% opined that the decision making autonomy of women has also improved. Against 75% groups that were of the view that the social relations well-being of the villagers and employment opportunities as well as cultivation have improved significantly in the last three years, About 25% groups also viewed that the social relation in the village had worsened due to economic disparity. As a paradox to these positive changes, there have been some sectors viz cost of land, availability of cheap labour, etc that had slight negative impact in the last three years.

## **6.6 EVALUATION OF IMPACT OF CSR ACTIVITIES**

To evaluate the social impact of the CSR activities undertaken by AF-REL, ranking of impact in the basic amenities and infrastructural facilities besides the livelihood pattern were undertaken in consultation with local people and village representatives during the FGDs conducted in the CSR villages. The overall impact evaluation of CSR activities undertaken were rated in selected areas, viz., road, drinking water, education, health, drainage and sanitation, skill development training,

irrigation, veterinary service and sports in the scale 1 to 5, i.e. 1: Poor, 2: Average, 3: Good, 4: Very good and 5: Excellent.

The prime social impact of the CSR activities undertaken by AF-REGL in the rural infrastructure, education facilities, health facilities including level of awareness regarding health, hygiene and various social issues, agricultural pattern, skill development training opportunities, socio-cultural improvement, etc are presented in subsequent sections.

### 6.6.1 EVALUATION OF EDUCATIONAL FACILITIES

Zone wise detail of assessment of educational facilities in surveyed CSR villages are presented in Table 6.2 and Figure 6.2. The analysis reveals that out of 4 surveyed CSR villages in core zone, in case of two villages, namely, Bade Bhandar and Chhote Bhandar villages, existing educational facilities is good. Whereas in case of remaining two villages, existing educational facilities is average. Out of 23 CSR villages in buffer Zone-I, in case of 12 villages, existing educational facilities is good. Whereas in case of 8 villages, existing educational facilities is average. Out of 39 CSR villages in buffer zone-II, in case of 31 villages, existing educational facilities is average. Whereas in case of 2 villages, existing educational facilities is excellent.

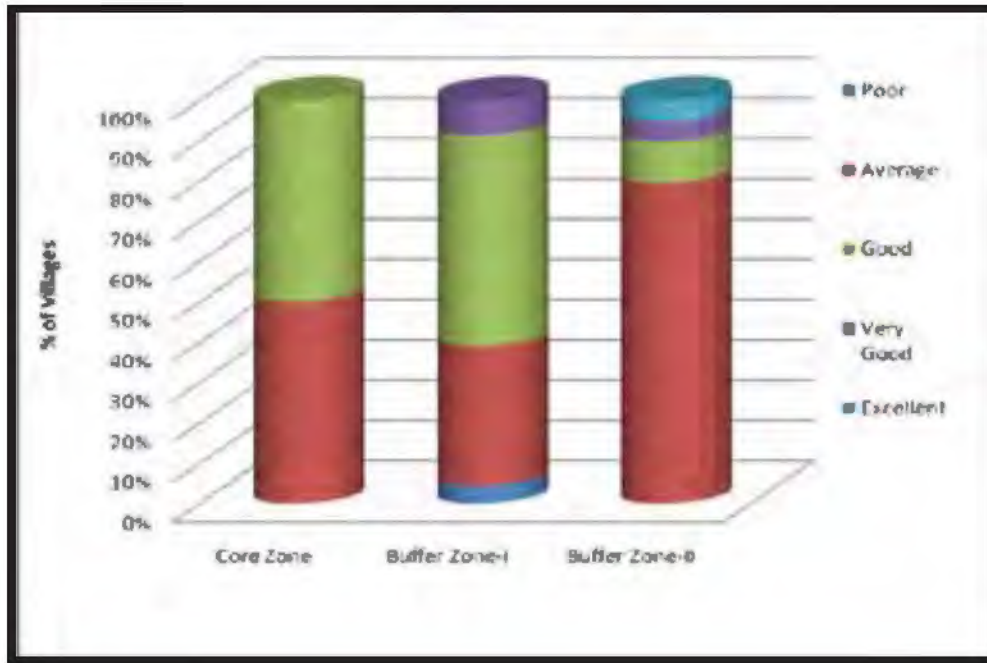
Overall analysis shows that out of 66 surveyed CSR villages, in case of 62.12% CSR villages, existing educational facilities is average (Figure 6.3). Whereas in case of 3.03% villages, existing educational facilities is excellent.

**TABLE 6.2: ASSESSMENT OF EXISTING EDUCATIONAL FACILITIES IN CSR VILLAGES**

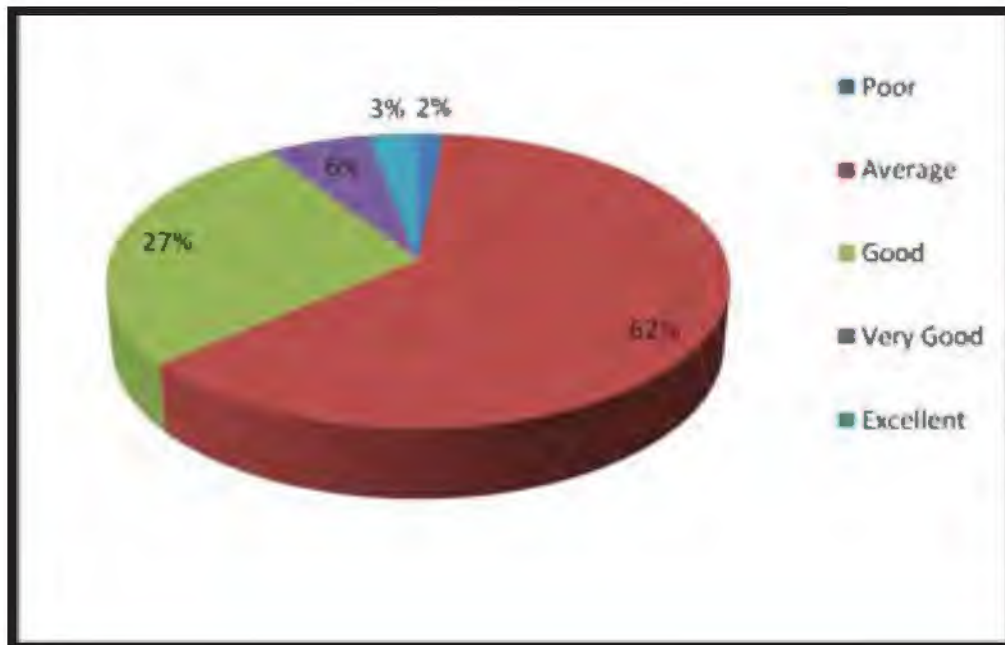
Sl No.	CSR Villages	Rating of Educational Facilities				
		1	2	3	4	5
1	Core Zone	-	50.00	50.00	-	-
2	Buffer Zone I	4.35	34.78	52.17	8.70	-
3	Buffer Zone II	-	79.49	10.26	5.13	5.13
	<b>Overall</b>	<b>1.52</b>	<b>62.12</b>	<b>27.27</b>	<b>6.06</b>	<b>3.03</b>

Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent

**FIGURE 6.2: CSR ZONE-WISE EVALUATION OF EXISTING EDUCATIONAL FACILITIES**



**FIGURE 6.3: EVALUATION OF EXISTING EDUCATIONAL FACILITIES IN CSR VILLAGES**



## 6.6.2 EVALUATION OF VILLAGE ROAD NETWORK

### Village Access Road

Zone wise detail of assessment of village access road in surveyed CSR villages are presented in Table 6.3 and Figure 6.4. The analysis reveals that out of 4 surveyed CSR villages in core zone, in case of 2 villages, namely, Chhote Bhandar and Amla Bhouna vilages, existing village access road network is very good. Whereas in case of one village, namely Bade Bhandar under Pusour Block, existing village access road network is excellent. Out of 23 CSR villages in buffer Zone-I, in case of 13 villages, existing village access road network is good. Whereas in case of one village, namely Supa, existing village access road network is excellent. However, in buffer zone-II, in case of 19 villages, existing village access road network is good. Whereas in case of 14 villages, existing village access road network is very good.

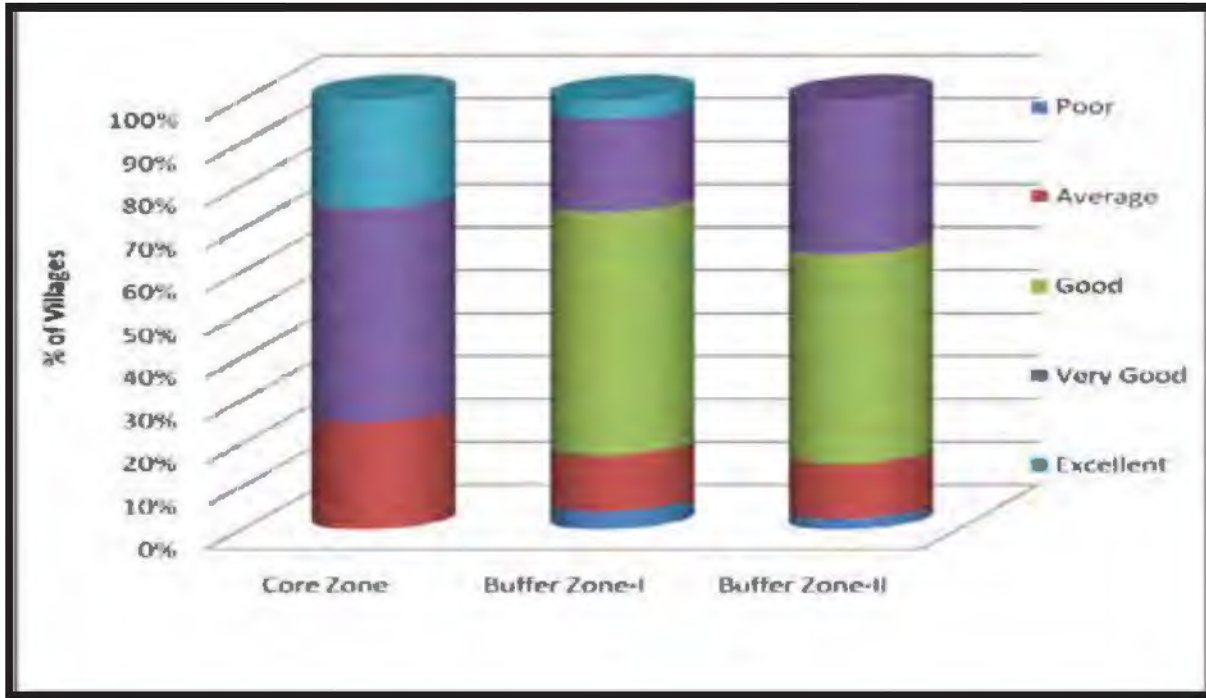
Overall analysis shows that out of surveyed CSR villages, in case of 48.48% CSR villages, existing village access road network is good (Figure 6.5). Whereas in case of 3.03% villages, existing village access road network is poor, though in case of 31.82% CSR villages, existing village access road network is very good.

**TABLE 6.3: ASSESSMENT OF EXISTING VILLAGE ACCESS ROAD  
IN CSR VILLAGES**

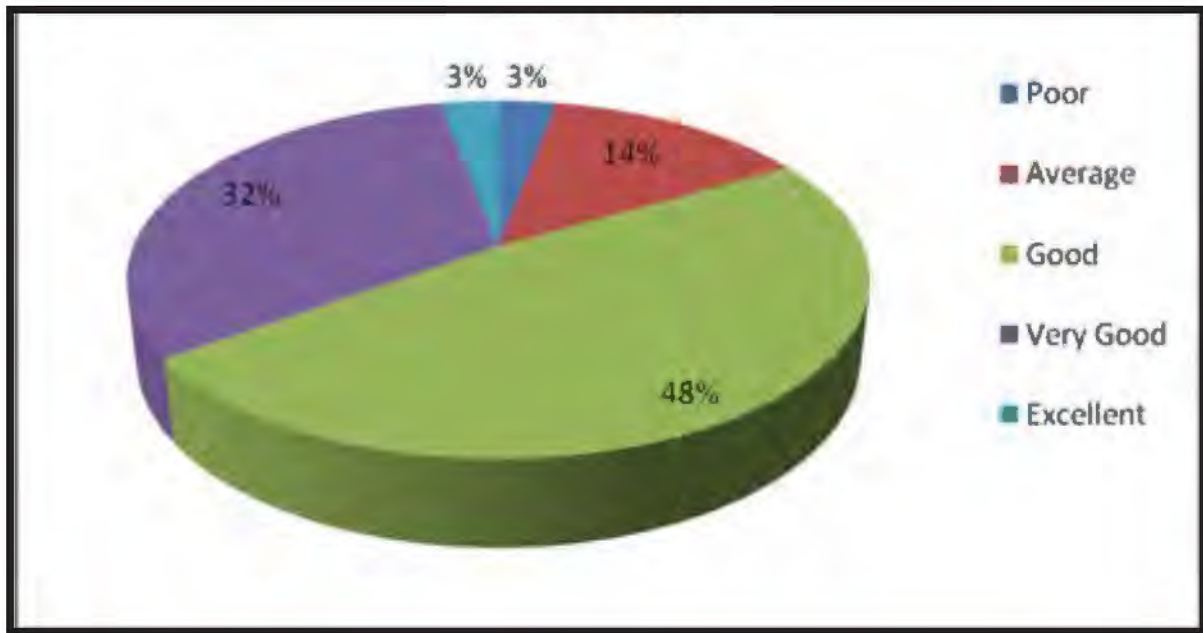
Sl No.	CSR Villages	Rating of Village Access Road Facilities				
		1	2	3	4	5
1	Core Zone	-	25.00	-	50.00	25.00
2	Buffer Zone I	4.35	13.04	56.52	21.74	4.35
3	Buffer Zone II	2.56	12.82	48.72	35.90	-
<b>Overall</b>		<b>3.03</b>	<b>13.64</b>	<b>48.48</b>	<b>31.82</b>	<b>3.03</b>

Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent

**FIGURE 6.4: CSR ZONE-WISE EVALUATION OF EXISTING VILLAGE ACCESS ROAD**



**FIGURE 6.5: EVALUATION OF EXISTING VILLAGE ACCESS ROAD IN CSR VILLAGES**



### Internal Village Road

Zone wise detail of assessment of internal village road in surveyed CSR villages are presented in Table 6.4 and Figure 6.6. The analysis reveals that out of 4 CSR villages in core zone, in case of 3 villages, namely Sarvani, Chhote Bhandar and Amli Bhouna villages, existing internal village road network is good. Whereas in case of only one village, namely Bade Bhandar village under Pusour Block, existing internal village road network is very good.

Out of 23 surveyed CSR villages in Buffer Zone-I, in case of 10 villages, existing internal village road network is good. Whereas in case of 3 villages, existing internal village road network is very good. Out of surveyed villages in buffer zone-II, in case of 20 villages, existing internal village road network is good. Whereas in case of 4 villages, existing internal village road network is very good.

Overall analysis shows that out of surveyed CSR villages, in case of 50% CSR villages, existing internal village road network is good (Figure 6.7). Whereas in case of 3.03% villages, existing internal village road network is poor, though in case of 12.12% CSR villages, existing internal village road network is very good.

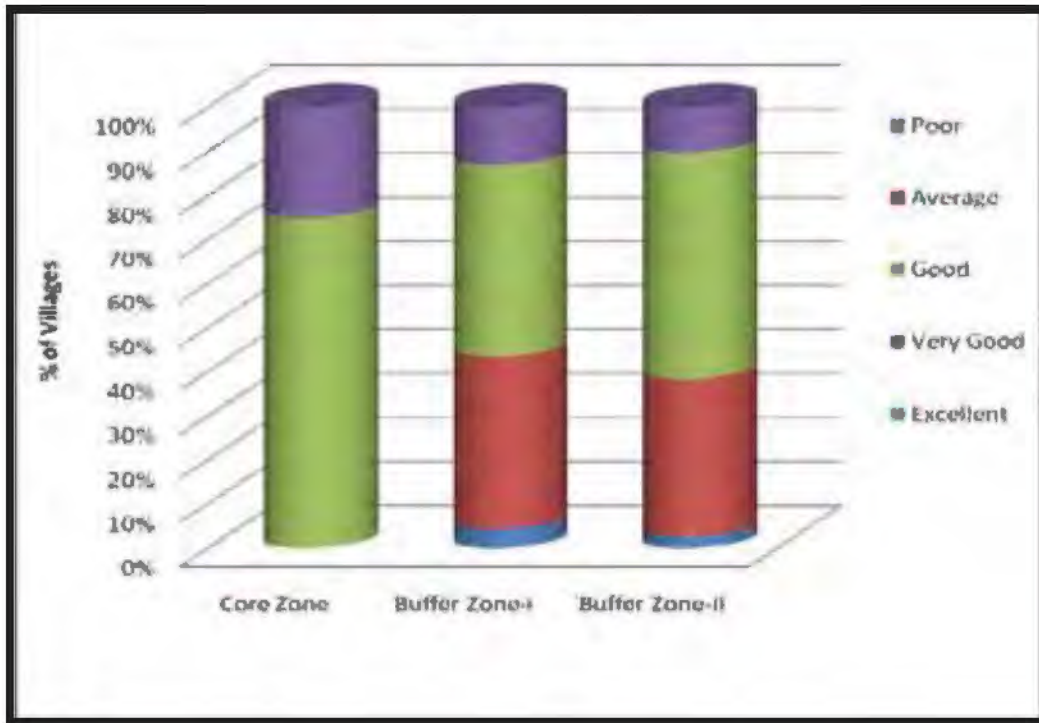
**TABLE 6.4: ASSESSMENT OF EXISTING INTERNAL VILLAGE ROAD  
IN CSR VILLAGES**

Sl No.	CSR Villages	Rating of Internal Village Road Facilities				
		1	2	3	4	5
1	Core Zone	-	-	75.00	25.00	-
2	Buffer Zone I	4.35	39.13	43.48	13.04	-
3	Buffer Zone II	2.56	35.90	51.28	10.26	-
<b>Overall</b>		<b>3.03</b>	<b>34.85</b>	<b>50.00</b>	<b>12.12</b>	-

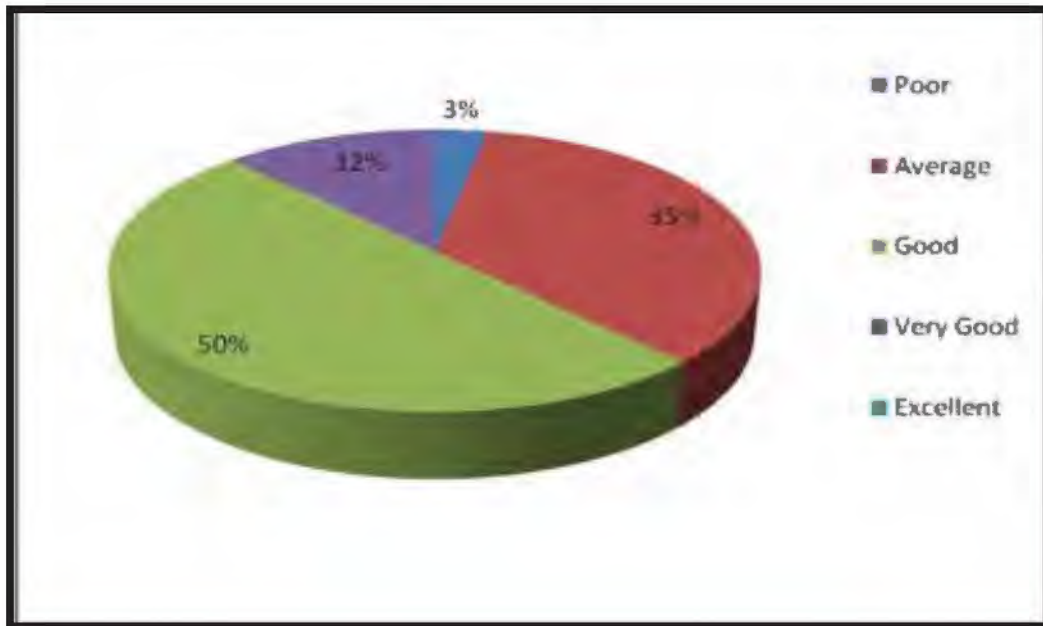
Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent



**FIGURE 6.6: CSR ZONE-WISE EVALUATION OF EXISTING INTERNAL VILLAGE ROAD**



**FIGURE 6.7: EVALUATION OF EXISTING INTERNAL VILLAGE ROAD IN CSR VILLAGES**



### 6.6.3 EVALUATION OF DRINKING WATER FACILITIES

Zone wise detail of assessment of drinking water facilities in surveyed CSR villages are presented in Table 6.5 and Figure 6.8. The analysis reveals that out of 4 surveyed CSR villages in core zone, in case of 3 villages, existing drinking water facilities is good. Whereas in case of one village, namely, Chhote Bhandar village, existing drinking water facilities is very good. Out of 23 CSR villages in buffer Zone-I, in case of 11 villages, existing drinking water facilities is good. Whereas in case of 4 villages, existing drinking water facilities is very good. Out of surveyed CSR villages in buffer zone-II, in case of 19 villages, existing drinking water facilities is good. Whereas in case of 8 villages, existing drinking water facilities is very good.

Overall analysis shows that out of surveyed CSR villages, in case of 50% CSR villages, existing drinking water facilities is good (Figure 6.9). Whereas in case of 28.79% villages, existing drinking water facilities is average, though in case of 1.52% of CSR villages, existing drinking water facilities is excellent.

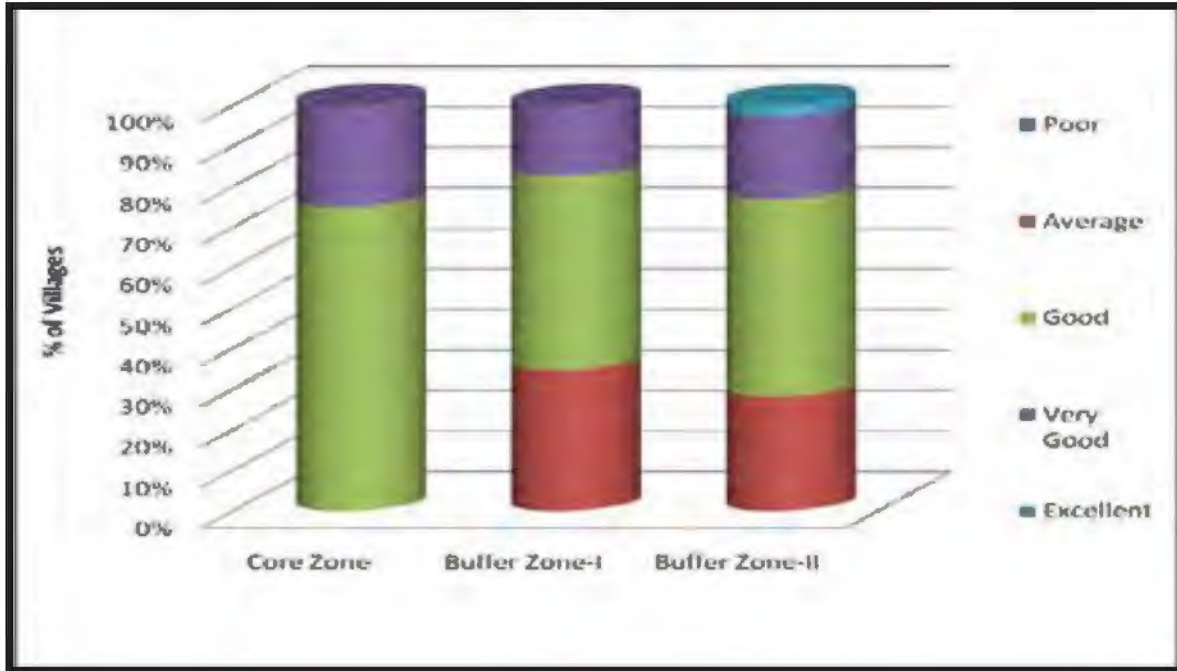
**TABLE 6.5: ASSESSMENT OF EXISTING DRINKING WATER FACILITIES IN CSR VILLAGES**

Sl No.	CSR Villages	Rating of Drinking Water Facilities				
		1	2	3	4	5
1	Core Zone	-	-	75.00	25.00	-
2	Buffer Zone I	-	34.78	47.83	17.39	-
3	Buffer Zone II	-	28.21	48.72	20.51	2.56
<b>Overall</b>		-	<b>28.79</b>	<b>50.00</b>	<b>19.70</b>	<b>1.52</b>

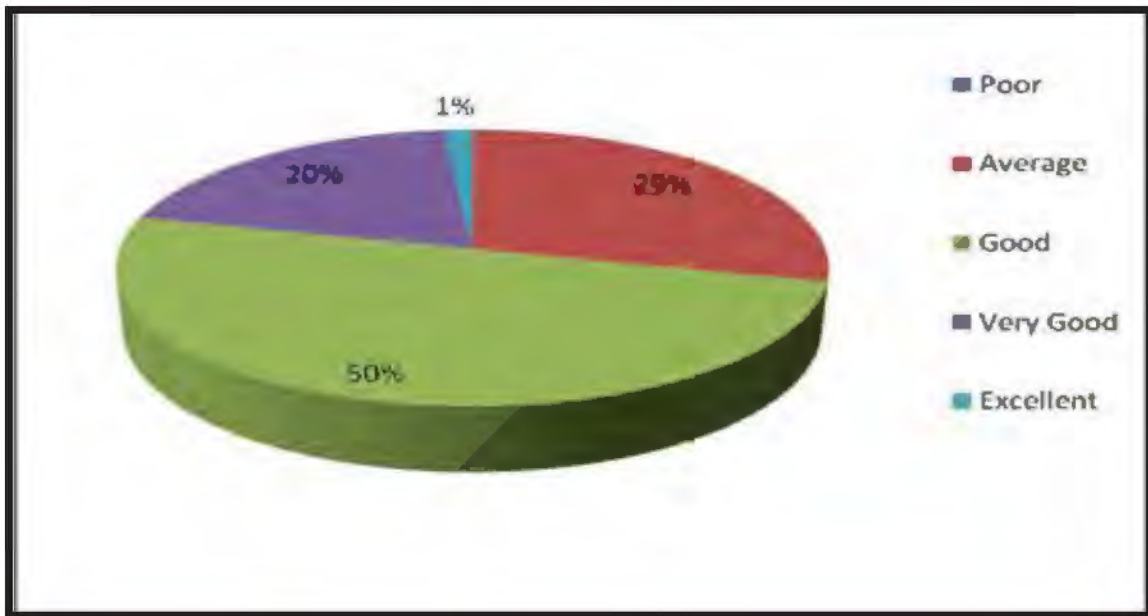
Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent



**FIGURE 6.8: CSR ZONE-WISE EVALUATION OF EXISTING DRINKING WATER FACILITIES**



**FIGURE 6.9: EVALUATION OF EXISTING DRINKING WATER FACILITIES IN CSR VILLAGES**



#### 6.6.4 EVALUATION OF HEALTH FACILITIES

Zone wise detail of assessment of health facilities in surveyed CSR villages are presented in Table 6.6 and Figure 6.10. The analysis reveals that out of 4 CSR villages in core zone, in case of 3 villages, existing health facilities is good. Whereas out of 23 villages in buffer Zone-I, in case of 12 villages, existing health facilities is average, though in case of 5 villages, existing health facilities is good. Out of surveyed CSR villages in buffer zone-II, in case of 25 villages, existing health facilities is average. Whereas in case of 6 villages, existing health facilities is good.

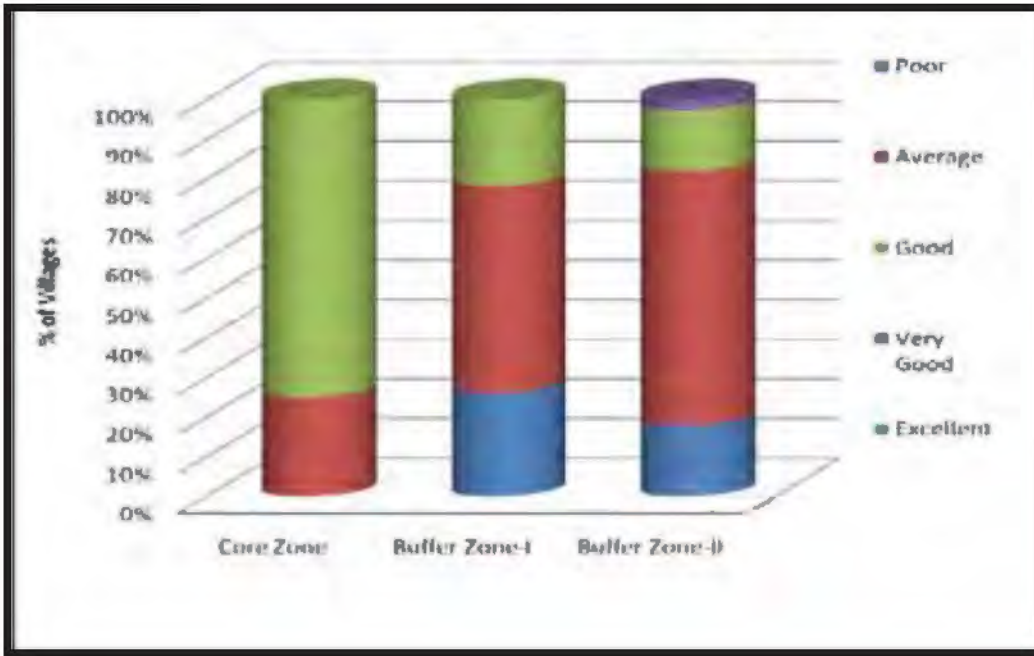
Overall analysis shows that out of surveyed CSR villages, in case of 57.58% CSR villages, existing health facilities is average (Figure 6.11). Whereas in case of 21.21% villages, existing health facilities is good.

**TABLE 6.6: ASSESSMENT OF EXISTING HEALTH FACILITIES  
IN CSR VILLAGES**

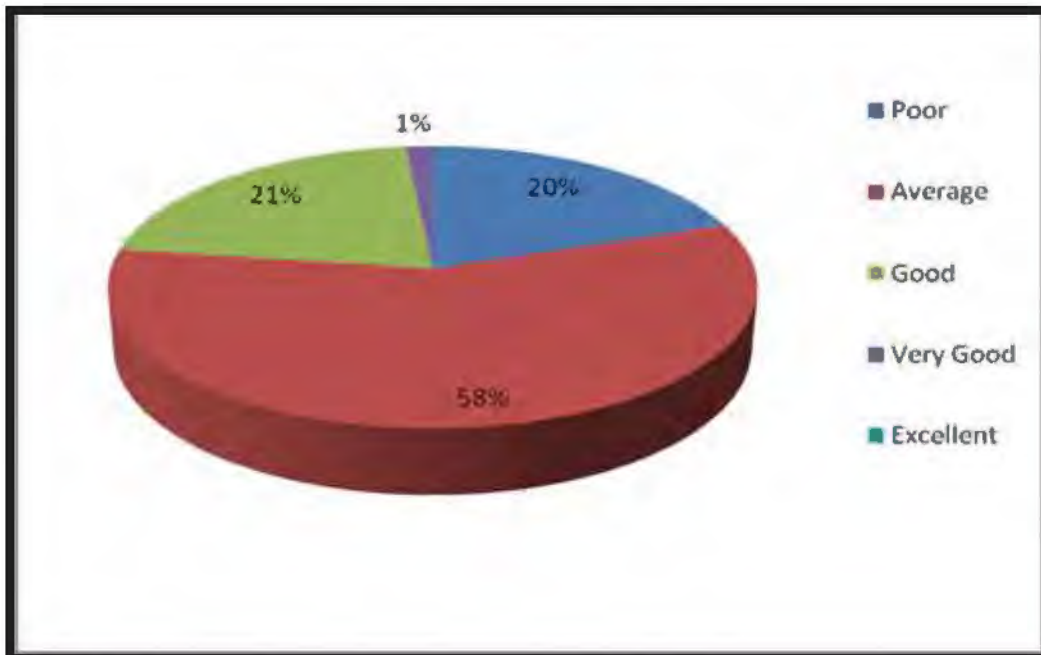
Sl No.	CSR Villages	Rating of Health Facilities				
		1	2	3	4	5
1	Core Zone	-	25.00	75.00	-	-
2	Buffer Zone I	26.09	52.17	21.74	-	-
3	Buffer Zone II	17.95	64.10	15.38	2.56	-
<b>Overall</b>		<b>19.70</b>	<b>57.58</b>	<b>21.21</b>	<b>1.52</b>	<b>-</b>

Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent

**FIGURE 6.10: CSR ZONE-WISE EVALUATION OF EXISTING HEALTH FACILITIES**



**FIGURE 6.11: EVALUATION OF EXISTING HEALTH FACILITIES IN CSR VILLAGES**



### 6.6.5 EVALUATION OF DRAINAGE FACILITIES

Zone wise detail of assessment of drainage facilities in surveyed CSR villages are presented in Table 6.7 and Figure 6.12. The analysis reveals that out of 4 CSR villages in core zone, in case of 3 villages, existing drainage facilities is average. Whereas in case of remaining one village, namely, Chhote Bhandar village, existing drainage facilities is poor.

Out of 23 CSR villages in buffer Zone-I, in case of 16 villages, existing drainage facilities is poor. Whereas in case of 5 villages, existing drainage facilities is average. Out of surveyed CSR villages in buffer zone-II, in case of 25 villages, existing drainage facilities is poor. Whereas in case of one village, namely Putkapuri village under Pusour Block, existing drainage facilities is good.

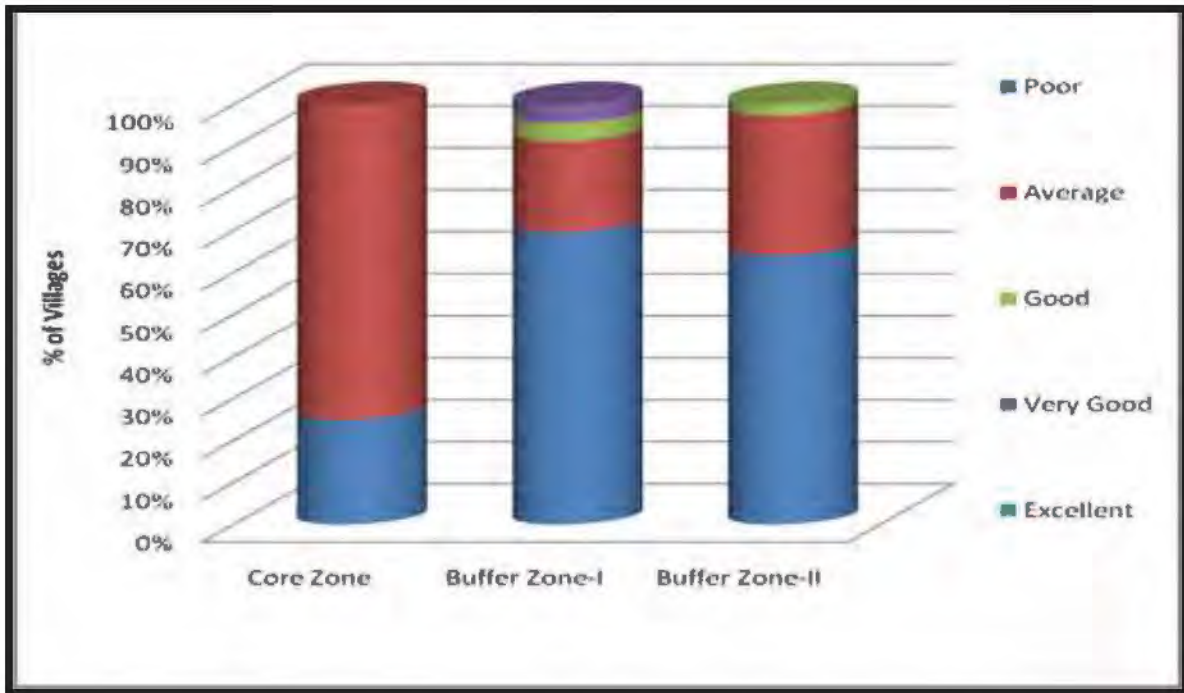
Overall analysis shows that out of surveyed CSR villages, in case of only 3.03% CSR villages, existing drainage facilities is good (Figure 6.13). Whereas in case of 63.64% villages, existing drainage facilities is poor, though in case of 31.82% CSR villages, existing drainage facilities is average.

**TABLE 6.7: ASSESSMENT OF EXISTING DRAINAGE FACILITIES  
IN CSR VILLAGES**

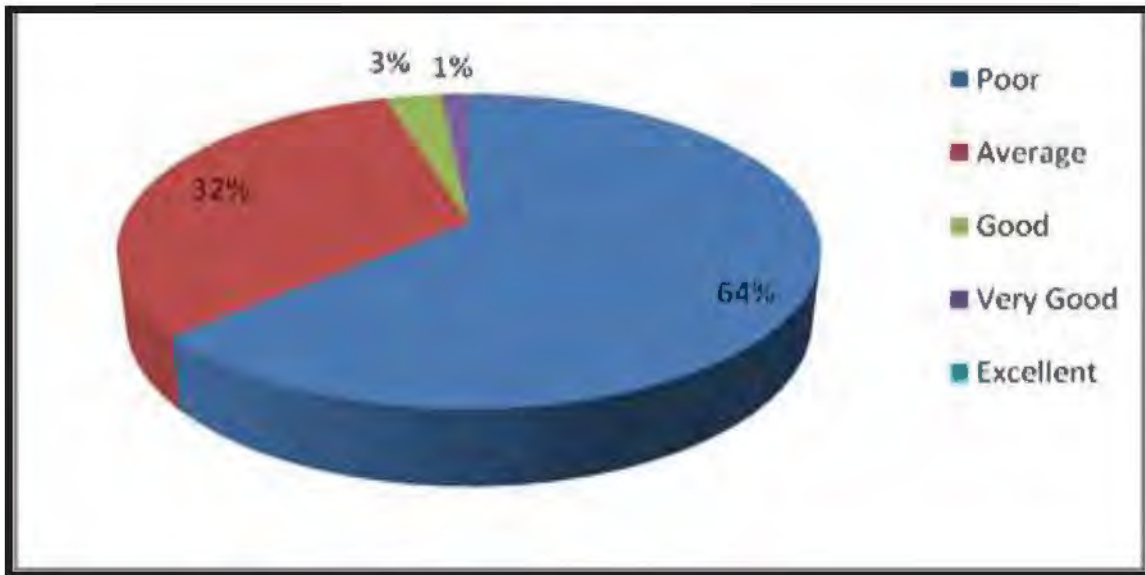
Sl No.	CSR Villages	Rating of Drainage Facilities				
		1	2	3	4	5
1	Core Zone	25.00	75.00	-	-	-
2	Buffer Zone I	69.57	21.74	4.35	4.35	-
3	Buffer Zone II	64.10	33.33	2.56	-	-
<b>Overall</b>		<b>63.64</b>	<b>31.82</b>	<b>3.03</b>	<b>1.52</b>	<b>-</b>

Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent

**FIGURE 6.12: CSR ZONE-WISE EVALUATION OF EXISTING DRAINAGE FACILITIES**



**FIGURE 6.13: EVALUATION OF EXISTING DRAINAGE FACILITIES IN CSR VILLAGES**



### 6.6.6 EVALUATION OF SANITATION FACILITIES

Zone wise detail of assessment of sanitation facilities in surveyed CSR villages are presented in Table 6.8 and Figure 6.14. The analysis reveals that out of 4 CSR villages in core zone, in case of one village, namely Bade Bhandar village under Pusour Block, existing sanitation facilities is very good. Whereas in case of one village, namely, Amlu Bhouna village existing sanitation facilities is poor and in case of one village, namely Sarvani village existing sanitation facilities is average. Out of 23 surveyed villages in buffer Zone-I, in case of 11 CSR villages, existing sanitation facilities is very good. Whereas in case of 9 villages, existing sanitation facilities is average. Out of surveyed CSR villages in buffer zone-II, in case of 14 villages, existing sanitation facilities is very good. Whereas in case of 2 villages, namely, Badimal and Putkapuri villages under Pusour Block, existing sanitation facilities is excellent.

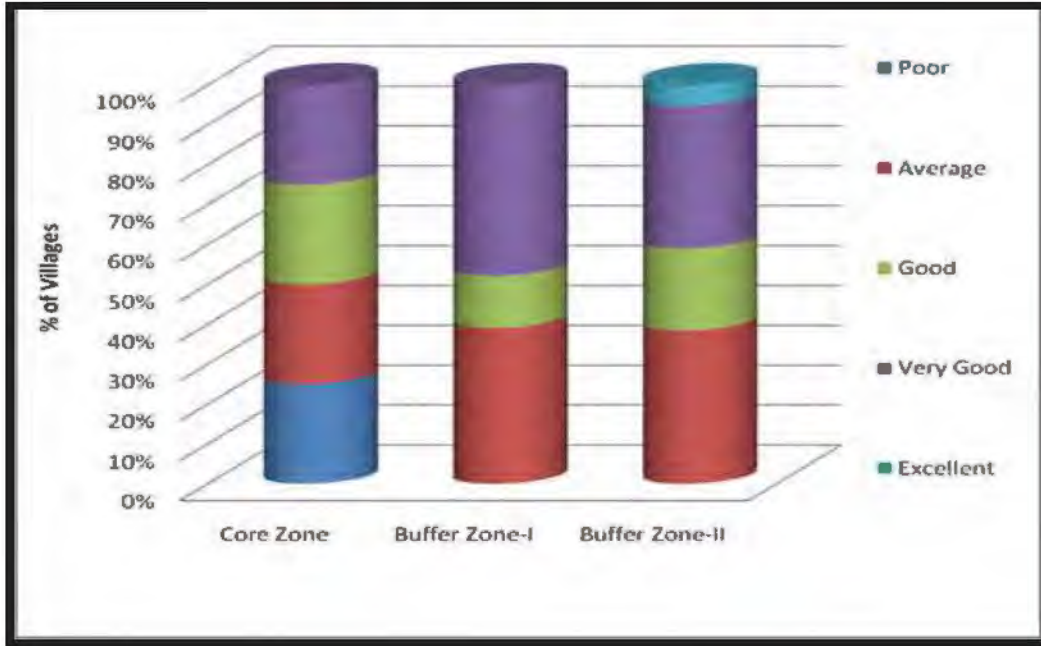
Overall analysis shows that out of surveyed CSR villages, in case of 39.39% CSR villages, existing sanitation facilities is very good (Figure 6.15). Whereas in case of 37.88% villages, existing sanitation facilities is average, though in case of 2 CSR villages, existing sanitation facilities is excellent.

**TABLE 6.8: ASSESSMENT OF EXISTING SANITATION FACILITIES  
IN CSR VILLAGES**

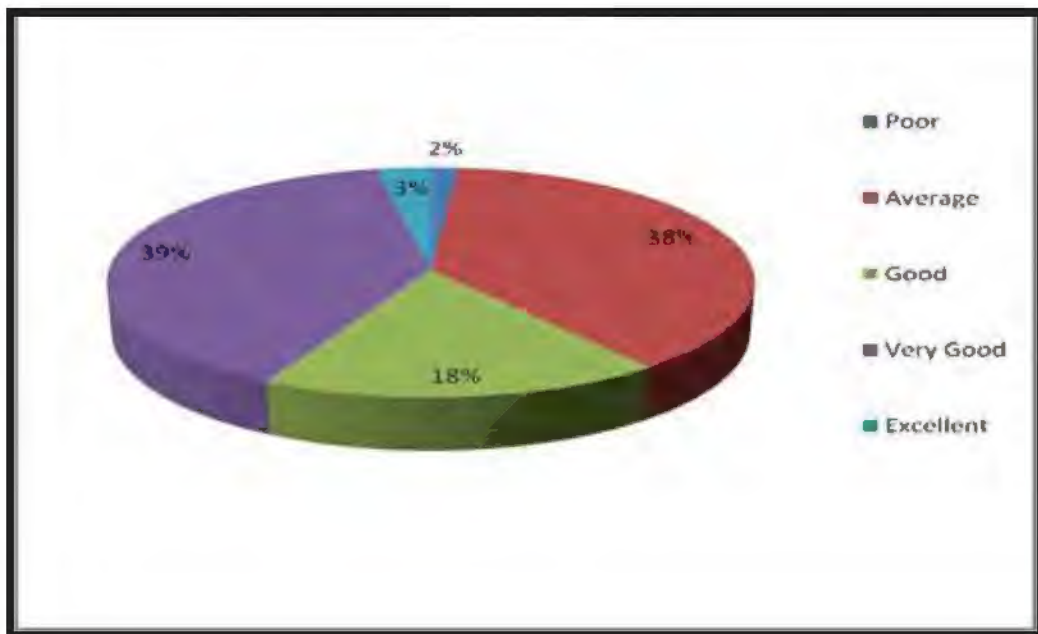
SI No.	CSR Villages	Rating of Sanitation Facilities				
		1	2	3	4	5
1	Core Zone	25.00	25.00	25.00	25.00	-
2	Buffer Zone I	-	39.13	13.04	47.83	-
3	Buffer Zone II	-	38.46	20.51	35.90	5.13
<b>Overall</b>		<b>1.52</b>	<b>37.88</b>	<b>18.18</b>	<b>39.39</b>	<b>3.03</b>

Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent

**FIGURE 6.14: CSR ZONE-WISE EVALUATION OF EXISTING SANITATION FACILITIES**



**FIGURE 6.15: EVALUATION OF EXISTING SANITATION FACILITIES IN CSR VILLAGES**



### 6.6.7 EVALUATION OF VOCATIONAL TRAINING FACILITIES

Zone wise detail of assessment of vocational training facilities in surveyed CSR villages are presented in Table 6.9 and Figure 6.16. The analysis reveals that in case of all 4 CSR villages in core zone, existing vocational training facilities is average. Out of 23 surveyed villages in buffer Zone-I, in case of 13 CSR villages, existing vocational training facilities is poor. Whereas in case of 9 villages, existing vocational training facilities is average. Out of 39 surveyed villages in buffer zone-II, in case of 22 CSR villages, existing vocational training facilities is average.

Overall analysis shows that out of surveyed CSR villages, in case of 53.03% CSR villages, existing vocational training facilities is average (Figure 6.17). Whereas in case of 40.91% villages, existing vocational training facilities is poor.

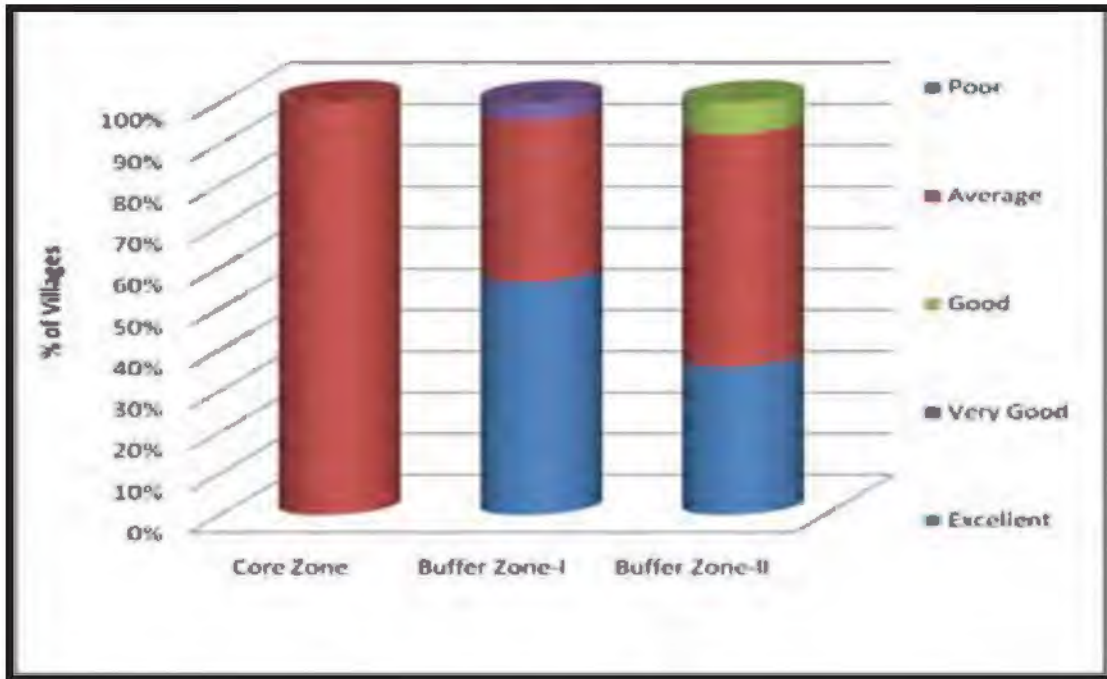
**TABLE 6.9: ASSESSMENT OF EXISTING VOCATIONAL TRAINING FACILITIES IN CSR VILLAGES**

Sl No.	CSR Villages	Rating of Vocational Training Facilities				
		1	2	3	4	5
1	Core Zone	-	100.00	-	-	-
2	Buffer Zone I	56.52	39.13	-	4.35	-
3	Buffer Zone II	35.90	56.41	7.69	-	-
	<b>Overall</b>	<b>40.91</b>	<b>53.03</b>	<b>4.55</b>	<b>1.52</b>	<b>-</b>

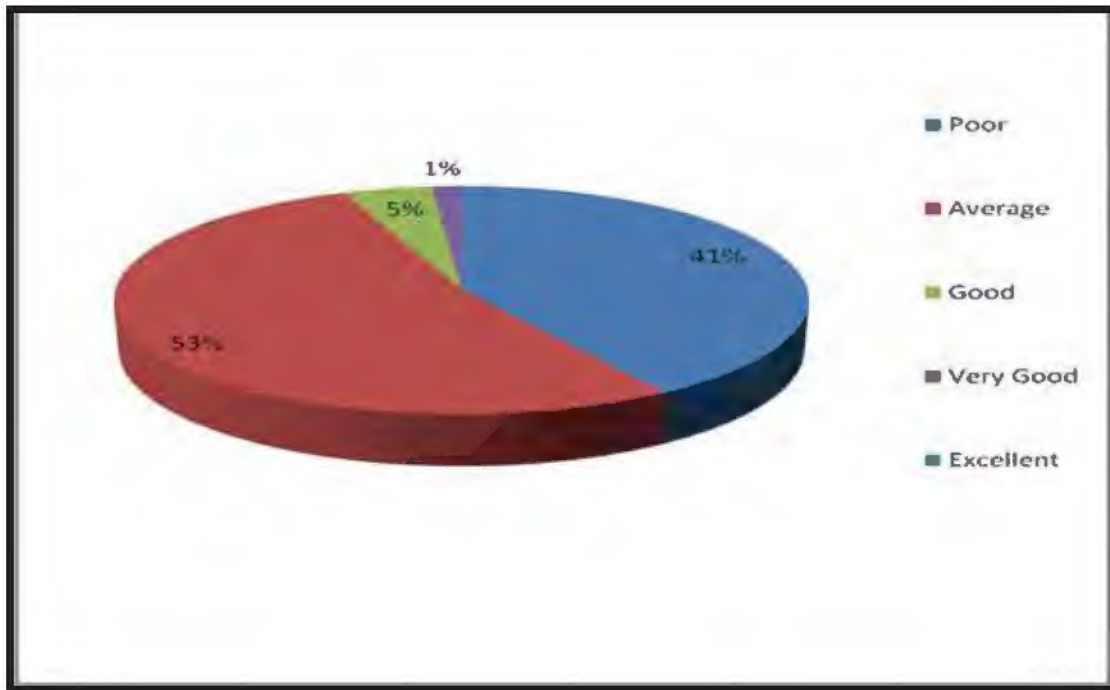
Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent



**FIGURE 6.16: CSR ZONE-WISE EVALUATION OF EXISTING VOCATIONAL TRAINING FACILITIES**



**FIGURE 6.17: EVALUATION OF EXISTING VOCATIONAL TRAINING FACILITIES IN CSR VILLAGES**



### 6.6.8 EVALUATION OF IRRIGATIONAL FACILITIES

Zone wise detail of assessment of irrigational facilities in surveyed CSR villages are presented in the Table 6.10 and Figure 6.18. The analysis reveals that in case of all 4 CSR villages in core zone, existing irrigational facilities is average.

Out of 23 villages in buffer Zone-I, in case of 16 villages, existing irrigational facilities is average. Whereas in case of 6 villages, existing irrigational facilities is good. Out of the surveyed CSR villages in buffer zone-II, in case of 25 villages, existing irrigational facilities is average, whereas in case of 8 villages, existing irrigational facilities is good.

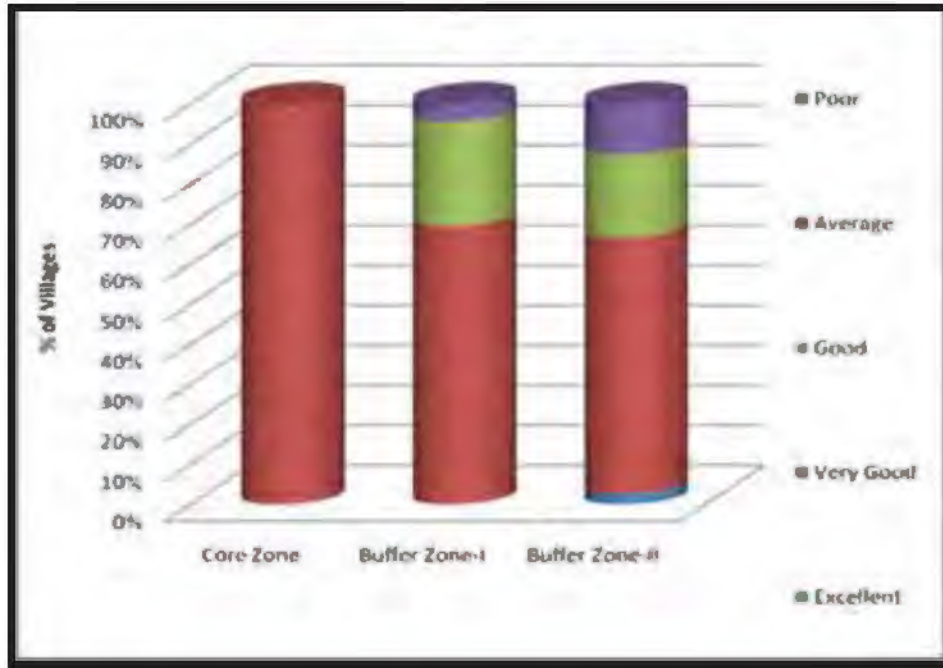
Overall analysis shows that out of surveyed CSR villages, in case of 21.21% CSR villages, existing irrigational facilities is good (Figure 6.19). Whereas in case of 1.52% villages, existing irrigational facilities is poor, though in case of 68.18% villages, existing irrigational facilities is average.

**TABLE 6.10: ASSESSMENT OF EXISTING IRRIGATIONAL FACILITIES  
IN CSR VILLAGES**

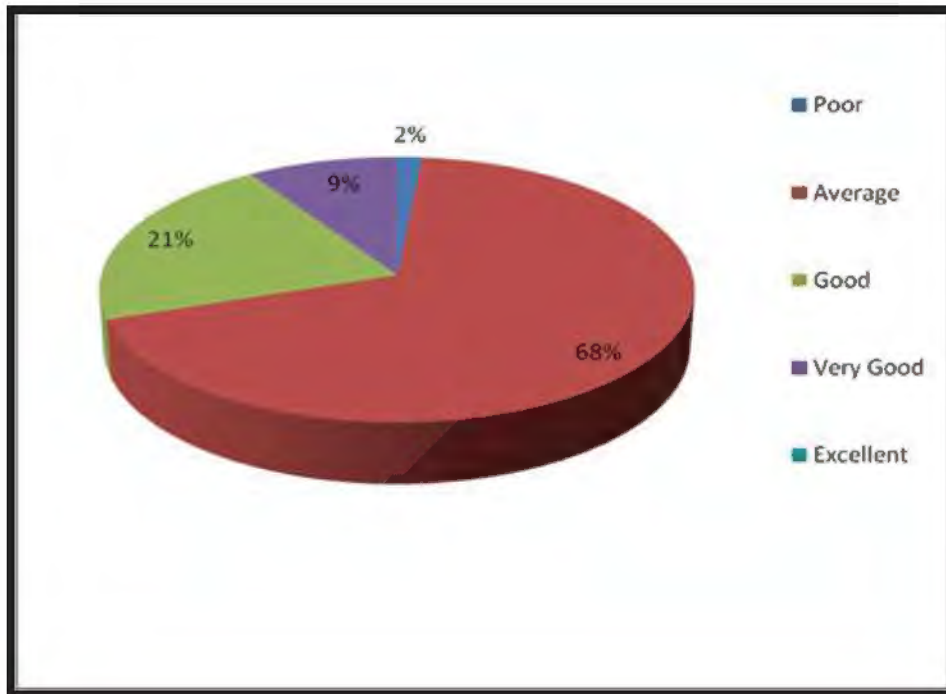
Sl No.	CSR Villages	Rating of Irrigation Facilities				
		1	2	3	4	5
1	Core Zone	-	100.00	-	-	-
2	Buffer Zone I	-	69.57	26.09	4.35	-
3	Buffer Zone II	2.56	64.10	20.51	12.82	-
<b>Overall</b>		<b>1.52</b>	<b>68.18</b>	<b>21.21</b>	<b>9.09</b>	<b>-</b>

Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent

**FIGURE 6.18: CSR ZONE-WISE EVALUATION OF EXISTING IRRIGATIONAL FACILITIES**



**FIGURE 6.19: EVALUATION OF EXISTING IRRIGATIONAL FACILITIES IN CSR VILLAGES**



### 6.6.9 EVALUATION OF VETERINARY FACILITIES

Zone wise detail of assessment of veterinary facilities in surveyed CSR villages are presented in Table 6.11 and Figure 6.20. The analysis reveals that out of 4 CSR villages in core zone, in case of 2 villages, namely, Sarvani and Chhote Bhandar villages, existing veterinary facilities is average. Whereas in case of remaining 2 villages, existing veterinary facilities is good.

Out of surveyed CSR villages in buffer Zone-I, in case of 16 villages, existing veterinary facilities is average. Whereas in case of 3 villages, existing veterinary facilities is good. Out of surveyed CSR villages in buffer zone-II, in case of 28 villages, existing veterinary facilities is average. Whereas in case of 9 villages, existing veterinary facilities is poor.

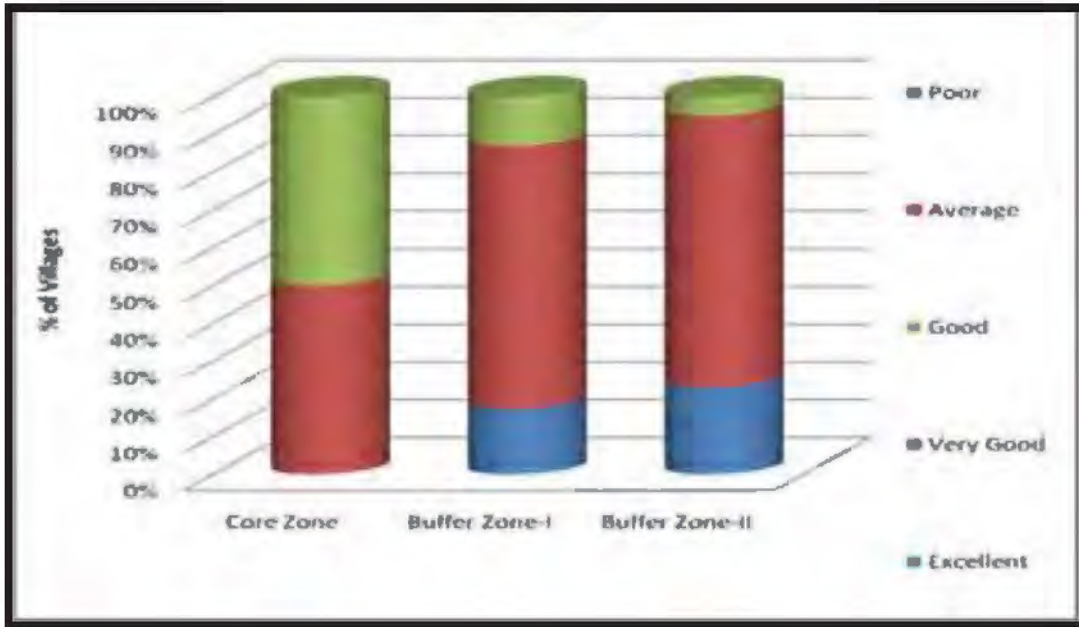
Overall analysis shows that out of surveyed CSR villages, in case of 69.70% CSR villages, existing veterinary facilities is average (Figure 6.21). Whereas in case of 19.70% villages, existing veterinary facilities is poor.

**TABLE 6.11: ASSESSMENT OF EXISTING VETERINARY FACILITIES  
IN CSR VILLAGES**

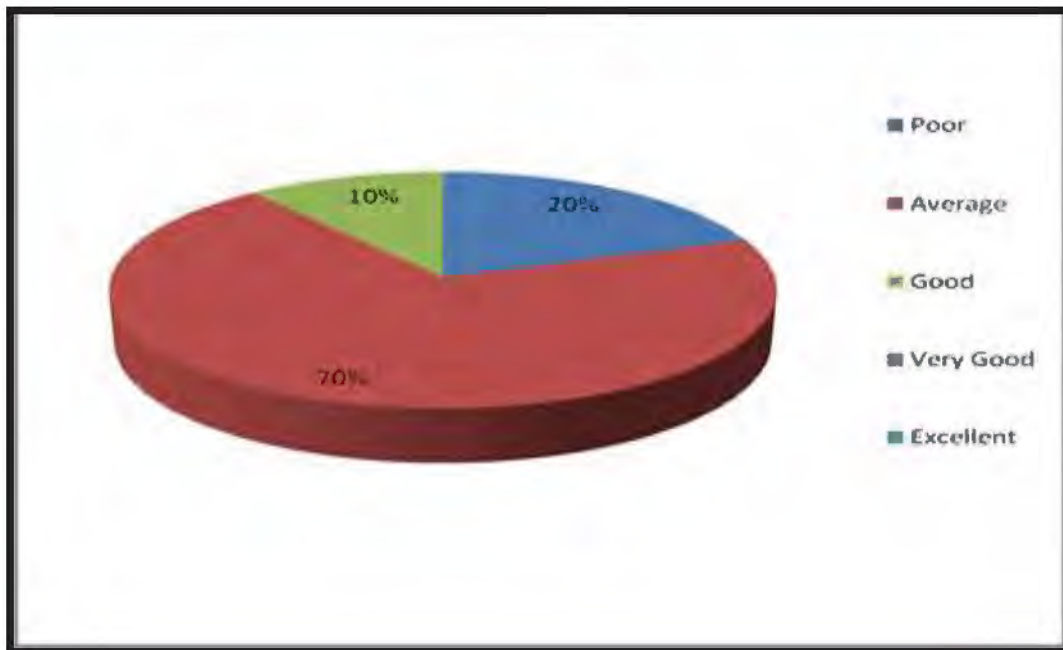
Sl No.	CSR Villages	Rating of Veterinary Facilities				
		1	2	3	4	5
1	Core Zone	-	50.00	50.00	-	-
2	Buffer Zone I	17.39	69.57	13.04	-	-
3	Buffer Zone II	23.08	71.79	5.13	-	-
	<b>Overall</b>	<b>19.70</b>	<b>69.70</b>	<b>10.61</b>	-	-

Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent

**FIGURE 6.20: CSR ZONE-WISE EVALUATION OF EXISTING VETERINARY FACILITIES**



**FIGURE 6.21: EVALUATION OF EXISTING VETERINARY FACILITIES IN CSR VILLAGES**



### 6.6.10 EVALUATION OF SPORTS FACILITIES

Zone wise detail of assessment of sports facilities in surveyed CSR villages are presented in Table 6.12 and Figure 6.22. The analysis reveals that out of 4 CSR villages in core zone, in case of one village, namely, Bade Bhandar village existing sports facilities is good. Whereas in case of another one village, namely, Sarvani village, existing sports facilities is poor.

Out of surveyed villages in buffer Zone-I, in case of 15 CSR villages existing sports facilities is poor. Whereas in case of remaining 8 villages, existing sports facilities is average. Out of surveyed villages in buffer zone-II, in case of 33 CSR villages existing sports facilities is poor. Whereas in case of 5 villages, existing sports facilities is average.

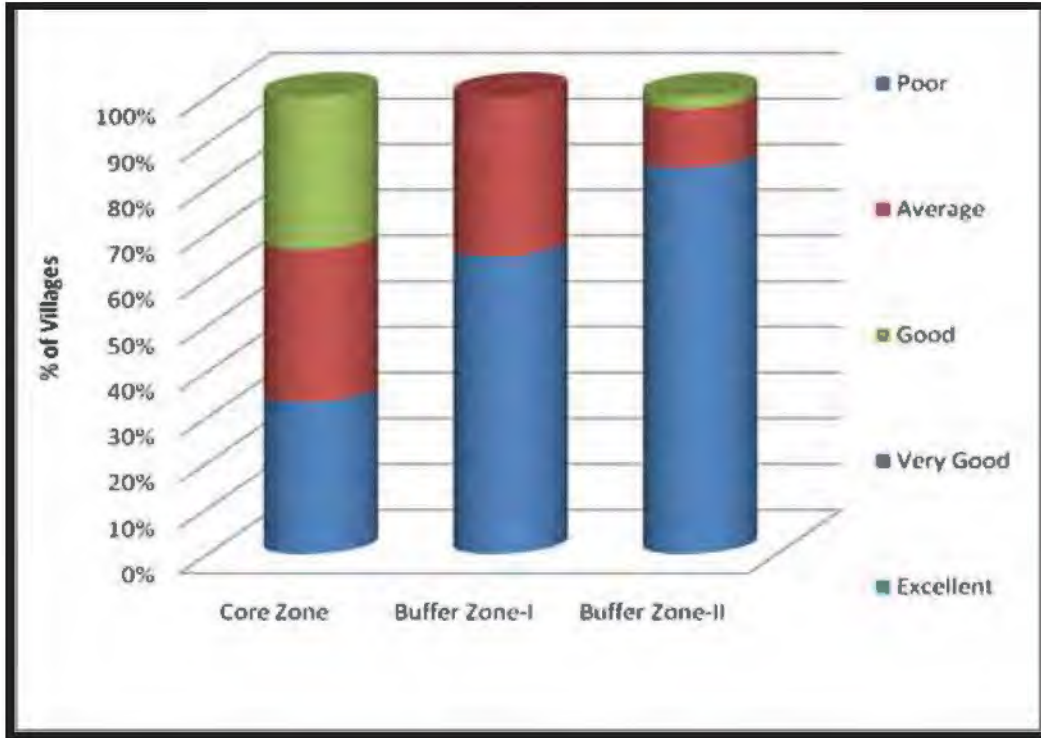
Overall analysis shows that out of surveyed CSR villages, in case of 3.08% CSR villages, existing sports facilities is good (Figure 6.23). Whereas in case of 75.38% villages, existing sports facilities is poor, though in case of 21.54% villages, existing sports facilities is average.

**TABLE 6.12: ASSESSMENT OF EXISTING SPORTS FACILITIES  
IN CSR VILLAGES**

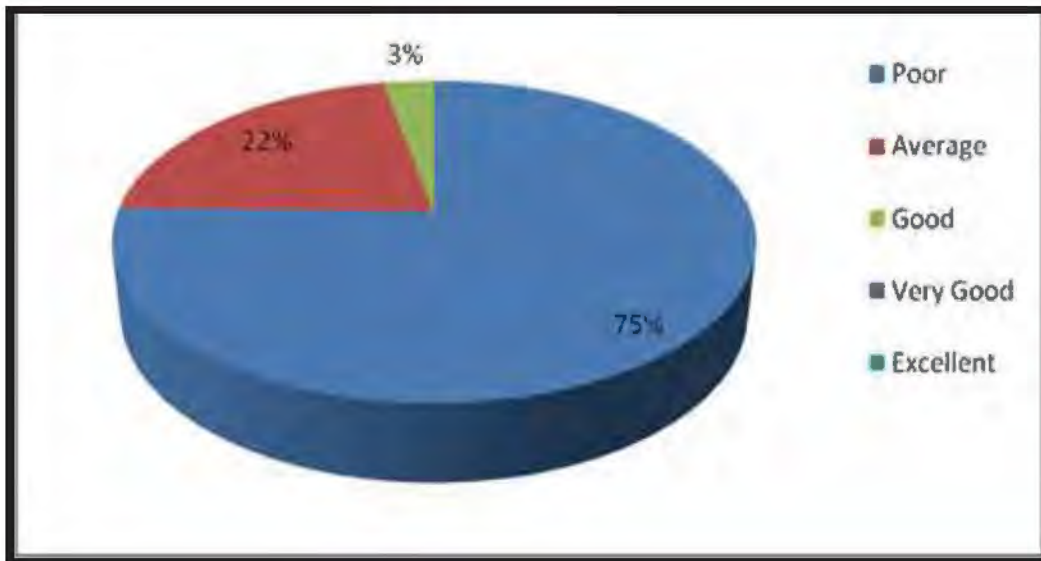
Sl No.	CSR Villages	Rating of Sports Facilities				
		1	2	3	4	5
1	Core Zone	33.33	33.33	33.33	-	-
2	Buffer Zone I	65.22	34.78	-	-	-
3	Buffer Zone II	84.62	12.82	2.56	-	-
<b>Overall</b>		<b>75.38</b>	<b>21.54</b>	<b>3.08</b>	-	-

Rank: 1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent

**FIGURE 6.22: CSR ZONE-WISE EVALUATION OF EXISTING SPORTS FACILITIES**



**FIGURE 6.23: EVALUATION OF EXISTING SPORTS FACILITIES IN CSR VILLAGES**



## 6.7 ASSESSMENT OF MAGNITUDE OF IMPACT OF CSR ACTIVITIES

The assessment of magnitude of impact of any programme based on any single variable or factor is highly limited. Accordingly, to assess the actual impact of CSR activities on individual beneficiary oriented programmes and community beneficiary oriented CSR activities, executed by the AF-REGL since 2015-16 to 2019-20, a number of variables have been evaluated. To assess the individual beneficiary oriented programmes in a significant manner, eight variables were studied (Table 6.13), while the assessment of the impact of the community beneficiary oriented CSR activities were based on seven variables (Table 6.14). The responses/perception of selected beneficiaries on all these variables, collected during the interview of the beneficiaries were taken for the assessment of magnitude of impact of CSR activities. The subsequent section highlights the actual impact of the CSR activities. The beneficiaries were classified into different economic sections on their score on the seven variables as mentioned below:

- Occupations of the beneficiaries
- Annual income of the beneficiaries
- Availability of basic facilities
- Type of houses
- Land ownership of the beneficiaries
- Indebtedness among beneficiary households
- Assets holding

The economic index helps to understand the actual impact especially individual beneficiary-oriented programmes on different economic sections of the village community.

**TABLE 6.13: VARIABLES FOR INDIVIDUAL BENEFICIARIES ORIENTED PROGRAMMES**

<i>Variables</i>	<i>Methodology</i>
Willingness to obtain benefits	Given high score to higher extent of willingness to obtain benefits (Very High-4, High-3, Low-2, Very Low-1, Nothing-0)
Extent to which benefits were received	Given high score to higher extent of benefits received (Very High-4, High-3, Low-2, Very Low-1, Nothing-0)
Change in living condition of beneficiaries	Given high score for high level of positive change (Given 1 score to each change)



<i>Variables</i>	<i>Methodology</i>
Direct or indirect benefits received from the programme	Given high score for high level of positive change (Given 1 score to each change)
Expectation level of people regarding future benefit by the programme	Given high score to high expectation level for future benefit (Very High-4, High-3, Low-2, Very Low-1, Nothing-0)
Social change with execution of CSR activities	Given high score to higher level of social changes (Very High-5, High-4, Moderate-3, Low-2, Very Low-1, No change-0)
Economic changes with execution of CSR activities	Given high score to higher level of economic changes (Very High-5, High-4, Moderate-3, Low-2, Very Low-1, No change-0)
Cultural changes with execution of CSR activities	Given high score to higher level of cultural changes (Very High-5, High-4, Moderate-3, Low-2, Very Low-1, No change-0)

**TABLE 6.14: VARIABLES FOR COMMUNITY BENEFICIARY ORIENTED DEVELOPMENT PROGRAMMES**

<b>Name of Variables</b>	<b>Methods</b>
Availability of roads	Given high score to high changes (Some improvement-1, High improvement-2, Very High improvement-3)
Constructions of community building	Given high score to high changes (Some improvement-1, High improvement-2, Very High improvement-3)
Safe drinking water	Given high score to high changes (Some improvement-1, High improvement-2, Very High improvement-3)
Ground water level	Given high score to high changes (Some improvement-1, High improvement-2, Very High improvement-3)
Sanitation facilities	Given high score to high changes (Some improvement-1, High improvement-2, Very High improvement-3)

Name of Variables	Methods
Infrastructural resources for education	Given high score to higher level of changes (Some improvement-1, High improvement-2, Very High improvement-3)
Infrastructural resources for health	Given high score to higher level of changes (Some improvement-1, High improvement-2, Very High improvement-3)

### 6.7.1 Status of Beneficiaries of Different Economic Categories

Barring few beneficiary households belonging to 'very low' economic category, approx. 55% of the beneficiaries belonged to the 'low' economic category. The second economic category was that of the 'moderate status' with approx. 35% households in this category. Whereas, approx. 10% belonged to 'high' or 'very high' economic category. The distribution of economic categories across various caste groups reveals that the low economic group was a majority in all the caste categories in varying degrees. Against 70 and 65% low economic category households in the SC and Minority groups respectively, the proportion for the OBC and general caste were 45 and 35% respectively. Among the OBC and General caste beneficiary households, 30 and 25% were in the moderate economic group respectively. The 'very high' economic category comprised of less than 5% of beneficiary households from the general caste.

Distribution of beneficiaries across different economic groups shows that the low and moderate income groups took maximum benefits of the CSR programmes. The further distribution of the beneficiaries across various programmes shows majority of skill development training, scholarship, medical aid were provided to 'low' economic category. This distribution of beneficiaries across different economic categories justifies the selection criteria of the beneficiaries. Similarly, majority of the beneficiaries of computer training programme, tailoring and beneficiaries of aid to physically challenged were from the moderate economic class. However, very few beneficiaries belong to very high economic category taking benefit of medical aid and improved agricultural practice/water conservation/dairy farming.

### 6.7.2 Impact of Individual Beneficiary Orientated Programmes

In terms of impact on the adopted CSR villagers i.e. Chote Bhandar, Bade Bhandar, Sarvani and Amlipali with significant beneficiaries selected, most of them opined that the CSR activities have had 'very high' to 'high' impact on their living conditions. The buffer zone-I & II villages Amlipali, Taprda, Jeveridih, Kotmera, Semra, Kathli, Bunga and Kalma, etc with number of beneficiaries also opined that programmes have had 'high' to 'moderate' impact. However the buffer zone-II villages i.e. Semibhwar, Raibar, Siha, Gotama, Kotasura, Lankapali, Bardoli and

Nandeli, etc were ranked lowest as few beneficiaries of these villages opined that the CSR activities have had 'moderate' to 'low' impact in the village.

### 6.7.3 Qualitative Observation Regarding Impact of CSR Activities

The AF-REGL undertook CSR activities under two heads, one being the individual beneficiary oriented programmes and other being community beneficiary oriented programmes. Under the individual beneficiary oriented schemes like providing scholarships, free education, skill development training, computer training, medical surgery, family planning, provision of tri-cycle, special shoes and hearing aids for handicapped were given. With the provision of scholarship, free education and aids for handicapped, there has been a rise in the sense of solidarity and self-dependence among the beneficiaries. Skill development training for women and girls has helped in capacitating them with skills and opened avenues for earning opportunities. Many of these women and girls have now opened up their business at home which is providing additional income to support their family besides economically empowering them. ASDC and other training has helped several beneficiaries to make self-reliant. The skill development training has made remarkable impact in terms of providing greater job opportunities especially to vulnerable group of people. The significant number of women in adjacent villages are motivated to scale up their business of mushroom cultivation, poultry farming, tailoring & garment manufacturing. The adoption of SRI technique for paddy cultivation along with livestock development and vermicomposting has increased crop yield significantly in the REGL-CSR zone. The beneficiaries of free surgery/operation support have now been able to resume their household responsibilities. The AF-REGL through promotion of female sterilization has been able to encourage small family potential benefits to local people.

Some of the benefits provided by the AF-REGL for any particular village were also availed directly or indirectly by other villagers. Deepening of pond and streams and bus shelters for passengers have proved to be useful not only for the residents of the particular village, but also for all the other villagers who access these facilities. The problems of villagers with regard to water logging and swampy filthy areas have been solved with construction of drains at various villages. With construction of school buildings/classroom and better sanitation facilities including development of playground, the expected results have been achieved to enhance the learning ambience in the educational institutions. With building up of school boundaries, safety of children in the school has enhanced. With the commencement and subsequent strengthening of health services in almost all the CSR villages, the health status of local people has improved significantly. With maintenance and renovation of schools and cleaning of drains, there has been a positive impact on the atmosphere of the villages.

The AF-REGL has done commendable work in ensuring the provision of clean potable drinking water to villagers. In several adjoining villages, Bore well and water tank have been installed and being maintained by local people effectively. This has helped in solving the problem of shortage of water availability to great extent.

Besides the regular mobile health care unit services to various CSR villages, every year the AF-REGL also conducts various health camps in different villages where people from the nearby villages also come to get free medical check-up. In these camps medical check-ups and advice or consultation by specialized doctors is provided. Seasonal ailments are treated and free medicines are distributed. Patients suffering from serious ailments are either sent to REGL hospital or are referred to other hospitals. Such camps have had positive impact on the lives of the people who are now not only relieved of seasonal diseases but are also diagnosed for complicated ailments.

The live-stock development centres have been setup for improving the status of live-stock. From time to time health camps for livestock are also organized wherein villagers from the concerned villages as well as nearby villages come for free medical treatment and advice. Apart from free medical check-ups and medicines, other facilities like artificial insemination methods and vaccines are also provided. With these camps being organized from time to time, the livestock mortality rates have gone down.

Sports competitions are also conducted/sponsored by AF-REGL regularly at various villages/town. Football, Volleyball, Kabaddi, Cricket, race, high jump, short puts throw and several other games are organized. The AF-REGL bears the expenses of providing players uniforms, conveyance charges, food, etc. The winners are given medals and trophies. These tournaments have very positive impact on the local youths interested in games and sports. This not only enhances their interest in games and sports but also gives them recognition. Apart from this, AF-REGL has provided computer, chairs, tables, sittings mats and games and sports appliances for schools. All the activities conducted in the selected villages under CSR were need-based and have had positive impact on the lives of the people.

## 6.8 ALLOCATION OF FUNDS

In accordance with its mission of being socially responsible corporate entity with thrust on community development, REGL aims to focus on implementing community development and engagement programs in the affected/ neighboring villages around its TPP. To accomplish this mission, a survey has been conducted to identify the social, economic and cultural needs of the villages falling within the 10 km radius of TPP, societies that can facilitate in formulating a comprehensive long-term development programme, to be undertaken under Corporate Social Responsibilities (CSR) activities. The whole exercise aims to set long-term priorities for CSR activities, which could be achieved within the specified time frame. Generally, the needs that are

rated most important are the ones that get addressed on priority. In this connection, a comprehensive plan has been chalked out delineating a budget allocation as per CSR policy of APL.

## 6.9 INSTITUTIONAL ARRANGEMENT

A Corporate Social Responsibility Committee (CSRC) is being re-constituted at the REGL for identification and implementation of activities which involve the followings:-

- To interact with the concerned State Government Officials to confirm the areas for undertaking activities under CSR and ensure to avoid duplicity of the job.
- To decide the priority of the activities to be undertaken under CSR.
- To interact with the NGOs for determining the activities to be undertaken.
- Based on the total activities to be undertaken the Committee recommends the quantum of budget for the year.
- Utilisation Certificate with statement of expenditure duly certified by an Authorised Auditor need to be submitted by the Organisation/ Institution to whom CSR fund is allocated.
- To monitor and review the progress of activities undertaken/completed.

The committee has been constituted with the representation from all parts of the local community, headed by Vice President (P&IR) and in every 6 (six) months Managing Director of APL reviews the CSR activities.

Assistance of NGOs is being sought, as and when necessary, for preparation of baseline data, action plans and involvement of the local communities. For this purpose, only NGOs of national repute or with a good track record are being involved.

## 6.10 UPKEEP AND MAINTENANCE OF ASSETS CREATED

Maintenance of Assets created under CSR is the Responsibility of the concerned State Government and local representative of the Society. Before any Capital investment is made, an undertaking is being taken from the representatives of local community that they are responsible for maintenance of the Assets.

## 6.11 REFLECTION OF CSR ACTIVITIES

Annual audit of all activities undertaken by the company is being done by local Authorized auditor. The CSR activities are reflected in the Annual Report and Accounts of APL under Social Overhead (CSR).

## 7.0 SOCIAL AUDIT IMPACT MATRIX

### 7.1 SOCIAL AUDIT FRAMEWORK

Social Audit team applied tools to gather first hand response from the stakeholders including the implementing staff from the REGL-AF. The findings are classified in the 4 thrust areas –Education (Quality Improvement, Infrastructure supplementation, HR Support); Community Health and Sanitation (Preventive and Curative measures); Sustainable Livelihoods Development (Youth, Farmers, Women and Groups); Rural Infrastructure Development (Improvement of availability of basic amenities). In each of the segments selected sample units were considered to study the programme design, implementation approach, reception and impact among the beneficiaries. These sample units are quantitatively and qualitatively assessed as per the scheme of social audit as elaborated in earlier chapters.

Social audit system applies certain base indicators which are chosen after the preliminary study of intent and content of any programme. Accordingly following indicators framework applied for the present study:

<b>Fundamental Factors and Programme Design</b>	Overall Common Factors -I (POLICY)
	Overall Common Factors-II (PROCESS)
<b>Programme Component-Community Health</b>	Programme Specific Factors (COMMUNITY HEALTH AND SANITATION)
	Sample Activity Health : Mobile Healthcare Unit (MHCU)
	Sample Activity Health : Support to Physically Challenged People
	Sample Activity Health : Health Camp & Hand washing campaign
<b>Programme Component-Education</b>	Programme Specific Factors (EDUCATION)
	Sample Activity Education- Project Uthhan
	Sample Activity Education- Coaching class for competitive examination
<b>Programme Component-Sustainable Livelihoods</b>	Sample Activity Education- Promotion of Sport & Games
	Programme Specific Factors (SUSTAINABLE LIVELIHOODS)
	Sample Observation Sustainable Livelihoods : Skill Development Training
	Sample Observation Sustainable Livelihoods : Formation & Development of SHGs
<b>Programme Component-Sustainable Livelihoods</b>	Sample Observation Sustainable Livelihoods : Mushroom Cultivation Training

	Sample Observation Sustainable Livelihoods : Vegetable Cultivation Training
	Sample Observation Sustainable Livelihoods : Livestock Development
Programme Component- Rural Infrastructure	Programme Specific Factors (RURAL INFRASTRUCTURE)
	Sample Activity Rural Infrastructure- Construction of Community Center
	Sample Activity Rural Infrastructure- Construction of Flood Relief Center
	Sample Activity Rural Infrastructure- Development of School Infrastructure
	Sample Activity Rural Infrastructure- Construction of Fence

## 7.2 SOCIAL AUDIT IMPACT MATRIX

The present social audit conducted for CSR activities undertaken during 2020-21 to 2022-23 on the basis of above mentioned framework. The impact assessment matrix along with analysis and finding for selected 28 indicators are presented in subsequent sections.

### 7.2.1 Fundamental CSR Factors & Programme Design

The impact assessment matrix for fundamental CSR factors and CSR schemes/programme design are presented in subsequent tables:



**Social Audit Constituent - 1 : Applied Weight = 5X**

**Overall Common Factors -I (Foundation's Mandate on CSR Policy)**

**30**

					-3	-2	-1	0	1	2	3	
1.1	Expertise of CSR implementing body	No	Partly	Yes							X	3
1.2	CSR Policy in place	No	Partly	Yes							X	3
1.3	Functional freedom to the CSR implementing body	NO	Low	High							X	3
1.4	CSR staff expertise in the sector	None	Partly	All							X	3
1.5	CSR wing leadership	Poor	Average	Good							X	3
1.6	CSR HR Policy in place and known to staff	No	Partly	Yes							X	3
1.7	Inclusion of Health	No	Partly	Yes						X		2
1.8	Inclusion of Education	No	Partly	Yes						X		2
1.9	Inclusion of Livelihood	No	Partly	Yes							X	3
1.10	Inclusion of Rural Infrastructure	No	Partly	Yes							X	3

SA Lead Auditor	REGL-AF Representative	SUM	AVERAGE/3	SA WEIGHT/500
		28	2.8	466.66

**Social Audit Constituent - 2 : Applied weight = 5X**

**Overall Common Factors -II (Foundation's Mandate on CSR Process)**

30

					-3	-2	-1	0	1	2	3	
2.1	Training to staff / volunteer	No	Partly	Yes						X		2
2.2	SOP available for activities	None	Some	All						X		2
2.3	Stakeholder Integration before rollout	NO	Low	High						X		2
2.4	Socio Economic Study of PAVs preactivity	None	Few	All							X	3
2.5	Measurable Indicator Assessed	No	Some	Yes							X	3
2.6	Integration with District level statebodies	None	Few	All							X	3
2.7	Integration with PRI representatives	No	Partly	Yes							X	3
2.8	Visible attention to Marginalized Communities	No	Partly	Yes							X	3
2.9	Gender Sensetive Process Design	No	Partly	Yes							X	3
2.10	Defined Stakeholder Grievance Redressal System	No	Partly	Yes						X		2

SA Lead Auditor	REGL-AF Representative	SUM		AVERAGE/3		SA WEIGHT/500	
		26		2.6		433	

**Social Audit Constituent - 3 : Applied weight = 4X**

**Programme Common Factors (CSR Programme/Schemes)**

36

					-3	-2	-1	0	1	2	3	
3.1	Structured Community Need Assessment	No	Partly	Yes						X		2
3.2	CAN participated by stakeholder	No	Partly	Yes						X		2
3.3	Gap Addressing Procedure followed	NO	Partly	Yes						X		2
3.4	Qualitative Indicators in place	None	Some	All							X	3
3.5	Qualitative input Indicators in place	No	Partly	Yes							X	3
3.6	Quantitative outcome indicators in place	No	Partly	Yes						X		2
3.7	Community Need Relevance against Wants	No	Partly	Yes						X		2
3.8	Sustainability Checks exercised	No	Partly	Yes						X		2
3.9	Internal Resource Optimization in CSR	No	Partly	Yes							X	3
3.10	Community Monitoring System in place	No	Partly	Yes						X		2
3.11	Result Based Programme Management	No	Partly	Yes						X		2
3.12	Staff Motivation Level	No	Average	Yes							X	3

SA Lead Auditor	REGL-AF Representative	SUM		AVERAGE/3		SA WEIGHT/400	
		28		2.33		311.11	

**Social Audit Constituent - 4 : Applied weight = 5X**

**Programme Specific Factors (Community Health)**

30

					-3	-2	-1	0	1	2	3	
5.1	Staff/External expertise trained in relevant skill sets	No	Partly	Yes							X	3
5.2	Covers mother and child health issues	No	Partly	Yes						X		2
5.3	Availability of essential medicines	None	Some	All							X	3
5.4	Equipments available and functioning	No	Partly	Yes							X	3
5.5	Impact of Door Step Services	<40%	<60%	>60%							X	3
5.6	Integration with NRHM/ANM /Mitanin	No	Partly	High							X	3
5.7	Follow up mechanism in place at dispensaries	No	Partly	Yes						X		2
5.8	Access to Health Services by MMU	No	Partly	Yes							X	3
5.9	Preparedness to handle epidemic conditions	No	Partly	Yes						X		2
5.10	Focus Programme on Women Health Issues	No	Partly	Yes							X	3

SA Lead Auditor	REL-AF Representative	SUM		AVERAGE/3		SA WEIGHT/500	
		27		2.7		450	

**Social Audit Constituent - 5 : Applied weight = 3.5X**

**Programme Specific Factors (Education)**

24

					-3	-2	-1	0	1	2	3	
4.1	Change in Perception & Significance of Education	Decr	Neutr	Incr							X	3
4.2	Change in Learning Inclination	Decr	Neutr	Incr							X	3
4.3	Change in Female drop out in higher classes	Incr	Neutr	Decr							X	3
4.4	Change in Educator's HR Quality in select schools	No	Partly	Yes							X	3
4.5	Follow up mechanism in place	No	Partly	Yes						X		2
4.6	Infra support meets the needs	Below	Matches	Above							X	3
4.7	Efforts made to train the teachers	No	Partly	Yes							X	3
4.8	Integration with Anganwadi	Nil	Partly	High							X	3

SA Lead Auditor	REGL-AF Representative	SUM	AVERAGE/3	SA WEIGHT/350
		23	2.8	335.41

**Social Audit Constituent - 6 : Applied weight = 5X**

**Programme Specific Factors (Sustainable Livelihoods)**

27

					-3	-2	-1	0	1	2	3	
6.1	SHG Federation against expected performance	Below	Matches	Above							X	3
6.2	SDTC's Dynamic Response to Employability Training	Poor	Avg	Good							X	3
6.3	Banking Linkages	Decr	Neutr	Incr						X		2
6.4	Inclusion of Marginalized Communities	No	Partly	Yes							X	3
6.5	SHGs Operational Performance Abilities	Decr	Neutr	Incr							X	3
6.6	Change in level of income	0	30%+	50%+							X	3
6.7	Integration with NRLM and other agencies	No	Partly	Yes						X		2
6.8	Productivity / Employability Preparedness	No	Approx	Yes							X	3
6.9	Feedback is used in planning	No	Partly	Yes							X	3

SA Lead Auditor	REGL-AF Representative	SUM	AVERAGE/3	SA WEIGHT/500
		25	2.7	462.96

**Social Audit Constituent - 7 : Applied weight = 2.5X****Programme Specific Factors (Rural Infrastructure)**

24

					-3	-2	-1	0	1	2	3	
4.1	Change in Perception & Significance of Basic Amenities	Decr	Neutr	Incr						X		2
4.2	Change in Availability of Basic Amenities	Decr	Neutr	Incr						X		2
4.3	Change in Quality of Life of People	Incr	Neutr	Decr						X		2
4.4	Change in Quality in select infrastructure	No	Partly	Yes						X		2
4.5	Follow up mechanism for maintance in place	No	Partly	Yes						X		2
4.6	Infra support meets the needs	Below	Matches	Above						X		2
4.7	Efforts made to improve infrastructure	No	Partly	Yes						X		2
4.8	Integration with Government Programm	Nil	Partly	High						X		2

SA Lead Auditor	REGL-AF Representative	SUM	AVERAGE/3	SA WEIGHT/250
		16	2	200

**Findings**

Overall, the CSR Policy & Process are in line with the mandate. The components are getting aligned in a better and effective manner. The programme design is sound enough to render a sustainable growth. However, it was realized that the interpretation of programme design at the implementation level need to be further strengthen.

**Cherish**

1. Understanding of local needs and dynamics infused into the present CSR programme designs.
2. Proactive compliance and strategic implementation of Sec. 135 , Schedule 7 provisions.
3. Functional parameters set informally within the team and volunteers.
4. Gender Sensitive Process Designs.

5. Sustainability Anchors in Programme Design.

**Focus**

1. Foundation's Value System and its functional presence in group dynamics.
2. Community Connect in the Programme Communication Strategy

**7.2.2 Health & Sanitation Programmes**

The impact assessment matrix for Health and Sanitation Programmes are presented in subsequent tables:

**SA Constituent: 8**

**HEALTH : Mobile Health Care Unit (MHCU)**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2.5						X	
Delivery Process	2.5						X	
Beneficiary Ownership	3							X
Outcome Reflection	3							X
Value Proposition	3							X
Gender Inclusion	3							X
<b>Total out of 18</b>	<b>17</b>							
<b>Average</b>	<b>2.83</b>							
<b>Score</b>	<b>1133.33</b>							

**Out of 1200**      Weight: 12X



**HEALTH : Support to Physically Challenged People**

**SA Constituent: 9**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2.5						X	
Delivery Process	2.5						X	
Beneficiary Ownership	3							X
Outcome Reflection	2.5						X	
Value Proposition	2.5						X	
Gender Inclusion	3							X
<b>Total out of 18</b>	<b>16</b>							
<b>Average</b>	<b>2.66</b>							
<b>Score</b>	<b>133.33</b>	<b>Out of 150</b>		<b>Weight: 1.5X</b>				

**SA Constituent: 10**

**HEALTH : Health Camp & Hand washing campaign**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2						X	
Delivery Process	1.5					X		
Beneficiary Ownership	3							X
Outcome Reflection	2					X		
Value Proposition	2						X	
Gender Inclusion	3							X
<b>Total out of 18</b>	<b>13.5</b>							
<b>Average</b>	<b>2.25</b>							
<b>Score</b>	<b>112.5</b>	<b>Out of 150</b>		<b>Weight: 1.5X</b>				

**Findings:**

Health Care interventions have been very significantly placed in the CSR activities during the reporting period. In compliance with state government's order to prevent practices of unauthorized medical prescription and drug administration the services of health volunteers at village Mobile Health Care Units (MHCUs) have been redesigned. Now the medicines are only

prescribed by authorized doctors and medical team. MHCUs are providing a stable presence whereas Nutrition Care, Eye Camp, School Health Awareness Drive, ANC and Annaprashan, Women Hygiene Awareness kind of activities are creating a positive environment for the general health care among the people. Hand washing campaigns in schools to raise awareness among students is a good value addition in the sanitation drive.

**Cherish:**

1. Providing doorstep healthcare services to local community
2. Extending support to physically challenged people
3. Regular awareness drive among people regarding health and sanitation

**Focus:**

1. Doorstep healthcare services have emerged as the face of Health component under the CSR. There is a perception difference between what MHCUs can offer and what people expect out of it. It is requested that a Perception Communication Strategy be devised for this issue.
2. Foundation needs to give more emphasis to engage its resources in sanitation drive. This will not only create better sanitation standards but will also supplement the sector where state bodies have their functional limitations.
3. Eye screening and health camps to extend support to physically challenged people was a good initiative. It is suggested that based on the inputs earned during the activity a fresh component dedicated on well-being of physically challenged people could be designed.
4. School Health and Hygiene Awareness sessions are doing well and they have a lot of untapped potential. One such input could be to use the students' strength as sound board for preventive community health and nutrition components.
5. PRI members, teachers and other village representatives, during the discussion, found technically less aware and inclined for the holistic approach of Swachh Bharat Abhiyan, that is holistic sanitation and hygiene. This area can be addressed through the foundation by initiating a linear approach for holistic sanitation at household and at community levels.

### 7.2.3 Education Programmes

The impact assessment matrix for Education Programmes are presented in subsequent tables:

#### SA Constituent: 11

#### EDUCATION : Placement of Community Teachers

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	3							X
Delivery Process	2.5						X	
Beneficiary Ownership	3							X
Outcome Reflection	3							X
Value Proposition	2.5						X	
Gender Inclusion	3							X
<b>Total out of 18</b>	<b>17</b>							
<b>Average</b>	<b>2.83</b>							
<b>Score</b>	<b>283.33</b>	<b>Out of 300</b>		<b>Weight: 3X</b>				

#### SA Constituent: 12

#### EDUCATION : Activity Based Learning

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2.5						X	
Delivery Process	3							X
Beneficiary Ownership	3							X
Outcome Reflection	2.5						X	
Value Proposition	2.5						X	
Gender Inclusion	3							X
<b>Total out of 18</b>	<b>16.5</b>							
<b>Average</b>	<b>2.75</b>							
<b>Score</b>	<b>275</b>	<b>Out of 300</b>		<b>Weight: 3X</b>				

**SA Constituent: 13**

**EDUCATION : Teaching Aids Support**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2.5						X	
Delivery Process	2.5						X	
Beneficiary Ownership	3							X
Outcome Reflection	2.5						X	
Value Proposition	2.5						X	
<b>Total out of 15</b>	<b>13</b>							
<b>Average</b>	<b>2.6</b>							
<b>Score</b>	<b>260</b>	<b>Out of 300</b>	<b>Weight: 3X</b>					

**SA Constituent: 14**

**EDUCATION : Coaching class for competitive examination**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	3							X
Delivery Process	3							X
Beneficiary Ownership	3							X
Outcome Reflection	2.5					X		
Value Proposition	3							X
Gender Inclusion	3							X
<b>Total out of 18</b>	<b>17.5</b>							
<b>Average</b>	<b>2.91</b>							
<b>Score</b>	<b>291.66</b>	<b>Out of 300</b>	<b>Weight: 3X</b>					

**SA Constituent: 15****EDUCATION : Promotion of Sport & Games**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	3							X
Delivery Process	3							X
Beneficiary Ownership	3							X
Outcome Reflection	2.5						X	
Value Proposition	2						X	
Gender Inclusion	2.5						X	
<b>Total out of 18</b>	<b>16</b>							
<b>Average</b>	<b>2.66</b>							
<b>Score</b>	<b>266.66</b>	<b>Out of 300</b>		<b>Weight: 3X</b>				

**Findings:**

Education as a CSR component has been one of the very strong hold areas of inputs and an anchor of community perception ever since the days of inception with entry level CSR. Uthhan project is being implemented in 5 primary schools and 3 middle schools. The program is aimed at reducing the dropout rate from schools and covers Initiatives like Activity based learning, science education programme, teaching aid support to engage parents and students actively in the learning process. Along with these, organization of coaching classes to help students prepare better for competitive examinations and promotion of sports and game have earned good repute and a high social return on investment. In the current reporting period too, it was quite evident that nothing connects with the community better and deeper than the education component under CSR. These are the areas where outputs reach to impact. After a deep thought and discussion with all stakeholders it was concluded that the program needs to be implemented across a wider area.

**Cherish:**

1. The experiential learning generated by the salary contributed teachers' segment. Their ideas that they shared during the social audit makes us believe in their integrity and commitment. This lot of teachers is in deep contrast with rest of the teachers in the PAVs. Their skills can be applied for inducting similar results in other schools as well.
2. Placement of Community Teachers and indirect support to schools.
3. Infrastructure support to schools. The school campuses in most of the schools at PAVs are

very plane and barren. Plantation will not only improve the micro local environment but will also instill good values for environment conservation among students. This can also be clubbed with state component of School Eco Clubs.

4. The overall development approach adopted with promotion of sport and games.

**Focus:**

1. The most important and yet very under addressed area is Capacity and Behaviour Modeling of Teaching Staff - Pedagogy, Use of Learning Aid, Ability to sort and address learning level differences , Psychometric Abilities, Reinforcement of Knowledge, Stress Management, Ability to Assess and record , Reporting , Updating self-awareness level.
2. HR Strengthening at the Programme Staff level for education. It has multiple hands to handle it. This needs to be addressed in light of the opportunities science learning can crack with right approach.
3. Community teachers need to extend their support to the regular teachers with the workload and some different teaching inputs

**7.2.4 Sustainable Livelihood Development Programmes**

The impact assessment matrix for Sustainable Livelihood Development Programmes are presented in subsequent tables:

**SA Constituent: 16**

**SUSTAINABLE LIVELIHOODS:  
Skill Development Training**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	3							X
Delivery Process	3							X
Beneficiary Ownership	2.5						X	
Outcome Reflection	3							X
Value Preposition	2.5						X	
Gender Inclusion	3							X
<b>Total out of 18</b>	<b>17</b>							
<b>Average</b>	<b>2.83</b>							
<b>Score</b>	<b>472.22</b>	<b>Out of 500</b>		<b>Weight: 5X</b>				



**SUSTAINABLE LIVELIHOODS : Formation & Development of SHGs**

**SA Constituent: 17**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	3							X
Delivery Process	2.5						X	
Beneficiary Ownership	3							X
Outcome Reflection	3							X
Value Preposition	2						X	
Gender Inclusion	2.5						X	
<b>Total out of 18</b>	<b>16</b>							
<b>Average</b>	<b>2.66</b>							
<b>Score</b>	<b>266.66</b>	<b>Out of 300</b>		<b>Weight: 3X</b>				

**SUSTAINABLE LIVELIHOODS : Mushroom Cultivation Training**

**SA Constituent: 18**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2.5						X	
Delivery Process	3							X
Beneficiary Ownership	3							X
Outcome Reflection	3							X
Value Preposition	2.5						X	
<b>Total out of 15</b>	<b>14</b>							
<b>Average</b>	<b>2.8</b>							
<b>Score</b>	<b>466.66</b>	<b>Out of 500</b>		<b>Weight: 5X</b>				

**SA Constituent: 19**

**SUSTAINABLE LIVELIHOODS :  
Vegetable Cultivation Training**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	3						X	
Delivery Process	3						X	
Beneficiary Ownership	3							X
Outcome Reflection	2						X	
Value Proposition	2						X	
<b>Total out of 15</b>	<b>13</b>							
<b>Average</b>	<b>2.6</b>							
<b>Score</b>	<b>346.66</b>	<b>Out of 400</b>	<b>Weight: 4X</b>					

**SA Constituent: 20**

**SUSTAINABLE LIVELIHOODS :  
Livestock Development**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2.5						X	
Delivery Process	2.5						X	
Beneficiary Ownership	3							X
Outcome Reflection	2.5						X	
Value Proposition	2.5						X	
<b>Total out of 15</b>	<b>13</b>							
<b>Average</b>	<b>2.6</b>							
<b>Score</b>	<b>260</b>	<b>Out of 300</b>	<b>Weight: 3X</b>					

**Findings:**

This is the star performer segment in the reporting period. However the Sustainable Alternative Livelihoods development segment also faces challenges, conflicts more than any other segment. But the beauty of journey has been the way the programme level staff and the volunteers have evolved through each such experience. Skill Development Training Centre has become more out stretched and functional. The small partnerships with various local organizations fuel in a high value to the segment. The settlement ratio is also high and satisfactory. There are suggestions



for improvement but for all good reasons and because of the strength this team exhibits. SHGs are doing well in their own limited definitions and lot of efforts from the leadership level has been the source of motivation for the SHGs to perform better in near future. Mushroom cultivation has emerged as a powerful tool for the livelihood promotion. At present, 23 SHGs are involved in the mushroom cultivation program. Women from tribal and other poor families organized to serve the growing need of the area. The initial support for capacity building, shed, feed, spawn, bags and market linkages are being provided. All program participants are brought together to form cooperative. Backward and forward market linkages has been established. Mushroom Production promoted through SHGs with the women members in the villages as farm-based enterprises. The activity is low cost, less labour intensive and has ample market potential. Vegetable cultivation is another area that has emerged recently and is being supported by the Foundation to support SHGs cultivate fruits and vegetables through the application of various efficient and sustainable agricultural practices. Initiatives associated with livestock development for the betterment of farmers and livestock has also yielded good result.

**Cherish:**

1. Vocational Training Centres and their functional approach of evolving with every challenge.
2. SHGs linkage with different organizations.
3. Advanced Tailoring Training cum Production Centre
4. Providing doorstep medical services for livestock development

**Focus:**

1. The trainers at VDC now need some upgradation in terms of managerial skills, pedagogy, documentation, entrepreneurship development, backward / forward linkages and follow up. VTC in its present approach is doing good but it now needs to converge into a training and entrepreneurship centre, where there are possibilities of 3 vital linkages for the trained youth – certification, finance and market.
2. The concept of local economy strengthening through CSR inputs can be taken up to effectively engage the component of IIGA and Family Income Support components.
3. Advanced Tailoring Training cum Production Centre is a big promising component. It can be the face changing activity not only for REGL-AF but for the entire CSR segment of the region. Foundation has established the best equipment and machines, but the programme level staff needs to prepare a market centric approach for the centre. The

centre must not be left to swing between being a training centre or a production unit. The balance needs to be found and maintained.

- The vegetable cultivation program has a lot of hidden potential in terms of bringing economic growth to the SHGs. Hence, the foundation needs to support and closely monitor the program in order to strengthen capacity of SHGs involved in the same.

### 7.2.5 Rural Infrastructure Development

The impact assessment matrix for Education Programmes are presented in subsequent tables:

#### SA Constituent: 21

#### Rural Infrastructure : Construction of Community Center

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2						X	
Delivery Process	2						X	
Beneficiary Ownership	2.5						X	
Outcome Reflection	2.5						X	
Value Proposition	2						X	
<b>Total out of 15</b>	<b>11</b>							
<b>Average</b>	<b>2.2</b>							
<b>Score</b>	<b>550</b>	<b>Out of 750</b>	Weight: 7.5X					

#### SA Constituent: 22

#### Rural Infrastructure : Construction of Flood Relief Center

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2						X	
Delivery Process	2						X	
Beneficiary Ownership	2.5						X	
Outcome Reflection	1.5					X		
Value Proposition	2						X	
<b>Total out of 15</b>	<b>10</b>							
<b>Average</b>	<b>2</b>							
<b>Score</b>	<b>466.66</b>	<b>Out of 700</b>	Weight: 7X					

**SA Constituent: 23**

**Rural Infrastructure :  
Construction of Fence**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	2						X	
Delivery Process	2						X	
Beneficiary Ownership	2						X	
Outcome Reflection	2						X	
Value Proposition	2.5						X	
<b>Total out of 15</b>	<b>10.5</b>							
<b>Average</b>	<b>2.1</b>							
<b>Score</b>	<b>210</b>	<b>Out of 300</b>	Weight: 3X					

**SA Constituent: 24**

**Rural Infrastructure:  
Development of School  
Infrastructure**

SA Parameters	Point Source	-3	-2	-1	0	1	2	3
Design Rationale	1.5					X		
Delivery Process	1.5					X		
Beneficiary Ownership	2.5						X	
Outcome Reflection	2						X	
Value Proposition	2						X	
<b>Total out of 15</b>	<b>12.5</b>							
<b>Average</b>	<b>2.5</b>							
<b>Score</b>	<b>208.33</b>	<b>Out of 250</b>	Weight: 2.5X					

**Findings:**

The increase in the level of rural infrastructure has two effects: promotion of economic growth and a decline in the incidence of absolute poverty. REGL believes that developing infrastructure is essential for sustaining and multiplying growth of the society. This is the one of the major segment of CSR activities in the reporting period. The rural infrastructure development faces very

high challenges as well as conflicts as compared to other thrust area of CSR activities. REGL-AF took up initiative to improve rural standard of living by constructing three community centers (1 completed and 2 under progress) which can help the local community to access the same for multiple uses. Fencing activity was recently completed in one of the villages as per request. AF-REGL is involved in construction of a flood relief center at present that can be used by people as shelter during emergency and as a community center during the rest of the year. A water purifier was recently installed in a school to make safe drinking water easily available to students.

**Cherish:**

5. Improve overall rural standard of living.
6. Mitigation measures for emergency situations.
7. Increased availability of Safe Drinking water.
8. Effective social and cultural integration of community

**Focus:**

5. The need based approach while planning and execution of rural infrastructure activities to increase the usage pattern and effective maintenance of the same to be adopted.
6. Community based repairing and maintenance system to be evolved.
7. More convergence with State as well as Central Government rural infrastructure development programme specially in area of school infrastructure support.

The brief summary impact assessment matrix of CSR Policy, Programmes and Activities during the present audit period is presented in subsequent tables:

#### Summary of Impact Matrix for CSR Policy, Process & Programme

Sl. No.	Description	Total Score	Score Obtained	% of Score
1	Overall Common Factors –I (POLICY)	500	466.66	93.33
2	Overall Common Factors-II (PROCESS)	500	433.00	86.60
3	Programme Common Factors (PROGRAMMES)	400	311.11	77.77
4	Programme Specific Factors (HEALTH AND SANITATION)	500	450.00	90.00
5	Programme Specific Factors (EDUCATION)	350	335.41	95.83
6	Programme Specific Factors (SUSTAINABLE LIVELIHOODS)	500	462.96	92.59
7	Programme Specific Factors (RURAL INFRASTRUCTURE)	250	200.00	91.66
<b>Grand Total</b>		<b>3000</b>	<b>2659.14</b>	<b>88.02</b>

#### Summary of Impact Matrix for CSR Activities Under Health and Sanitation Programme

Description	Total Score	Score Obtained	% of Score
Mobile Health Care Unit (MHCU)	1200	1133.33	94.44
Sample Activity Health: Support to Physically Challenged People	150	133.33	88.89
Sample Activity Health : Health camp & Hand Washing campaign	150	112.5	75.00
<b>Total</b>	<b>1500</b>	<b>1379.16</b>	<b>86.11</b>

**Summary of Impact Matrix for CSR Activities Under Education Programme**

Description	Total Score	Score Obtained	% of Score
Sample Activity Education-Placement of Community Teachers	300	283.33	94.44
Sample Activity Education-Activity Based Learning	300	275.00	91.67
Sample Activity Education- Teaching Aids Support	300	260.00	86.67
Sample Activity Education- Coaching class for competitive Examination	300	291.66	97.22
Sample Activity Education- Promotion of Sport & Games	300	266.66	88.89
<b>Total</b>	<b>1500</b>	<b>1376.65</b>	<b>91.78</b>

**Summary of Impact Matrix for CSR Activities Under Sustainable Livelihood Programme**

Description	Total Score	Score Obtained	% of Score
Sample Observation Sustainable Livelihoods : Skill Development Training	500	472.22	94.44
Sample Observation Sustainable Livelihoods : Formation & Development of SHGs	300	266.66	88.89
Sample Activity Sustainable Livelihoods : Mushroom Cultivation Training	500	466.66	93.33
Sample Activity Sustainable Livelihoods : Vegetable Cultivation Training	400	346.66	86.67
Sample Observation Sustainable Livelihoods : Livestock Development	300	260.00	86.67
<b>Total</b>	<b>2000</b>	<b>1812.2</b>	<b>90.00</b>

### Summary of Impact Matrix for CSR Activities Under Rural Infrastructure Development

Description	Total Score	Score Obtained	% of Score
Sample Activity Rural Infrastructure-Construction of Community Center	750	550.00	73.33
Sample Activity Rural Infrastructure-Construction of Flood Relief Center	700	466.66	66.66
Sample Activity Rural Infrastructure-Construction of Fence	300	210.00	70.00
Sample Activity Rural Infrastructure-Development of School Infrastructure	250	208.33	83.33
<b>Total</b>	<b>2000</b>	<b>1434.99</b>	<b>73.33</b>

CSR Activities are being implemented with a result based approach. Good indicators are being maintained. Community is satisfied. Quantitative Indicators exhibit a healthy level at 8662 of 10000 scale. Qualitative indicators meet satisfaction of the beneficiaries in the grade of 80% and above.

Since the SA point weight 8662.14 is in band 7500-10000 it is termed as – Sustainably Excellent. This indicates that the current position has the potential to improve, however it has gained basic strength to deliver. More value addition strategies need to be implied with the core approach in time to come. There is an increase of about 10 % against social audit impact score of 2019-20.

### Overall Summary of Impact Score Matrix for CSR Activities

Sl. No.	Description	Total Score	Score Obtained	% of Score
1	CSR Policy, Process & Programme	3000	2659.14	88.64
2	CSR Activities Under Health and Sanitation Programme	1500	1379.16	91.94
3	CSR Activities Under Education Programme	1500	1376.65	91.78
4	CSR Activities Under Sustainable Livelihood Programme	2000	1812.2	90.61
5	CSR Activities Under Rural Infrastructure Programme	2000	1434.99	71.75
	<b>Grand Total</b>	<b>10000</b>	<b>8662.14</b>	<b>86.94</b>



2022-23

# Annual Progress Report – REGL, Raigarh



4/1/2023



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## Preface

Raigarh Energy Generation Limited (REGL) erstwhile Korba West Power company Limited, a unit of Adani Power Limited (APL) is a 1X600 MW coal based thermal power plant. The plant is located at village- Chhote Bhandar, PO- Bade Bhandar, Tehsil- Pussore, District- Raigarh, Chhattisgarh. 15 KM from Pussore tehsil and 25 KM from Raigarh district headquarter. The plant is on the National Highway- 153 (erstwhile NH- 216), east end Raigarh and west end Sarangarh connecting to Raipur, the state capital. The nearest railhead is at Raigarh. The airport is at Jharsuguda 105 KM and Raipur airport is at 225 KM.

This is a green field power plant initiated in the year 2008 and commissioned in the year 2014. The total land acquired for the plant is 897 acres from the four villages of Pussore tehsil. The plant is out of the Abadi area, hence there is no displacement of the houses. The CSR initiatives in peripheral villages began along with the initiation of land acquisition in late 2008. During the project time CSR project and activities were spread over in 75 villages within 10 KM radius of the project.

In the year 2019, Adani Power Limited acquired erstwhile Korba West Power company Limited through Hon. NCLT, Ahmedabad and renamed Raigarh Energy Generation Limited (REGL).

With the enactment of the Companies Act, 2013 a broad framework of CSR has been provided in section 135, schedule VIII of the Act and CSR Rules effected from January 2014. Thereafter various amendments made in the CSR Rules. To this, the CSR policy of APL approved by the Board of Directors on 6th August 2014.

ADANI Foundation (AF) is the CSR arm of Adani Group of companies implementing CSR projects and activities at different locations in India focusing on Health, Education, Livelihood, Community Infrastructure Development, and Skill Development of the youths.

A MoU executed with AF on dated 22nd, December 2020 for implementation of CSR projects at REGL. AF is implementing various CSR projects in 15 peripheral villages including 4 core villages of plant since FY 2021-22 focusing on Health, Education, Sustainable Livelihood, Community Infrastructure Development, and Skill Development of the youths. The four core villages are Bade Bhandar, Chhote Bhandar, Amalibhouna and Sarwani.

This was the second year of CSR implementation from AF. All CSR initiatives were aligned with Sustainable Development Goals (SDGs). This year we took up many new initiatives like Adani Competitive Coaching Center, Utthan Project in 8 Govt. schools, Kabaddi Training for girls, Kamdhenu- Dairy Development Project in partnership with BAIF. 100 girls were trained in tailoring course, micro-entrepreneurial development with SHGs for mushroom and vegetable cultivation. Constructed Community center and shed at village Bade Bhandar and Kalma.

## Message from Business Head

It gives us great pleasure to present to you our annual CSR Report for the FY 2022-23. The report gives a comprehensive overview of our CSR interventions executed in the peripheral villages as a responsible corporate citizen. This was the second year of CSR project implementation from Adani Foundation after takeover of the plant. Social and Environmental responsibility has always been at the forefront of the Adani Power operating philosophy.



This year, our CSR team has undertaken various need-based new projects in line with Adani Power Limited (APL) CSR policy.

It gives us immense pleasure to know that the local women have formed Self Help Groups and are engaged in various farm, off-farm, and non-farm activities, and they are becoming self-reliant under our CSR sustainable livelihood development projects. Our Medical Healthcare Unit have brought medical facilities at the doorsteps of the communities.

We have launched three year's Kamdhenu-Dairy Development Project to be implemented by BAIF Institute for Sustainable Livelihoods and Development with an aim to improve productivity and additional source of income to the farmers from livestock. Under Education program, we took up our flagship Project Utthan and Adani Competitive Coaching Center.

I am proud to mention that our commitment towards welfare of the society continues whereby our team and associates actively participated in the "Go Red Drive" and voluntarily donated 289 units of blood for the noble cause. On the other hand, we are actively engaged in plantation of tree saplings for greener future.

I am confident that we will be able to make difference in the lives of the communities by improving their access to quality education, health care services, livelihood opportunities and improved infrastructure.

I would like to sincerely thank all our implementing agencies, NGOs, communities, stakeholders, advisors, district administration, employees, and colleagues for working towards the common goal. We will continue to reimagine our projects, seeking to find solutions that will have larger impacts, along with being scalable and replicable.

Going forward, we continue to stay committed to working towards education, skill development, employability, medical care, and the environment.

Best Wishes,

Samir Kumar Mitra  
Station Head



Raigarh district falls in northern region and eastern part of state bordering Odisha. The district is known for its rich natural resources and rivers Kelo, Mahandi and Mand, which flows through and across the district.



DEMOGRAPHIC INDICATORS	CHHATTISGARH	RAIGARH	PUSSORE	CSR INTERVENTION VILLAGES
Population	25545198	1493984	139799	14998
Male	12,832,895	750278	70261	7534
Female	12,712,303	743706	69538	7464
Schedule Caste	12.81%	15.06%	14.35%	17.74%
Schedule Tribe	15.16%	37.86%	20.58%	24.91%
Number of Households	5640620	367701	36644	3992
Total Villages	20335	1485	148	15
Total Panchayat	9770	774	88	10
Sex Ratio	991	991	990	991
Population Density	189	218	349	---
Literacy				
Total	71.04%	73.26%	70.48%	75.75%
Male	81.45%	83.49%	88.71%	86.87%
Female	60.59%	63.02%	70.26%	64.08%

#### CSR INTERVENTION VILLAGE WISE DEMOGRAPHIC PROFILE

SL	Name of Villages	No. of Household	ST	SC	Others	Village Population
1	Bade Bhandar	316	116	329	753	1198
2	Chhote Bhandar	166	58	28	479	565
3	Amlibhouna	149	0	532	45	577
4	Jevridih	107	197	42	186	425
5	Sarwani	133	25	384	51	460
6	Barpali	210	422	112	268	802
7	Kathli	152	61	24	524	609
8	Tupkadhar	51	13	10	180	203
9	Bunga	695	245	453	1962	2660
10	Ranbhatha	298	206	373	642	1221
11	Taparda	301	440	90	479	1009
12	Supa	465	668	278	839	1785
13	Kotmara	340	41	411	681	1133
14	Kalma	297	66	601	513	1180
15	Chandli	312	103	70	998	1171
	<b>Grand Total</b>	<b>3992</b>	<b>2661</b>	<b>3737</b>	<b>8600</b>	<b>14998</b>

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## Executive Summary

Year 2022-23 was the second year of CSR project implementation from Adani Foundation after takeover of the plant. The CSR projects were identified in consultation with the community and need of the area in alignment with Adani Power Limited CSR policy and Strategic Direction set by Hon. Chairperson Adani Foundation. Project Design Document developed (PDD) with the clear understanding on rationale for the project, goal and objectives, outcome indicators with project implementation timeline and budget.

The project implementation strategy was to ensure community participation and where possible coordinated with the govt. line departments for convergence to create greater impact. Digital Monitoring, Evaluation and Learning (DMEAL) were introduced and adopted by the field team for recording of activities and to further use for programmatic decisions.

CSR projects in the thematic area of Education, Health, Livelihood and Community Infrastructure Development were implemented in 15 peripheral villages including four core villages of the plant.

## Key Highlights

### 1. Education:

- Launched Project Utthan for providing enabling environment to 525 children for improving reading, writing and numeracy (Foundational literacy and numeracy) abilities from 8 govt. schools- 5 primary and 3 middle schools to achieve objectives of NIPUN Bharat Mission.
  - Placed four volunteers named Utthan Sahayak to facilitate the project activities in the schools,
  - BaLA (Building and Learning Aid) painting done in schools to stimulate curiosity among the children to learn and remember easily,
  - Organized and participated in Republic Day and Science Day in the schools,
  - Distributed sports items and music instruments in the schools as part of joyful learning.
- 35 economically poor youths are preparing for Govt job competitive examination free at **Adani Competitive Coaching Centre** run at Pussore tehsil in coordination with Education Department.
- **Adani Khel Kumbh**- Trained 30 girls for Kabaddi from qualified coaches to play at district and state level tournaments. Three girls selected to play at state level tournaments. Also sponsored youth clubs for Taekwondo, Kabaddi, and Cricket tournament.

### 2. Community Health:

- Mobile Healthcare Unit conducted 17191 free health check-ups and treatments through 655 camps at the doorsteps to the people residing in 15 peripheral villages.

- More than 1000 people received medical aid in the health camp organized during Navratri at Maa Chandrahasini temple, Chandrapur, Dabhra, Dist-Sakti.

### 3. Sustainable Livelihood Development:

#### *Adani's Mahila Movement for Advancement (AMMA)-*

- Extended support to 35 Self Help Groups (SHGs) for undertaking on-farm, off-farm, and non-farm activities to generate additional income
  - 15 SHGs earned Rs 1.30 lakhs from mushroom cultivation
  - 19 SHGs earned Rs 5.24 lakhs from vegetable cultivation
  - Kitchen utensils donated one SHG to run hotel business, 4 women are engaged in the business
  - Facilitated to form a group (named DARJI) of 10 to 15 trained girls engaged in cutting and stitching of cloths on market orders. They earned Rs. 0.72 lakhs
  - Donated an Electric Sewing Machine to a differently able women for tailoring business
- Adani Foundation celebrated International Women's Day where more than 100 women from peripheral villages actively participated.

#### *Vriksh Se Vikas-*

- 500 fruit (mango, guava, and jackfruit) tree saplings distributed to 100 women farmers for backyard plantation

#### *Adani Saksham-*

- 100 girls trained in tailoring skills, self-employed in tailoring business

#### *Kamdhenu-Dairy Development-*

- Project launched for cattle care and breed improvement to enhance productivity- Total 201 AI conducted through one LDC,
  - Organized 6 cattle health camps in which 578 cattle treated, and 160 farmers benefitted from 6 villages
  - 546 farmers from 12 villages attended in 13 training on improved livestock management
  - Distributed Fodder to 27 of farmers in 6 villages

### 4. Community Infrastructure Development:

- Constructed community centre at village Bade Bhandar and work at village Sarwani is under progress which will be completed by June'2023.
- Constructed community shed at village Kalma (Raw water pump house village).



## Main section

### 1.1 Education

**Project Utthan** launched by Adani Foundation in the month of January-2023 in Supa village, Pussore tahsil of Raigarh with objective of enhancing learning outcomes in elementary education and handhold the "Priya Vidyarthi's' (Progressive Learners). Block Education Office- Pussore, Dist. Raigarh consented for implementation of Project Utthan in 08 Government Schools.

Interventions under Project Utthan:

- Enhancing the teaching learning outcomes
- Empowering 'Priya Vidyarthi's' (Progressive Learners)
- Introducing English as a third language in class 1 to 4
- Arresting dropout rates
- Collaborating for teachers' capacity building
- Creating joyful learning spaces

Outreach of Utthan:

SL	School	Village	School Strength			Caste Category			
			Boys	Girls	Total	SC	ST	OBC	GEN/OTH
1	Primary School	Bade Bhandar	25	25	50	19	11	20	0
2	Primary School	Sarwani	31	31	62	5	53	4	0
3	Primary School	Amlibhouna	26	17	43	0	41	2	0
4	Primary School	Jevridih	14	19	33	8	8	17	0
5	Primary School	Supa	45	41	86	10	38	38	0
6	Middle School	Bade Bhandar	47	48	95	27	26	42	0
7	Middle School	Kathli	26	26	52	0	27	25	0
8	Middle School	Supa	58	46	104	41	30	33	0
<b>8 schools</b>		<b>7 villages</b>	<b>272</b>	<b>253</b>	<b>525</b>	<b>110</b>	<b>234</b>	<b>181</b>	<b>0</b>
<b>Percentage</b>			<b>52%</b>	<b>48%</b>	<b>100%</b>	<b>21%</b>	<b>45%</b>	<b>34%</b>	<b>0%</b>

Progressive Learners –Mainstreaming- 244 students Class 3 to 6:

No of School	Class 3 to 6	Baseline Assessment	Progressive Learners	Learning Levels of Students	Reading	Writing	Numeracy	Total
8	244	244	244	Level-0	15	17	13	45
				Level-1	36	65	61	162
				Level-2	64	99	69	232
				Level-3	104	60	84	248
				Level-4	25	3	17	45
<b>Total</b>	<b>244</b>	<b>224</b>	<b>244</b>	<b>Total</b>	<b>244</b>	<b>244</b>	<b>244</b>	

At the beginning of the project, a baseline assessment conducted to know the learning level of the students studying in class 3 to 6 from 8 Primary and Middle schools undertaken for Utthan Project.



100% students of Class 3 to 6 were covered in baseline assessment, data shows that all surveyed students 244 fall under progressive learner.

***Special Day Celebration in Govt School:***

Republic Day and Science Day celebrated under Project Utthan and covered 525 students of them 225 were progressive learners. Organized science fest, poster competition, science quiz on Science Day, it was observed that involvement of teachers increased in celebration of the activities and parents and stakeholder also actively participated in the day celebrations.



***Distribution of Sports and music instruments in Schools:***

Sports items and Music instruments provided in 08 nos. school for holistic development of school students under Utthan Project benefiting 525 students. This material assistance will allow the students to engage in various activities to build physical and mental abilities and create learning environment. Sports items like cricket kit, football, carrom board, ludo, chess, badminton etc. were distributed, similarly harmonium, tabla, drum set, mini keyboard etc. were distributed as music instruments.

### **Creating Joyful Learning Space:**

BaLA (Building and Learning Aid) painting is a very easy way to make students understand



the subject through pictures easily, do not need to memorize the subject. The main objective of this initiative is to raise interest in children by the means of entertainment and visual appeal. The BALA painting stimulates the curiosity among children to learn and remember easily. The BaLA painting done in 08 govt. schools. The colorful walls and pictorial learning method are attracting more children towards school than

before. Villager and panchayat representative is also appreciating this activity.

### **Adani Competitive Coaching Class:**

A free coaching class for preparation of Govt. job competitive examinations like CGPSC, CG Vyapam, Railway, Banking etc. started at Pussore in coordination with Janpad and block education department. The objective is to provide free coaching facilities to those local poor students who are unable to compete with others in various Govt job competitive entrance examinations due to lack of coaching institute in Pussore tehsil and inability to attend coaching facilities available at city due to poor economic conditions.



A written selection test conducted for admission in coaching class in which 290 students appeared out of which 35 students selected from 18 nearby villages of Pussore. Coaching classes is being run in the Mukhyamantri Yuva Kendra of Pussore in coordination with district administration and education department, in which rooms and other infrastructural facilities for coaching are being provided by the district administration. Qualified teachers teach 3 hours every day and conduct 2 practice tests every month to assess the knowledge of the students. Daily newspaper and competitive books are made available to the students for preparation of the examinations. Youth Day celebrated by the students of the coaching class. Collector Raigarh visited the center and appreciated efforts made by the Adani Foundation.

## Utthan Khel Kumbha:

### *Celebration of National Sports Day:*

National Sports Day is observed every year on 29th August. To encourage girls in sports and games, a 4 Km marathon organized for the girls from Bade Bhandar High School, about 100 schoolgirls from 04 villages enthusiastically participated in this event. The program was inaugurated by the Mr. Jeevan Lal Nayak, District Sports Officer-Raigarh in presence of panchayat representatives, school staffs, students, sports teachers, and villagers from peripheral villages.



### *Kabaddi Training:*



On International Girls' Child Day dated 11.10.2022 launched free Kabaddi training program for girls. The main objective of training program is train local girls to participate in district, state, and national level Kabaddi tournament, develop and encourage girl as a valuable player, sportsperson in the society. After pre- selection test out of 72, total 30 girls were selected from 06 different schools of 10 nearby villages. Total 42 Kabaddi training session organized, and 5 days self-defense training organized. Training provided by the state level kabaddi coaches. Total 10 girls from Kabaddi training program participated in the inter-state level Kabaddi tournament held at Milupara village of Tamnar block, Raigarh district from 13 to 17 January 2023 and in its very first attempt, they got 5th rank, won trophy and prize money. Three girls have been selected for district level Kabaddi tournament. The girls were also given training on First Aid from our OHC Doctor.

### Industrial Exposure visit:

Organized two power plant exposure visits for electrical, fitter and COPA trade from Government Industrial Training Institute (ITI) Sariya. Total 80 students visited power plant and get acquaintance with the power plant operation.

## 1.2 Community Health

### Mobile Healthcare Unit (MHU):

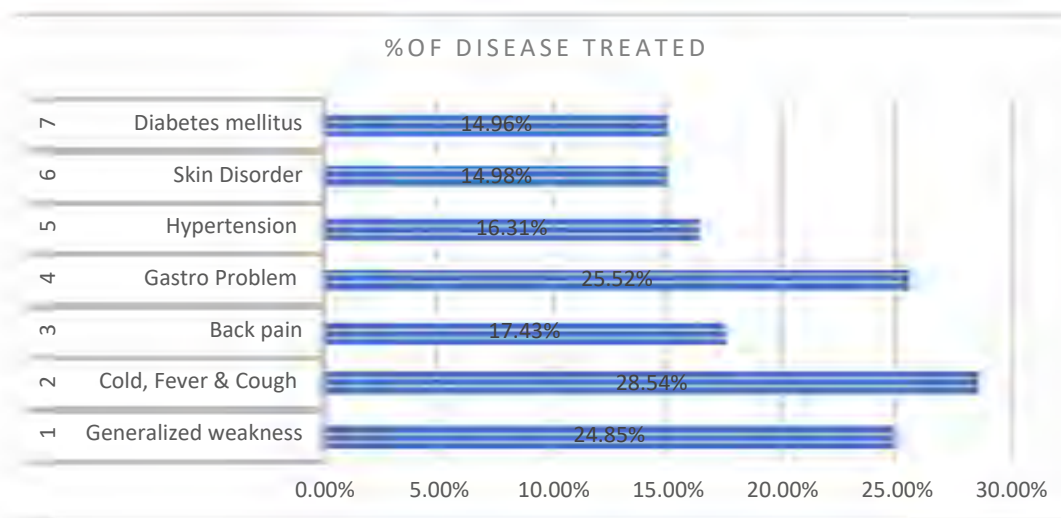
To provide quality health care services free of cost and promote preventive and curative services at the doorsteps of villagers is one of the objectives of the Mobile Healthcare Unit (MHU). The project is operational in 15 peripheral villages, visits villages on fixed schedule.

SL	Name of Villages	Total No. of Camps	Male	Female	Total
1	Bade Bhandar	51	569	693	1262
2	Chhote Bhandar	45	754	815	1569
3	Amlibhouna	52	449	453	902
4	Jevridih	45	400	657	1057
5	Sarwani	50	554	660	1214
6	Barpali	50	755	622	1377
7	Kathli	52	797	657	1454
8	Tupakdhar	52	250	328	578
9	Bunga	55	868	1174	2042
10	Ranbhatha	50	671	884	1555
11	Taparda	52	751	660	1411
12	Supa	25	415	430	845
13	Kotmara	26	412	302	714
14	Kalma	24	287	315	602
15	Chandli	26	287	322	609
	<b>Total</b>	<b>655</b>	<b>8219</b>	<b>8972</b>	<b>17191</b>



A Total 655 nos. of health camps organized in 15 villages through Mobile Healthcare Unit (MHCU) and in which total 17191 treatments conducted of them 8219 were male and 8972 were female to whom free medicines were distributed. Test for diabetes and blood pressure is also being conducted. Total 4082 new patients were registered during

this year. The project is implemented by HelpAge India. The MHCU team consists of 01 MBBS Doctor, 01 Pharmacist and 01 Social Protection Officer.



### *Awareness sessions for preventive healthcare:*

MHU team conducted total 114 awareness sessions during the village visit for health camp. The primary objective of these awareness sessions is to generate awareness among the community on various health issues like lifestyle diseases, skin, water born disease, care for COVID 19, Tuberculosis (TB), schemes run by the government and facilitate villagers to link with Ayushman Bharat Yojana etc. in which 2777 persons participated from 15 villages.

SL	Village Name	Total Awareness Session	Persons Participated
1	Bade Bhandar	8	199
2	Chhote Bhandar	7	218
3	Amlibhouna	11	217
4	Jevridih	9	185
5	Sarwani	10	237
6	Barpali	5	113
7	Kathli	6	170
8	Tupakdhar	7	97
9	Bunga	10	342
10	Ranbhatha	10	252
11	Taparda	7	183
12	Supa	4	120
13	Kotmara	6	108
14	Kalma	8	223
15	Chandli	6	113
<b>Total</b>		<b>114</b>	<b>2777</b>

### ***School Health and Awareness Camps:***

School health camps organized in 5 govt. schools for providing quality health care services to school students and to create awareness on cleanliness, personal health, and menstrual hygiene to adolescent girls of high and higher secondary school. Total 10 such camps organized where 811 students were benefitted with treatment to 276 students by our MHU team. This was appreciated by girl students, teachers, and parents.



### ***Important Days Celebration:*** **Observed Global Handwashing Day**



Observed Global Hand Washing Day on 15th October 2022 in five Government Schools. Created awareness on importance of cleanliness and washing of hand, demonstrated and taught steps of hand washing with soap and clean water. Total 259 students actively participated.

### **Observed Mother's Day**

Mother's Day was observed on dated 14th May 2022 at Bade

Bhandar village. Our MHU team organized event and provided information maternal and child health care, health checkup and counselling were conducted for pregnant and lactating mothers and made this day memorable with villagers. Total 35 mothers participated in the event.

### **Medical Camp:**

Organized free Medical Camp at Maa Chandrahasini Temple, Chandrapur from 25.09.2022 to 02.10.2022 during Navratri. A very big fair is being organized here every year on the eve of Navratri. It is also famous as a tourist place. During the festival of Navratri more than 1000 people per day visit the temple from nearby area and surrounding states. The people come from far places and wait for a day and two to visit and worship in the temple. It is observed and feedback received from the key stakeholders that many visitors need



attention for first aid medical services and treatment for common ailment like cough and fever and they are unserved.

During the camp free medical consultation, check-up, free medicines were distributed to the devotees and patients more than 1000 people were treated during the health camp.



### ***Swachhata Abhiyan:***

Swachhata Abhiyan Rally and clean drive held at Maa Chandrahasini Temple-Chandrapur. More than 200 students and teaching staff participated in the rally and clean drive to create awareness among the local people residing near the temple and devotees.

## **1.3 Sustainable Livelihood Development**

### **Kamdhenu- Dairy Development Project:**

The Kamdhenu- dairy Development Project launched on 22.10.2022, the following services provided through one Livestock Development Center (LDC) established at village Chhote Bhandar.

- Breed development by artificial insemination (AI)- conventional semen and sorted semen by trained AI technician, pregnancy diagnosis
- Training to farmers on cattle management-improved practices for rearing
- Veterinary camp and vaccination
- Fodder development- distribution of fodder for demonstration
- Awareness generation on animal husbandry

At the beginning of the project survey of cattle was conducted to know the cattle population, total 936 cattle found in 18 villages.

### ***Artificial insemination (AI):***

- Total 201 artificial inseminations were done in 18 peripheral villages, out of which 87 were sorted semen and 114 were conventional semen was done from November 2022 to March 2023.
- Pregnancy diagnosis conducted after three months of AI.



- The highest number of AI were done in village Bunga- 29(14.42%) followed by Chhote Bhandar- 25(12.43%) and Ranbhata- 21(10.44%).

SL	Name of Villages	Farmers Benefitted	Sorted Semen	Conventional Semen	Total No. of AI
1	Bade Bhandar	7	5	5	10
2	Chhote Bhandar	12	9	16	25
3	Amlibhouna	3	2	2	4
4	Jevridih	0	0	0	0
5	Sarwani	2	0	2	2
6	Barpali	6	3	5	8
7	Kathli	11	8	4	12
8	Tupakdhar	1	1	0	1
9	Bunga	21	14	15	29
10	Ranbhatha	14	11	10	21
11	Taparda	12	6	8	14
12	Supa	16	8	11	19
13	Kotmara	6	6	2	8
14	Kalma	11	6	6	12
15	Chandli	6	3	5	8
16	Amlipali	3	1	4	5
17	Sankarpali	13	3	11	14
18	Pusaldsa	5	1	8	9
<b>Total</b>		<b>149</b>	<b>87</b>	<b>114</b>	<b>201</b>

### *Livestock Management Training:*

To provide knowledge on improved livestock management- feeding, calf upkeeping, clean milk production and healthcare, total 13 training successfully organized in 12 villages. Total 546 farmers participated in the training.



### *Free Livestock Vet. Health camps:*

Veterinary health camps were organized in six villages namely Bade Bhandar, Ranbhata, Amlibhouna, Bunga, Supa and Pusalda village in which total 578 cattle were treated free of cost including deworming, sterilization and vaccination were done. Total 160 farmers were directly benefited from the camp.



**Fodder demonstration:**



To sensitize importance of fodder to increase productivity fodder named Hybrid Napier, Berseem and Cactus distributed to 27 farmers of six villages. Cropping done in total 1.44 acres. Berseem is known as the king of fodder because of the high content of protein (18-20%) similarly Napier contains crude protein 8-10%, crude fiber 26-28%, vitamin and minerals helps cattle

to produce more milk and remain healthy throughout their milking cycle.

**Wall Painting work:**

Wall painting done at identified public places in 15 villages for to create awareness among the farmers on the services provided by the LDC and points to remember for cattle rearing.



**Adani's Mahila Movement for Advancement(AMMA):**

**Vegetable Cultivation:**

Adani Foundation is continuously empowering women to improve their livelihood. Total 33 women members from 19 SHGs involved in vegetable cultivation through drip irrigation in total 3.50 acre of land of Supa, Barpali and Jevridih village.



Total 13 SHG; Supa (8SHG-17members) and Barpali (5SHG-8members) received 2.80 acres of land from village Gauthan Samiti free of cost for 3 years and started vegetable cultivation Tomato (variety- Saho) from November 2022 with support and guidance from Adani Foundation. Adani Foundation supported for supply and installation of drip irrigation system with mulching, land leveling, farm machinery, equipment's, manure,

fertilizers, pesticides, and improved seeds. They sold tomatoes of Rs 4.71 lakhs till March 2023; the crop is still in the field hence the amount will be more by end of the crop.

Similarly in village Jevridih (6SHG- 8member) are involved in cucumber cultivation through drip irrigation. They are working in 0.70-acre private land on lease from 1 farmer of Bade Bhandar village. They have sold cucumber of Rs. 0.53 lakhs till March 2023; the crop is still in the field hence the amount will be more by end of the crop.



*Govt. Contribution:* 55% Govt. subsidy received for supply and installation of drip irrigation under Pradhanmantri Krishi Sinchayi Yojna.

*Community Contribution:* 40% towards their labour, manure, staking materials, pump maintenance, electricity etc.

### ***Mushroom Farming:***



Total 69 women from 15 self-help groups of 7 villages of Chhote Bhandar, Jevridih, Amlibhouna, Bunga, Taparda, Kathli and Supa were given two-day training in 03 batches for production of paddy straw and oyster mushroom as an adoption of alternate livelihood.

Adani Foundation provided spawn, raw material, mushroom packaging, and machine to those groups for mushroom production as well as provided technical guidance. 10 SHGs started paddy straw mushroom production and sold mushroom of Rs.39,731.00 by producing 163.50 kg of paddy straw mushroom. Similarly, 15 SHGs sold mushroom of Rs. 84,830.00 by producing 787 Kg oyster mushrooms. These groups sold mushroom of total Rs 1.30 lakhs from mushroom farming.

Adani Foundation provided spawn, raw material, mushroom

*Community Contribution:* 30% contributed from the project participants.

### ***Exposure Visit:***

A one-day on 21st Feb 2023 exposure visit organized for the members of women SHGs. Total 28 women members from 14 SHG from 07 villages visited to Jai Hanuman Mushroom Centre-Sariya, District-Shakti.



During the visit they got opportunities to understand and learn systems of mushroom production, key points to remember during cultivation, marking of mushroom, record keeping etc.

### *Promoting Women Led Business:*



Under the sustainable livelihood development material support extended for strengthening and expanding business of 05 women entrepreneurs from 02 villages of Ranbhata and Chandli. Provide material support for kitchen and furniture items to Sarswati SHG for expansion of hotel business in Ranbhata village. Total 04 members involved in hotel business. Sarswati

SHG started business from small savings of Rs. 600.00. Similarly, one electric sewing machine given to Ms. Lilandari Nishad of Chandli village. Her both leg is affected from polio since childhood. She completed tailoring course from ASDC -Bade Bhandar and after completion of training, started tailor shop at her home and earn of Rs. 2000-5000 per month. Acknowledging her dedication and motivation, Adani Foundation provided one electric sewing machine to make her work ease and stitch more cloths with less effort and to increase her monthly income to 10,000 per month.



### *Darji Project:*



An effort made to form a group of 10 to 15 girls who have received tailor training start group business by taking order from individual and market. Adani foundation helped in providing basic infrastructure support like sewing machine, room for their production unit and provided help in purchasing of raw materials, marketing and product selling. At present team was expert on making in Salwar Suit,

Designer Blouse, Petticoat, Gown, Mask, School Bag, Mobile Carry Bag, Travel Bag, Shirt Paint etc. and stitched total of Rs. 0.72 lakhs till March 2023.

### *International Women's Day organized at Supa*

On the eve of International Women's Day, an event organized at village Supa on 6th March. The theme for International Women's Day 2023 was "DigitALL: Innovation and technology



for gender equality," The theme aims to recognize the contribution of girls and women in the field of technology and online education and to increase their access to digital technologies and online facilities for women and girls. Program organized in coordination with Bihan (SRLM) Pussore. Various activities like balloon blast, mask and candle

competition were organized to encourage women. ASDC students performed Chhattisgarhi Folk dance. Women were honored by giving memento for their contribution. Stall was also set up for the exhibition and sale of products manufactured by self-help groups. In which SHG members and students of ASDC displayed and sold their manufactured products like - organic rice, homemade snacks items, herbal gulal and different types of bags, purse, travel bags etc. More than 200 Women actively participated in the event.

### *Govt. program Linkage:*



Organized Govt Scheme awareness sessions in villages, facilitated to benefit three farmers of village Bade Bhandar, Jevridih and Amlibhouna under ATMA program of Agriculture Department for promotion of Paddy cultivation using SRI method (Variety Chhattisgarh Devbhog) where each farmer got 15 Kg of paddy seed for

cultivation. Adani Foundation continuously provide technical guidance and helped to get machines and equipment to the farmers at different stages from Govt. Agri. Dept. Whereby simple method paddy yields to 18 quintals per acre, with this method the average yield was 20 to 22 quintals in one acre. Total 38 quintal rice produced from 1.50 acre of 3 farmers through SRI method.

### Chhattisgarh Rajya Utsav:

November 1st of every year is celebrated as Chhattisgarh Rajya Utsava (Chhattisgarh Foundation Day) by the District Administration. This festival serves as the ideal platform for exhibitors to generate outstanding sales and services in diverse categories like Electronics, Computers and Software, Automobiles, Décor, Beauty, Real Estate, Healthcare, Communications & IT, Banking & Insurance, Educational Institutions, FMCG Companies, States, Industrial houses, Mining equipment manufacturers, Handicraft etc. In Rajyotsava festival, famous folk artists of Chhattisgarh and school students present traditional Sua dance, Panthi dance, Karma dance, and other dance forms. During the event our SHG members displayed and sold their products like - organic rice, pulse, wafer, soft toys, herbal rangoli color, desi Ghee, Bati and similarly Darji team sold their product like school bag, travel bag, petticoat, mobile purse etc. earned of Rs. 5000 from this event.



### Vriksh Se Vikas:



500 fruit tree saplings planted by 100 SHG members in their backyard. Observed World Environment Day on 5th June, SHG members and panchayat representative, health workers from Gram Panchayat Barpali and Chandli actively participated in the event and planted trees in common land and sensitized community by taking rally in the village.

Similarly, at ITI Saria, a rally was organized by the students on this day to create awareness among the people about the environment. On this occasion various activities organized on and total 625 tree saplings planted.

## 1.4 Community Infrastructure Development:

### Construction of community Center:

#### **Bade Bhandar village-**

In Bade Bhandar, the villagers organize their social, cultural programs and gatherings throughout the year. Since no other community center was available in the village, there were problems in organizing public level programs. The balance work of community center constructed for community use to perform various social and religious programs and activities the area of the center is 12.0m X 6.10m.



#### **Sarwani village-**

Adani foundation took up work to complete balance work of community center at village Sarwani. The construction work is under progress shall be completed by June 2023. The area of the center is 15.500m X 6.50m. Around 460 people of Sarwani can take benefit of the center. The center can be utilized for organizing social functions, meeting, and training programs etc.

#### **Kalma village-**

Kalma village is situated on the bank of Mahanadi River. During the heavy rains and floods conditions, water accumulates in many places of the Kalma village. Gram Panchayat requested for the construction of one community shed at Oraon basti as a safe place during floods and rainy season. Community shed work took place on 21.0m X 6,60m area. The place will also be used for social function, community meeting etc.



## 1.5 Special Programs-

### Adani Saksham

Girls and women living in the peripheries of plant are deprived of opportunities to be engaged in gainful employment and financial independence. They lack employable skills due to lack of skill building institutions in nearby area and support systems for skill development. Lack of awareness equipped with low levels of knowledge is also identified as one of the root causes of the existing situation. Tailoring is age old professions and liked most by the girls and women. With this, self-employed tailor (SET) course started

through Adani Saksham. 100 girls trained in cutting and stitching of the cloths from 17 peripheral villages. Many of them are self-employed and working from their home. This is the three months course, during the course many extra-curricular activities were organized to keep them motivated and overall personality development.

SL	Gram Panchayat	Village Name	Total Students
1	Bade Bhandar	Bade Bhandar	6
2	Chhote Bhandar	Jevridih	2
3	Ranbhatha	Ranbhatha	4
4	Bunga	Bunga	15
5	Chandli	Chandli	14
6	Taparda	Kathli	1
7	Barpali	Barpali	4
8	Taparda	Taparda	12
9	Supa	Supa	10
10	Bonda	Bonda	14
11	Bonda	Siladi	4
12	Supa	Thengagudi	3
13	Nawapara (B)	Raipali	1
14	Tetla	Tetla	5
15	Kensara	Kensara	2
16	Badimal	Badimal	2
17	Baradoli	Baradoli	1
<b>Total</b>			<b>100</b>





## 1.6 Case stories:



**Mr. Sham Lal Manhar**, 66, lives in Taparda. He was suffering from many health problems like throat pain and neck swelling since last two years. Unfortunately, he had to travel all the way to Raigarh for treatment. Belonging to a BPL family, payment for doctors, medicines and transport was very expensive for him. He couldn't afford to get regular medical treatment and hence, his condition was undiagnosed, and treatment was delayed.

When he came to know about the Mobile Health Care Unit (MHCU) in April 2022, his life changed. With free medical advice and medicine at his doorstep for last one year, he is now fit and healthy.

MHCU has transformed the lives of many individuals like Mr. Sham Lal. There have been more than 17,000 treatments and the numbers are rising each month.

**Mrs. Sandhya Sao**, 35, lives in Bunga with her family of 7 member. Her husband, a farmer,



is the prime source of income to her two daughters and in-laws. Her aspiration to become self-reliant and financially independent led her to Mushroom farming training program offered by Adani Foundation. This two-day training program helped Mrs. Sandhya to learn the nuances of mushroom production and gain expertise in this area. Using her knowledge, she was able to produce 145 kilograms of mushroom at her home which helped her earn Rs 24066/-. Her desire of being financially independent is now fulfilled, and she is an inspiration for other women in the village. With her earning supporting her child for better education.



**Lilandari Nishad**, 40, lives with her family of 17 members in Chandli, a village near REGL. She is the youngest in her family of 4 sisters and 2 brothers. Unfortunately, in her childhood, she contracted polio which disabled her left leg. Lilandari belongs to a BPL family. She lost her father 3 years ago, and now, the only source of income is her elder brother who is a farmer. With a single bread earner, the family could hardly cover their daily expenses.

Because of her disabled leg since childhood and inability to complete her higher education due to financial constraints, Lilandari suffered a lot.

However, her will power and passion to help her family and carve out a unique identity led her to complete a three-month Self-Employed Tailoring (SET) course offered by Adani Skill Development Center. Post this course, she did not only open her own shop at her home but also trained 10 girls in her village free of cost. Her perseverance and courage to pursue her dreams helped her to earn Rs 2000/- to Rs 5000/- per month using the skills learnt from the training.

Later under SLD program, she was given an electric sewing machine to aid to her income and art of sewing. As said by the Sarpanch Mrs. Sushila Nishad of Chandli, Lilandari is a true role model for many girls. Inspired by her, girls aspire and go to receive training from Adani Skill Development center, Bade Bandar and become financially independent.

1.7 Media coverage:

**अदाणी फाउंडेशन ने शुरू किया प्रोजेक्ट 'उत्थान'**

युवाओं की रोजगार सृष्टि को गिरावट दिखाने के समक्ष राष्ट्रीय शिक्षण को मिलेगी गति



अदाणी फाउंडेशन ने 'उत्थान' नामक एक नए प्रोजेक्ट शुरू किया है। यह प्रोजेक्ट युवाओं की रोजगार सृष्टि को गिरावट दिखाने के समक्ष राष्ट्रीय शिक्षण को मिलेगी गति। अदाणी फाउंडेशन के अध्यक्ष अशोक अदाणी ने इस प्रोजेक्ट का शुभारंभ किया।

**राष्ट्रीय विज्ञान दिवस पर अदाणी फाउंडेशन ने आयोजित किए कई कार्यक्रम**

आयोजित, सत्रावली, बड़े मंच पर, जेम्स जेम्स, युवा में विज्ञान प्रदर्शनी, बड़े मंच पर, युवा और बच्चों के विज्ञान प्रदर्शनी का आयोजन



अदाणी फाउंडेशन ने राष्ट्रीय विज्ञान दिवस के अवसर पर अनेक कार्यक्रम आयोजित किए। इनमें बच्चों के लिए विज्ञान प्रदर्शनी, युवाओं के लिए सत्रावली, बड़े मंच पर कार्यक्रम, जेम्स जेम्स, युवा में विज्ञान प्रदर्शनी, बड़े मंच पर, युवा और बच्चों के विज्ञान प्रदर्शनी का आयोजन शामिल है।

**अदाणी फाउंडेशन द्वारा राष्ट्रीय युवा दिवस का पुसौर में भव्य आयोजन**

अदाणी फाउंडेशन द्वारा राष्ट्रीय युवा दिवस का पुसौर में भव्य आयोजन किया गया। कार्यक्रम में युवाओं को प्रेरित करने के लिए अनेक कार्यक्रम आयोजित किए गए। अदाणी फाउंडेशन के अध्यक्ष अशोक अदाणी ने इस कार्यक्रम का शुभारंभ किया।



युवा दिवस का आयोजन पुसौर में अदाणी फाउंडेशन द्वारा किया गया। कार्यक्रम में युवाओं को प्रेरित करने के लिए अनेक कार्यक्रम आयोजित किए गए। अदाणी फाउंडेशन के अध्यक्ष अशोक अदाणी ने इस कार्यक्रम का शुभारंभ किया।

**अदाणी फाउंडेशन ने किया अंतर्राष्ट्रीय दिवस योग पर योग का आयोजन**



अदाणी फाउंडेशन ने अंतर्राष्ट्रीय दिवस योग पर योग का आयोजन किया। कार्यक्रम में योगियों को प्रेरित करने के लिए अनेक कार्यक्रम आयोजित किए गए। अदाणी फाउंडेशन के अध्यक्ष अशोक अदाणी ने इस कार्यक्रम का शुभारंभ किया।

**युवाओं को व्यावसायिक प्रतियोगी परीक्षाओं की तैयारी कराने अदाणी फाउंडेशन का नि:शुल्क कोचिंग केंद्र शुरु**

अदाणी फाउंडेशन द्वारा युवाओं को व्यावसायिक प्रतियोगी परीक्षाओं की तैयारी कराने के लिए नि:शुल्क कोचिंग केंद्र शुरु किया गया। कार्यक्रम में युवाओं को प्रेरित करने के लिए अनेक कार्यक्रम आयोजित किए गए। अदाणी फाउंडेशन के अध्यक्ष अशोक अदाणी ने इस कार्यक्रम का शुभारंभ किया।



अदाणी फाउंडेशन द्वारा युवाओं को व्यावसायिक प्रतियोगी परीक्षाओं की तैयारी कराने के लिए नि:शुल्क कोचिंग केंद्र शुरु किया गया। कार्यक्रम में युवाओं को प्रेरित करने के लिए अनेक कार्यक्रम आयोजित किए गए। अदाणी फाउंडेशन के अध्यक्ष अशोक अदाणी ने इस कार्यक्रम का शुभारंभ किया।

**आजादी का अमृत महोत्सव: हर घर तिरंगा अभियान पर अदाणी फाउंडेशन ने वितरित किये 2500 से अधिक राष्ट्रीय ध्वज**



अदाणी फाउंडेशन द्वारा आजादी का अमृत महोत्सव के अवसर पर हर घर तिरंगा अभियान पर अनेक राष्ट्रीय ध्वज वितरित किए गए। कार्यक्रम में युवाओं को प्रेरित करने के लिए अनेक कार्यक्रम आयोजित किए गए। अदाणी फाउंडेशन के अध्यक्ष अशोक अदाणी ने इस कार्यक्रम का शुभारंभ किया।



## 1.8 Appreciation letter from stakeholder(s)



## 1.9 Beneficiaries count:

SL	Activity Description	Direct	Indirect	Access
<b>A. Education</b>				
1	Adani Competitive Coaching Centre	35	140	
3	Project Utthan	244	976	
4	Utthan Khel Kumbh- Girls' Kabaddi Training	30	120	
<b>B. Community Health</b>				
1	Mobile Healthcare Unit	10554		4444
2	Medical Camp	1020		4080
<b>C. Sustainable Livelihood Development</b>				
1	Adani Mahila Movement for Advancement	112	448	238
2	Kamdhenu- Dairy Development project	779	415	
<b>D. Community Infrastructure Development</b>				
1	Community Centre at Bade Bhandar			1198
2	Construction of Community Centre at Sarwani			460
3	Construction of Community Shed at Kalma			1180

\* Refer attachments:

- Guidance on Calculation of Beneficiaries of AF CSR Projects
- FAQ-Beneficiaries Count

## Site CSR team

<b>SL</b>	<b>Name</b>	<b>Position</b>
1.	Purnendu Kumar	Head CSR - REGL
2.	Vivek Pandey	Senior Project Officer - AF
3.	Parmeshwar Gupta	Senior Assistant - REGL
4.	Nilesh Kumar Mahana	Community Mobiliser - AF
5.	Somprabha Goswami	Community Mobiliser - AF



Site office address:

Raigarh Energy Generation Limited  
Village- Chhote Bhandar, Post- Bade Bhandar  
Tehsil- Pussore, District-Raigarh  
Pin Code- 496100 (Chhattisgarh)



# Green Belt Development

Plantation on 36% land of 487 acre	167acre	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	267000 Nos.	
2022-23	20026 Nos.	
2023-24	1000 Nos.	
Survival rate maintained	< 70%	

Ash Generation and Utilization Details (April 2022 to March 2023)							
Month	Ash Generation (MT)	Ash Utilization				Total Ash Utilization	% age Utilization
		Brick Plant (MT)	Cement Industries (MT)	Filling of low-lying area (MT)	Ash dyke raising construction (MT)		
APRIL-2022	110843.55	0.0	0.0	3095.00	96775.00	99870.00	90.10
MAY-2022	104508.66	0.0	0.0	74913.00	6824.00	81737.00	78.21
JUNE-2022	105049.10	0.0	0.0	23575.00	10500.00	34075.00	32.44
JULY-2022	92844.92	0.0	0.0	29730.00	0.0	29730.00	32.02
AUGUST-2022	39202.61	0.0	0.0	11189.76	0.0	11189.76	28.54
SEPTEMBER-2022	118630.10	0.0	0.0	49869.78	0.0	49869.78	42.04
OCTOBER-2022	132447.26	0.0	0.0	41021.21	0.0	41021.21	30.97
NOVEMBER-2022	100688.98	0.0	1000.00	111046.80	0.0	112046.80	111.28
DECEMBER-2022	112067.02	0.0	2511.00	159431.38	0.00	161942.38	144.50
JANUARY-2023	77350.67	0.0	2076.52	270852.98	17678.00	290607.50	375.70
FEBRUARY-2023	123467.06	0.0	0.0	164654.50	0.0	164654.50	133.36
MARCH-2023	129203.17	16000.0	0.0	205222.74	0.0	221222.74	171.22
<b>Total</b>	<b>1246303.10</b>	<b>16000.0</b>	<b>5587.520</b>	<b>1144602.15</b>	<b>131777.000</b>	<b>1297966.67</b>	<b>104.15</b>

भारत सरकार  
परमाणु ऊर्जा विभाग  
विकिरण एवं आइसोटोप प्रौद्योगिकी बोर्ड



Government of India  
Department of Atomic Energy  
Board of Radiation & Isotope Technology

Certificate Tracking ID / CTID : 2305262  
Date of Issue / DOI : 23-Mar-2023  
Certificate Serial No. / CSN : ULR-TC666523000003474P



TC-6665



### RADIOACTIVITY TEST CERTIFICATE

Ref : BRIT/RAL/DOM/1162-1167/MISC/877-882/22-23

To :  
M/S. RAIGARH ENERGY GENERATION LIMITED (ADANI POWER LTD)  
VILLAGE CHOTE BHANDAR  
P O BADE BHANDAR  
RAIGARH 496100  
C.G

This is regarding the samples of "COAL, FLY ASH AND POND ASH/BOTTOM ASH" sent for radioactivity analysis vide your letter dt. 01.02.2022 which as per above letter is drawn from consignment with the following markings, as shown in italics:

**SAMPLE DESCRIPTION** : **COAL, FLY ASH AND POND ASH/BOTTOM ASH**

Sr. No	SAMPLE NO.	TYPE OF SAMPLE	PLACE	DATE OF SAMPLE
1	SAMPLE #1	COAL SAMPLE	ADANI, RAIGARH	01.02.2023
2	SAMPLE #2	FLY ASH SAMPLE	ADANI, RAIGARH	01.02.2023
3	SAMPLE# 3	POND/BOTTOM ASH SAMPLE	ADANI, RAIGARH	01.02.2023

DATE OF RECEIPT OF SAMPLE: 02.02.2023

DATE OF COMPLETION OF TEST: 21.02.2023

The Samples provided were analysed for U-238 and Th-232 radioactivity content by HPGe gamma spectrometry and the values obtained are as follows :

Sr. No	TYPE OF SAMPLE	U-238 (Bq/Kg)	Th-232 (Bq/Kg)
1	COAL SAMPLE	32 ± 1.4	38.2 ± 5.3
2	FLY ASH SAMPLE	82.3 ± 2.8	116.3 ± 11.1
3	POND/BOTTOM ASH SAMPLE	76.4 ± 3.3	99.4 ± 10.3

Opinion: The measurement values are below the clearance level for radionuclides of natural origin in bulk solid materials, as per AERB directive 01/2010 (table-3) dated 26/11/2010

Note: (i) The report pertains to the given sample only. (ii) The sample will be retained in this laboratory for a period of 1 month from certificate date and thereafter it will be disposed off. (iii) This report shall not be reproduced except in full, without written approval of the laboratory. (iv) The sampling is not done by this laboratory.

**Checked by:**  
SHEEBA S.W.  
Assistant

**Authorized Signatory:**  
AJAY NANA THAMKE  
OIC, RAL

\*\*\*\*\* End of Report \*\*\*\*\*

The authenticity of this certificate is verifiable. Please scan the QR code using a QR scanning application on any mobile devices. Upon redirection you must enter the necessary information in landing page <https://portal.britatom.gov.in>. We will then revert you back with a digital copy of the certificate in your verified e-mail ID. In accordance to IT Act 2000 (21 of 2000), this document is generated electronically through a validated s/w and need no physical/ digital signature(s).



विआप्रौबो/ बीएआरसी परिसर, सेक्टर २०, वाशी, नवी मुंबई - ४०० ७०३ (महाराष्ट्र)  
BRIT/ BARC Vashi Complex, Sector 20, Navi Mumbai - 400 703 (Maharashtra)

वेबसाइट/ Website: [www.britatom.gov.in](http://www.britatom.gov.in); दूरभाष/ 022 2788 7002/ 7006

